

Environmental Assessment and Review Framework

Document Stage: Draft
Project Number: 53067-004
January 2021

IND: Inclusive, Resilient and Sustainable Housing for Urban Poor Sector Project in Tamil Nadu

Prepared by the Tamil Nadu Slum Clearance Board for the Asian Development Bank.

This environmental assessment and review framework is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature. Your attention is directed to the "terms of use" section on ADB's website.

In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, ADB does not intend to make any judgments as to the legal or other status of any territory or area.

CURRENCY EQUIVALENTS

(as of March 2019)

Currency Unit	–	Indian rupee (₹)
₹1.00	=	\$0.01498
\$1.00	=	₹66.7720

ABBREVIATIONS

ADB	– Asian Development Bank
CB	– Community Based Organization
CLS	– Core Labor Standards
C-EMP	– Construction Environmental Management Plan
CTE	– Consent to Establish
CTO	– Consent to Operate
CPCB	– Central Pollution Control Board
CMDA	– Chennai Metropolitan Development Authority
CRVA	– Climate Risk and Vulnerability Assessment
D-EMP	– Demolition Works Environmental Management Plan
DTCP	– Directorate of Town and Country Planning
EA	– Executing Agency
EARF	– Environmental Assessment and Review Framework
EIA	– Environmental Impact Assessment
EHS	– Environmental, Health and Safety
EMP	– Environmental Management Plan
ESMS	– Environmental and Social Management System
EPC	– Engineering, Procurement and Construction
ERP	– Emergency Response Plan
ESA	– Environmentally Sensitive Area
EWS	– Economically Weaker Section
FGD	– Focus Group Discussion
GHG	– Green House Gas
GOI	– Government of India
GRM	– Grievance Redress Mechanism
IA	– Implementing Agency
HUDD	– Housing and Urban Development Department
IFC	– International Finance Corporation
ILO	– International Labor Organization
IOL	– Inventory of Losses
IP	– Indigenous People
LIG	– Low Income Group
MOEFCC	– Ministry of Environment, Forests and Climate Change
MSDS	– Material Safety Data Sheet
NABET	– National Accreditation Board for Education and Training
NABL	– National Accreditation Board for Testing and Calibration Laboratories
NGO	– Non-governmental Organization
O&M	– Operation and Maintenance

PIAL	– Prohibited Investment Activities List
PCB	– Polychlorinated Biphenyl
PCR	– Physical Cultural Resources
PIB	– Project Information Brochure / Booklet
PIC	– Project Implementation Unit Circle
PID	– Project Implementation Division
PPE	– Personal Protective Equipment
PMU	– Project Management Unit
PPP	– Public Private Partnership
PWD	– Public Works Department
QPR	– Quarterly Progress Reports
REA	– Rapid Environmental Assessment
R-EMP	– Regeneration Works Environmental Management Plan
RF	– Resettlement Framework
ROW	– Right of Way
RWA	– Resident Welfare Association
SEIAA	– State Environmental Impact Assessment Authority
SES	– Social Economic Survey
SH	– Seoul Housing and Communities Corporation
SPCB	– State Pollution Control Board
SOMP	– Standard Operation & Maintenance Plan
TOR	– Terms of Reference
TNSCB	– Tamil Nadu Slum Clearance Board
TNIFMC	– Tamil Nadu Infrastructure Fund Management Corporation
ULB	– Urban Local Body
WBG	– World Bank Group
WHO	– World Health Organization

NOTE

In this report, "\$" refers to United States dollars.

CONTENTS

	Pages
I. INTRODUCTION	1
A. Project Background	1
B. Project Rationale	1
C. Scope of Work Under Output 1	3
D. Purpose of Environmental Assessment and Review Framework	4
E. Project Categorization	6
F. Environmental Due Diligence of Sample Subprojects	12
II. ASSESSMENT OF LEGAL FRAMEWORK AND INSTITUTIONAL CAPACITY	16
A. ADB Safeguards Policy Statement 2009 Requirements	16
B. National Policy and Environmental Regulatory Requirements	21
C. Comparison of ADB SPS, 2009 Policy and National Environmental Regulatory Requirements	39
D. Applicable International Standards and Best Practices	46
E. International Agreements	51
F. Institutional Capacity	57
III. ANTICIPATED ENVIRONMENTAL IMPACTS	62
A. Project Benefits	62
B. Potential Adverse Impacts	62
IV. ENVIRONMENTAL ASSESSMENT PROCESS TO BE FOLLOWED FOR SUBPROJECTS	63
A. Environment Category	63
B. Selection of Subprojects as per Guidelines	63
C. Environmental Assessment Process for Each Subproject	63
D. Monitoring and Reporting	68
V. PUBLIC CONSULTATIONS, INFORMATION DISCLOSURE, AND GRIEVANCE REDRESS MECHANISM	68
A. Consultation and Participation	68
B. Information Disclosure	69
C. Grievance Redress Mechanism	70
VI. INSTITUTIONAL ARRANGEMENTS AND RESPONSIBILITIES	74
A. Roles and Responsibilities	74
B. Capacity Building	84
C. Implementation Schedule	87
D. Staffing Requirements and Cost Estimates	87

APPENDICES

1. Template for Subproject Selection Output 1
2. Site visit Report Output 1
3. Anticipated Environmental Impacts Table Output 1
4. Rapid Environmental Assessment(REA) Checklist Urban Development
5. No Mitigation Scenario (Scoping) Checklist
6. Initial Environmental Examination Outline
7. Project Data Sheet - Information Disclosure Template
8. Grievance Registration Form Template
9. Daily Monitoring Sheet for Contractors Template
10. Quarterly Monitoring Template
- 11.1. Terms of Reference – Environmental Consultant
- 11.2. Terms of Reference – Asbestos Expert
12. Standards for Sewage Treatment Plants (STPs)
13. CPCB Guidelines for Reuse of Treated Effluent and Sludge from STP
14. Environmental, Health and Safety Audit - Template

I. INTRODUCTION

A. Project Background

1. The project is intended to finance series of investments via a USD 215 million sector loan in various cities of Tamil Nadu in South India. The project covers three (3) outputs. The Government of Tamil Nadu through the Housing and Urban Development Department (HUDD) will be the executing agency (EA) and responsible for overall project management and compliance with loan assurances. The Tamil Nadu Slum Clearance Board (TNSCB)¹, Tamil Nadu Infrastructure Fund Management Corporation Limited (TNIFMC)², and Directorate of Town and Country Planning (DTCP)³ will be the implementing agencies (IAs) for the outputs under the sector loan.

2. Recent weather events such as severe flooding in Tamil Nadu has highlighted the extreme vulnerability of low-income households and their livelihood. The State's high risk for climate-related disasters makes the slums extremely vulnerable to intense rainfall and recurrent flooding given their encroachment on natural drains, which are prone to overflow during heavy rainfall. Tamil Nadu's population living in slums amounts to 5.8 million, representing 16.6 percent of the State's urban population. The State faces a housing shortage in urban areas of around 1.25 million units.⁴ Based on a recent demand survey, there are 1.39 million registered applications requesting affordable housing units in Tamil Nadu under PMAY-HFA (U)⁵, of which about 625,368 have been approved. The Government of Tamil Nadu is committed to addressing the State's urban housing deficit, especially for the economically weaker section (EWS) and lower income group (LIG) population. The Government of Tamil Nadu's "Vision 2023"⁶ sets out the provision of housing with infrastructure for all urban slum families in Tamil Nadu and the creation of a slum free State by 2023.

3. Given the flooding risks and the "Vision 2023", the Government of Tamil Nadu has requested support from ADB for: (i) relocation and rehabilitation of households living in extremely vulnerable and high-risk areas in cities in Tamil Nadu; (ii) development and implementation of a housing model for industrial workforce; (iii) piloting new models of affordable housing; and (iv) regional planning. The project will also support innovation and enhance institutional capacity of the EA and IAs. The sector loan will be implemented during May 2021 – April 2028.

B. Project Rationale

4. The project rationale in terms of Impact, Outcome and Outputs is provided in Table 1.1.

Table 1.1. Project Impact, Outcome and Outputs

Impact	Permanent shelter with appropriate housing infrastructures and services for every affected household ⁷
Outcome	More inclusive and accessible urban services and infrastructures for vulnerable

¹<http://www.tnscb.org/>

²<http://www.tnifmc.com/>

³<https://www.tn.gov.in/tcp/>

⁴ Report of the Technical Group on Urban Housing Shortage, 2012-2017.

⁵ Government of India, Ministry of Housing and Urban Poverty Alleviation (MHUPA). 2016. Pradhan Mantri Awas Yojana – Housing for All (Urban) Scheme Guidelines (PMAY-HFA (U)). New Delhi.

⁶ "Vision Tamil Nadu 2023: Strategic Plan for Infrastructure Development in Tamil Nadu." Government of Tamil Nadu.

⁷ Government of India, Ministry of Housing and Urban Poverty Alleviation (MHUPA). 2016. Pradhan Mantri Awas Yojana – Housing for All (Urban) Scheme Guidelines (PMAY-HFA (U)). New Delhi.

	and disadvantaged communities, especially those from Economically Weaker Section (EWS) and Low-IncomeGroup (LIG)
Output 1	Affordable housing for vulnerable communities
Output 2	Affordable Housing for urban poor and migrant workers
Output 3	Regional planning

5. Output 1: Affordable Housing for Vulnerable Communities. The project will support the resettlement of slum households in vulnerable waterways/waterbodies to safe relocation sites. The project will work with government to introduce gradual changes in the delivery of affordable housing to the urban poor through: (i) improved design including operation and maintenance (O&M), (ii) increased beneficiary consultation and participation, and (ii) a graduation approach to sustain vulnerable relocated households.⁸ The output will include protection of cleared waterways to restore ecological functions and prevent re-encroachment.⁹ TNSCB will be the IA for this output and an EARF (this document) will provide a guide to be followed for subprojects that are prepared under output 1.

6. Output2: Affordable Housing for Urban Poor and Migrant Workers. The project will support the government's Shelter Fund through a public-private partnership structure, which will provide industrial housing and working women's hostels for low-income and migrant workers. TNIFMC will be the IA for this output and an Environmental and Social Management System (ESMS) will be followed for subprojects that are prepared under output 2.¹⁰

7. Output 3: Regional Planning. The project will support regional planning that integrates existing and proposed development plans and makes provisions for affordable housing based on regional disparities in correlation with infrastructure development, environmental protection, and disaster risk management.¹¹ DTCP will be the IA for output 3.

⁸ The graduation approach is a holistic, time-bound, and carefully sequenced set of interventions to place households on an upward trajectory from poverty. This includes four key components: (i) social assistance to support immediate needs such as subsistence and health services during transition in the relocation site; (ii) livelihood promotion through localized market assessment and household-level enterprise/employment matching; (iii) financial inclusion through financial literacy and improving access to savings and financial services to promote economic resilience; and (iv) social empowerment by improving social dynamics, including gender relations, in the families and communities.

⁹ Removing encroachments in waterways will have the benefit of restoring capacity to absorb water and reduce future flooding, recharge groundwater, and potentially be alternative sources of water in water-scarce areas. Regeneration of urban areas can also result from creating public spaces. Impacts of investing in the subsector can be further increased by improving TNSCB's design and implementation practices and policies, and further strengthening the institution.

¹⁰ During ADB Mission to Tamil Nadu in September 2019, the Mission discussed with TNIFMC on ADB's ESMS requirements, and the potential to use the World Bank's ESG Framework that has been adopted for the WBG funded **Tamil Nadu Housing and Habitat Development Project**. The ESMS will address any identified gaps between the ESG and the ESMS requirements of ADB Safeguard Policy Statement (SPS) 2009. The Mission explained that an ESMS agreed between TNIFMC and ADB, and approved by TNIFMC is a condition for any disbursement for output 2.

¹¹ The increasing gap in housing supply has resulted in the proliferation of slums and unorganized real estate across the landscape. The availability of affordable housing in proximity of mass transit system and linked job distribution has become severely imbalanced with rapid regional urbanization and growing population density. Large scale urban developments are becoming increasingly difficult due to lack of land parcels, congested transit routes, lack of finance, rising input costs and regulatory hurdles. The housing shortage is more prominent within the EWS (economically weaker sections) and LIG (lower income groups). Policy measures are in place both at national and state level, in order to regularize development in this sector. But the gap is huge and some innovative solutions needs to be examined. The Regional Approach to planning can be an instrument for meaningfully disaggregating the national policy and programs and its sectoral components into comprehensive regional plans, that will provide coherence to local plans, programs and projects within a comprehensive regional development framework and identify new growth poles in strategic locations of underdeveloped regions.

C. Scope of Work Under Output 1

8. Subproject Scope. The scope of work under each subproject will consist of:

- (i) Construction of new development / resettlement sites
- (a) Construction of new buildings for housing and other uses (ration shops, creche or Anganwadi, etc.)
 - (b) Allocation of open space reservation (OSR) equivalent to 10 percent of total area at a resettlement site; and additional 15 percent of green belt area for projects that require Environmental Clearance (EC)
 - (c) Supporting services:
 - Roads **Construction of new access / approach roads within the new resettlement and/or upgradation of existing access / approach roads outside the new resettlement**
 - Solid waste management Segregation on-site, collection and disposal by Urban Local Bodies (ULBs)¹²
 - Water Supply Connection to water supply mains
Construction of borewell(s)
Provision of large water storage tanks, as deemed necessary
 - Sewerage Construction of septic tanks
Construction of sewage treatment plant (STP)
Connection to underground sewage system (UGSS)
 - Wastewater Construction of decentralized wastewater treatment system (DEWATS),¹³or
Connection to STP)
 - Water Conservation Rain-water harvesting pits / tanks
 - Drainage Construction of storm water drains for rainwater runoff
 - Electricity Connection to electricity grid¹⁴
Provisions of streetlights
Rooftop solar panels / LEDs
Provision of CNG / LPG / DG sets for ensuring continuous electricity to STP, DEWATS, etc.
- (ii) Removal (demolition) of encroachments, clearance and fencing
- (iii) Regeneration works at cleared encroachments to include at a minimum:¹⁵

¹²No new landfill will be supported under this sector loan.

¹³https://wedc-knowledge.lboro.ac.uk/resources/books/DEWATS_-_Chapter_07.pdf

¹⁴No new electricity generation source or electricity substation will be supported under this sector loan except for rooftop solar panels / LEDs.

¹⁵The scope of work for regeneration works as listed above will be implemented at a minimum and streamlined as per the situation analysis of the site-specific encroached area and in consultation with and support of the ULBs or PWDs.

- (a) Re-greening / re-vegetation of banks / land along water bodies and channels;
- (b) New plantations with native species;
- (c) Implementation of site-specific plans in close coordination with ULBs or Public Works Department (PWD) e.g., waste management plan, sewerage collection and management plan, etc.; and
- (d) Repair any structure that has been inadvertently damaged.

D. Purpose of Environmental Assessment and Review Framework

9. The Environmental Assessment and Review Framework (EARF) will cover output 1 under the purview of HUDD (EA) and TNSCB (IA) i.e., affordable housing for vulnerable communities.

10. Consistent with ADB SPS 2009, this EARF will:

- (i) Guide the TNSCB to comply with the provisions of ADB SPS 2009 and the relevant national legal and regulatory framework;
- (ii) Guide the TNSCB in subproject selection, screening and categorization, environmental assessment, preparation and implementation of the safeguards plans and documents such Initial Environmental Examinations (IEEs) including undertaking Environmental, Health and Safety (EHS) audits of Existing Facilities and environmental assessment of Associated Facilities:
 - (a) Existing Facilities - ADB SPS, 2009 requires for projects involving existing facilities and/or business activities that already exist, the borrower will undertake an environment and/or social compliance audit, including on-site assessment to identify past or present concerns related to impacts on the environment, involuntary assessment and indigenous persons. The objective of the audit is to determine if actions were in accordance with SPS and to identify and address outstanding compliance issues; and
 - (b) Associated Facilities - ADB SPS 2009 requires that assessment encompasses associated facilities that are not funded as part of the project (funding may be provided separately by the borrower or by third parties), and whose viability and existence depend exclusively on the project and whose goods or services are essential for successful operation of the project.
- (iii) Provide a summary of anticipated potential adverse environmental impacts on physical, environmental and ecological resources as well as human environment;
- (iv) Specify environmental management, monitoring and reporting requirements in a subproject specific Environmental Management Plan (EMP);
- (v) Guide the TNSCB to conduct meaningful consultations with stakeholders including affected persons / project beneficiaries that will be relocated, host communities (residing near new resettlement sites) as well as establish a grievance redress mechanism to receive and facilitate resolution of environmental grievances;
- (vi) Guide the TNSCB in information disclosure requirements including disclosure of draft and final environmental assessments, and its updates if any, in a timely manner, in an accessible location and in a form and language understandable to affected people and other stakeholders;
- (vii) Guide the TNSCB in procedures for monitoring environmental management

plans for the project and ensure appropriate documentation is undertaken including submission and disclosure of monitoring reports to ADB for review as per agreed upon timeline i.e., on quarterly (quarterly progress reports) and annual basis;

- (viii) Describe institutional and organizational arrangements and responsibilities in relation to preparation, implementation and progress review of safeguards documents of the subprojects. *Note: TNSCB has set up a Project Management Unit (PMU) and three Project Implementation Divisions (PIDs). All safeguard activities described under this EARF will be undertaken by the PMU and PIDs (refer to brief discussion under Section 2.6 and details in Section 6);* and
- (ix) Assess TNSCB's institutional capacity for safeguards implementation and identify needs for training measures and capacity building.

11. Since the safeguard documents (IEEs and EMPs) to be prepared for the subprojects are the Borrower's documents, these documents shall be officially endorsed and approved by the TNSCB and will be submitted to ADB for review and approval.

12. Overall, the EARF ensures that all subprojects, in the entirety of their project cycle, will not deteriorate or interfere with the environmental sensitivity of a project area, but rather improve environmental outcomes.

13. Table 1.2 provides an overview of safeguards requirements, triggers and timing for output 1 as per ADB SPS, 2009.

Table 1.2. Environmental Safeguards Requirement for Output 1

Safeguard Requirements	Trigger	Timing
EARF	Proposed subprojects with potential adverse environmental impacts	Before loan approval
Draft and final IEE for selected sample subprojects in line with the EARF, ADB SPS 2009 and national regulatory requirements. ¹⁶ A final IEE must be prepared and submitted for ADB review and approval prior to any contract award.	Category B subprojects	Before loan approval

¹⁶Note: For subprojects under output 1, draft IEE will be prepared taking detailed design considerations such as the layout / floor plan, site geo-tech investigations outcomes, site water quality analysis, site topo-survey details / contour gradients, and KMZ/KML files that will be cleared by the TNSCB. In absence of detailed design, a draft IEE can be prepared based on preliminary design and then submitted to ADB for review and approval. Following the detailed design, a final IEE can be prepared and submitted for ADB review and approval prior to any contract award. In both cases, recommendations from the IEE such as key environmental considerations in subproject layout, design or technical specifications can further be integrated into the detailed design.

Safeguard Requirements	Trigger	Timing
Draft and final IEEs for subsequent subprojects in line with the EARF, ADB SPS 2009 and national regulatory requirements	Category B subprojects	After loan approval and up to the end period of the sector loan
The IEE will stipulate information submission and disclosure of monitoring reports to ADB for review as per agreed upon timeline	Construction and Operation Works	After loan approval On a quarterly and annual basis during construction and operation stages up to the end period of the sector loan.

E. Project Categorization

14. **Categorization.** The categorization follows the safeguards principles as per ADB Safeguards Policy Statement (SPS 2009).

15. For all subprojects to be funded under output 1 the key exclusion criteria (refer to Table 1.3) and the environmental guidelines for subproject selection (refer to Table 1.4) agreed upon by the EA and IAs applies. If the subproject does not meet the key exclusion criteria and the environmental subproject selection criteria then it must be rejected and will not be considered for processing under the sector loan.

16. To determine the environmental project categorization for output 1, five sample subprojects were selected for due diligence and environmental assessment. This was based on subproject sites (i) that met the key exclusion criteria and environmental subproject selection criteria (ii) had the most available information, and (iii) had the most likely environmentally sensitive receptors as determined during the initial due diligence stage of ADB loan processing. The profile of the five selected sample subprojects are shown in Table 1.5 and details are included in Appendix 2.

17. The environment due diligence used a template developed for environmental guidelines for subproject selection for IRSHUPSP (refer to Appendix 1), ADB's rapid environmental assessment (REA) checklist (refer to Appendix 4), and "No Mitigation scenario checklist (refer to Appendix 5).

18. The environmental assessments of the sample subprojects show that output 1 of IRSHUPSP is not likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. Overall, the subprojects will have only small-scale, localized impacts on the environment; the potential adverse environmental impacts are mainly due to construction, which can be minimized / mitigated by proven measures and environmentally sound engineering and construction practices. Subsequent subprojects are expected to be within the same range of scope, scale and setting as with the sample subprojects, and producing generally the same impacts at same or lesser magnitude. No category A under ADB SPS, with potential significant adverse environmental impacts that are irreversible, diverse or unprecedented, will be considered for implementation under the sector loan.

19. Output 1 of IRSHUPSP is classified as Category B for environment per ADB SPS. Any subproject that will reclassify the project to environment Category A as per ADB SPS will not be

considered as indicated in the key exclusion criteria and environmental guidelines for subproject selection in this EARF.

Table 1.3. Key Exclusion Criteria

Exclusion criteria includes but is not limited to:	Remarks
<ul style="list-style-type: none"> Environment Category A¹⁷ subprojects 	<ul style="list-style-type: none"> In case a future subproject is deemed as environment category A, a major change in scope of the project shall be proposed for ADB approval.¹⁸ Bidding and awarding of contracts for such subproject shall not proceed without ADB approval of the proposed major change in scope.
<ul style="list-style-type: none"> No subprojects to be located within 10 km of a national park, sanctuary, wetland, mangroves, in coastal areas e.g., areas designated as CRZ I (ecologically sensitive area)¹⁹, backwaters, recognized biodiversity hotspots and/or within reserved forests, village forests, protected forests. 	
<ul style="list-style-type: none"> Subprojects that involve activities in the ADB Prohibited Investment Activities List (ADB SPS, 2009, Appendix 5) 	
<ul style="list-style-type: none"> Subprojects that are highly complex and sensitive²⁰ 	
<ul style="list-style-type: none"> Subprojects that are category A or have adverse impacts on indigenous people safeguards²¹ 	
<ul style="list-style-type: none"> Subprojects which result in significant adverse impacts on any sensitive natural and human receptors e.g., species or habitat of high conservation value, significant number of trees of economic value (such as fruit bearing trees), water bodies (such as wetlands, 	<ul style="list-style-type: none"> For any subproject activity that may affect PCRse.g., local heritage sites /archaeological sites, places of worship, etc., all applicable ADB SPS 2009 requirements shall be followed. In such cases, the TNSCB shall (i) confirm that no alternatives to removal are available; (ii) prepare a heritage impact assessment outlining appropriate mitigation measures that shall comply with the comprehensive management plan of

¹⁷ Refer to ADB SPS 2009 Categorization process in Section 2. Assessment of Legal Framework and Institutional Capacity.

¹⁸ In a proposed major change in scope due to stricter environmental categorization of a proposed subproject than the approved environmental categorization, ADB Safeguard Policy Statement (SPS), 2009 requires the following: (i) conduct of new environmental impact assessment and prepare an environmental impact assessment (EIA) report; (ii) submit EIA report to ADB for review, which will include a peer-review among relevant departments within ADB; and (iii) disclose on ADB website the new EIA report 120 days prior to the approval by ADB of the proposed major change in scope for the project.

¹⁹ The procedure for CRZ clearances has been streamlined in CRZ 2019 Notification. Now, only such projects which are located in the CRZ-I (Ecologically Sensitive Areas) and CRZ IV (area covered between Low Tide Line and 12 Nautical Miles seaward) will be dealt with for CRZ clearance by the relevant central Ministry. The powers for clearances with respect to CRZ-II and III have been delegated at the State level.

²⁰ Projects that ADB deems as highly risky or contentious or involve serious and multidimensional and generally interrelated potential social and/or environmental impacts.

²¹ Refer to ADB SPS, 2009 Safeguard Requirements 3: Indigenous Peoples.

Exclusion criteria includes but is not limited to:	Remarks
backwaters, rivers, lakes or ponds), existing host communities / neighborhoods, schools and/or Physical Cultural Resources (PCRs)	such site; (iii) conduct a detailed environmental assessment in line with this EARF, national and state laws and ADB SPS 2009; and (iv) consult with, and obtain official written permission from the concerned Archaeology Survey of India (ASI) and/or other relevant government agencies / religious establishment trust, if any. Such permission shall be obtained prior to finalization of the subproject detailed engineering design. ²²
<ul style="list-style-type: none"> Subprojects in unsafe proximity of electricity substations, high voltage transmission lines, underground cables, solid waste dumping yards, Oil /Gas pipelines, Coastal Regulatory Zone hazard line and/or polluting (heavy emissions / noisy) industrial activities 	For existing substations, refer to discussion in Table 1.4.
<ul style="list-style-type: none"> Subproject sites in flood prone areas, areas with a history of flooding 	
<ul style="list-style-type: none"> Subprojects that are not technically, financially, or economically viable 	

Table 1.4. Environmental Guidelines for Subproject Selection under Output 1

Environmental Guidelines for Subproject Selection		Remarks
All Subprojects including supporting services	Complies with key exclusion criteria in Table 1.3	
	Complies with ADB SPS 2009, this EARF and the national and state legal and regulatory framework	
	The primary environmental criteria for selecting subproject sites to be relocated is vulnerability to flooding of targeted non-titled project beneficiaries without tenure security residing in encroachments (i.e., waterbodies / waterways).	The local word for land title is 'patta'
	No new development sites in flood areas, areas with a history of flooding or areas zoned for coastal protection.	
	The selected subprojects (new development / resettlement sites) should have sufficient land for the accommodation of all project beneficiaries / resettled households and community members in line with housing space and design ratio considerations.	
	The selected subprojects (new development / resettlement sites) should be within one-hour travel time on public transport from existing	

²² Costs related to heritage impact assessment shall be borne by the TNSCB.

Environmental Guidelines for Subproject Selection	Remarks
	encroachments such that project beneficiaries / resettled households and community members have continued access to livelihood generation activities
	The selected subprojects (new development / resettlement sites) should be within a 2.5 km radius of public amenities or be within prescribed social infrastructure access norms.
	The selected subprojects (new development / resettlement sites) are greenfield; therefore, opportunity should be taken to ensure that these are connected to existing neighbourhoods / host communities, provide comprehensive infrastructure and supporting services, generate new optimally sited open spaces of adequate size, and community spaces.
	Allocation of open space reservation (OSR) equivalent to 10 percent of total area at a resettlement site; and additional 15 percent of green belt area for projects that require Environmental Clearance (EC)
	The selected subprojects should have access to or include supporting services (within the scope of this EARF ²³ at new development / resettlement sites for project beneficiaries / resettled households and community members for better environmental outcome.
	Existing supporting services, if any, will undergo EHS audit in line with ADB SPS 2009 requirements for Existing Facilities, refer to Appendix 14. EHS audit template.
	<p>If there is no access to supporting services, then the subproject shall integrate supporting services in the subproject detailed engineering design for the new development / resettlement sites and for any other housing plans under consideration in the immediate vicinity of new resettlement sites.</p> <p>Integration of supporting services is included in subproject scope of works for new development / resettlement sites (refer to discussion in Section 1.3 and must comply with the environmental guidelines for subproject selection). These will be subject to environmental assessment in line with ADB SPS 2009, this EARF and relevant national legal and regulatory framework. These may be permitted provided that no impact to sensitive receptors is demonstrated or proven.</p>
	Resettlement of project beneficiaries shall only take place after all supporting services are available and operational at new development / resettlement sites.
	Subprojects will conform to land use classification and relevant development control regulations and municipality approved master plan. Subprojects (new development / resettlement sites) not covered by the master
	Planned areas (for new resettlement sites) will guide future growth and efficiently provide basic services.

²³ Refer to Section 1.3. Subproject Scope under Output 1 for list of supporting services.

Environmental Guidelines for Subproject Selection		Remarks
	plan will require further due diligence for consideration for subproject selection as long as it meets the key exclusion criteria and prescribes to the environmental guidelines for subproject selection	
	Will not involve the use or installation of hazardous materials including asbestos, PCBs, lead based paint.	
All Subprojects including supporting services	No new construction of landfills will be supported under this sector loan	
	No new electricity generation / electricity high voltage transmission line and distribution substations will be supported under this sector loan.	<p>Subprojects should support the use of energy efficient lighting such as LEDs and/or rooftop solar panels.</p> <p>In case a dedicated substation is required for the new resettlement site; the substation should be sited outside the new resettlement perimeter at a distance of least 500 m. This new substation will be considered as an “associated facility” and will require due diligence as per ADB SPS 2009.</p> <p>In the event of unavoidable circumstances, clearances from buildings of high and extra high voltage lines will be as per the Indian Electricity Rules 1956, amended up to 25 Nov 2000, para 79 and 80.²⁴</p>
	Subprojects shall utilize water sources at sustainable levels of abstraction only (i.e., without significant reductions in the quantity or quality of the source overall), avoid polluted water sources, avoid water use conflicts by not abstracting water that is used for other purposes and ensure water quality provided complies with national drinking water standards at all times through regular monitoring.	A water source sustainability study will be undertaken for all water sources utilized by the subproject.
	Subprojects should locate sewerage treatment plants as far as possible from inhabited areas, ensure sewerage is treated to national wastewater discharge standards, ensure no discharge of wastewater occur where it could be a hazard to downstream users and include	

²⁴ Indian Electricity Rules: <http://www.mvvn.in/pdf/ier1956.pdf>

Environmental Guidelines for Subproject Selection	Remarks
	measures for the safe disposal of sewage sludge
Demolition works for all subprojects / removal of encroachments	<p>Demolition works at encroachments will</p> <ul style="list-style-type: none"> ● exclude religious structures e.g., chapels, temples, mosques, etc.; and if cannot exclude, then replacethe religious structures in consultation with the relevant stakeholders. ● involve clearance and fencing ● avoid cutting of trees ● avoid disturbance to PCRs ● repair any structure that has been inadvertently damaged ● fencing around the water body perimeter or along channel banks²⁵ <p>If under unavoidable conditions, if any of the trees are required to be cut/ felled, then prior permission as per existing procedure from Forest department and ensuring appropriate compensation including compensatory plantation at 1:10 ratio as stipulated by the High Court of Madras (WP No 7811/2010 and MP No 1/2010 dated 25/06/2010 as well as any compensation as detailed in the RF; replacement species must be approved by District Forest Department.</p> <p>For any subproject activity that may affect PCRs e.g., local heritage sites / archaeological sites, places of worship, etc., all applicable ADB SPS 2009 requirements shall be followed. In such cases, TNSCB shall (i) confirm that no alternatives to removal are available; (ii) prepare a heritage impact assessment outlining appropriate mitigation measures that complies with the comprehensive management plan of such site; (iii) conduct a detailed environmental assessment in line with this EARF, national and state laws and ADB SPS 2009; and (iv) consult with, and obtain official written permission from the concerned Archaeology Survey of India (ASI) and/or other relevant government agencies / religious establishment trust, if any. Such permission shall be obtained prior to finalization of the</p>

²⁵Fencing to ensure that re-encroachment of cleared spaces does not revert back to slums and is kept as green open space to realise ecological and public benefits from the cleared and restored waterways.

Environmental Guidelines for Subproject Selection		Remarks
		subproject detailed engineering design. ²⁶
Regeneration works for all subprojects	Regeneration work ²⁷ at cleared encroachments will include at a minimum: <ul style="list-style-type: none"> • re-greening / revegetation of banks along water bodies / channels • clearing and preventing new solid waste / sewage disposal in water bodies / channels 	

F. Environmental Due Diligence of Sample Subprojects

20. Visits to subproject sites in Tamil Nadu and meetings with EA, IA and local agencies were conducted in June and September 2019. Visits to remaining subproject sites were conducted in October and November 2019. A total of ten proposed new resettlement sites and corresponding existing encroachments marked for relocation were visited. Field observations (site visit report) that helped guide selection of five sample subprojects is provided in Appendix 2.

21. **Findings.** There are proposed subproject sites where ADB would require additional information to prove that the communities proposed for resettlement are the most vulnerable to flooding and/or other hazards in the existing encroachments and have no tenure security (i.e., no “patta”). Of ten proposed subproject sites visited between June and November 2019, safeguards due diligence was conducted in line with the key exclusion criteria listed in Table 1.3 and environmental guidelines for subproject selection listed in Table 1.4 and five sample subprojects were selected.

22. **Selected Subprojects.** The REA (refer to Appendix 4) and ‘No Mitigation Scenario’ (Scoping) checklist (refer to Appendix 5) that comprises of available and collected information specific to the subproject was prepared for the five selected sample subprojects; these confirmed that each subproject falls into Category B for environment. IEEs, including EMPs, for the selected sample subprojects are due to be completed by end of November 2020 as part of project readiness and for securing ADB Board approval for the sector loan. Additional IEEs, including EMPs, will be prepared for further selected subprojects under the sector loan. These will also set an example and guide the project proponent in preparation of IEEs and EMPs for subsequent subprojects selected under output 1. The five selected sample subprojects are summarized in Table 1.5 and map showing subproject locations in Tamil Nadu are provided in Figure 1. Detailed profile of selected sample subprojects is provided Appendix 2.

23. At time of EARF preparation there are five proposed sample subprojects that fall under the purview of Government of India (GOI) Environmental Impact Assessment (EIA) Notification 2006. These are Vallam, Reddiarpatti, Kalanivasal, Oddukamand Pallipalayam (refer to column F in Table 1.5). Therefore, a National Accreditation Board for Education and Training (NABET)/ NABEL (National Accreditation Board for Testing and Calibration Laboratories), accredited consultancy firm / organization will be appointed by the TNSCB to lead the corresponding

²⁶ Costs related to conducting a heritage impact assessment shall be borne by the TNSCB.

²⁷ Regeneration works of the cleared encroachments will be undertaken such that it does not revert back to slums and is kept as green open space to realize ecological and public benefits from the cleared and restored waterways.

studies for the required environmental clearances from the Tamil Nadu State Environmental Impact Assessment Authority (SEIAA).²⁸ Environmental clearances will be obtained by the TNSCB in a timely manner to ensure smooth subproject implementation and avoid delays. All statutory clearances will need to be obtained prior to any contract award.

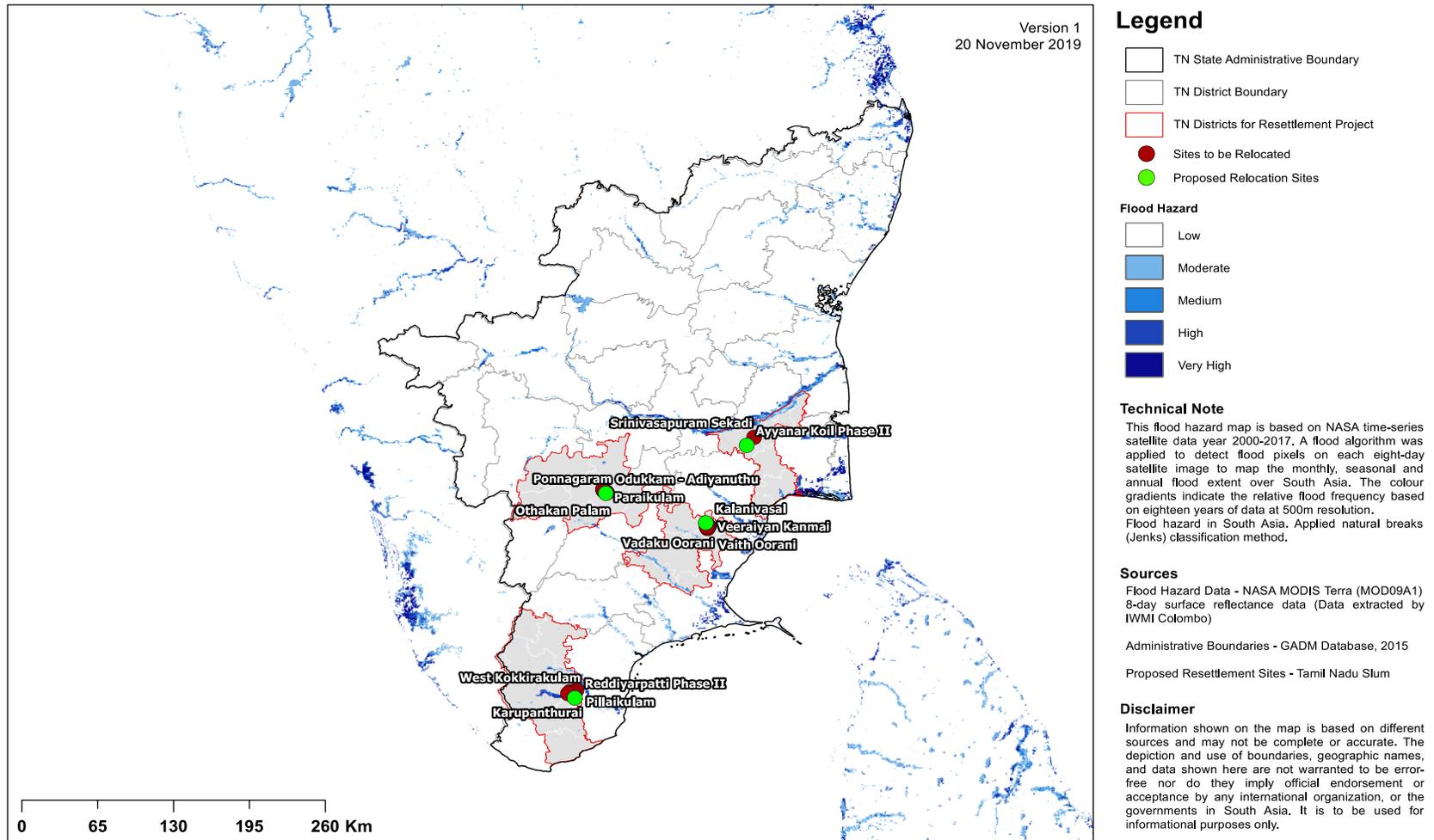
²⁸ Refer to detailed discussion on national legal and environmental regulatory requirements in Section 2. Assessment of Legal Framework and Institutional Capacity.

Table 1.5 Profile of Selected Sample Subprojects²⁹

NEW SETTLEMENT								EXISTING SETTLEMENT / ENCROACHMENT DETAILS				
A	B	C	D	E	F	G	H	I	J	K	L	M
DISTRICT	NEW SETTLEMENT / SITE NAME	LAND OWNERSHIP	Land Area (ha)	Built Up Area (Square-m)	Environmental Clearance Required from SEIAA	NEW SETTLEMENT ASCRIBES TO KEY EXCLUSION CRITERIA (see Sheet - "Guidance")	NEW SETTLEMENT ASCRIBES TO ENVIRONMENTAL CRITERIA (see Sheet - "Guidance")	NUMBER OF HOUSEHOLDS UNITS PROPOSED AT NEW SETTLEMENT	EXISTING SETTLEMENTS OK FOR RELOCATION	NUMBER OF HOUSEHOLD UNITS CONFIRMED FOR RELOCATION	EXISTING SETTLEMENT IS VULNERABLE TO FLOODING	LAND TITLES AT EXISTING SETTLEMENTS
Thanjavur	VALLAM	Revenue	3.47		Yes	Yes	Yes	969	Kadimarathu moolai	240	Yes	No
									North Alangam	218	Yes	No
									Mela alangam	489	Yes	No
									Sekkadal Road	22	Yes	No
									sub total 1	969		
Tirunelveli	REDDIYARPATTI	TNSCB	9.04		Yes	Yes	Yes	876	Pillaikulam	70	Yes	No
									Karuppandurai	36	Yes	No
									West kokkirakulam	52	Yes	No
									Meenachipuram	113	Yes	No
									Mel veeraragava puram	42	Yes	No
									Kurundhadiyapuram	10	Yes	No
									Vellakoil	10	Yes	No
									Vettuvankulam	9	Yes	No
									Elandthaikulam	465	Yes	No
									sub total 2	807		
Sivaganagai	KALANIVASHAL	Revenue	8.37		Yes	Yes	Yes	900	Chellam chetti oorani	33	Yes	No
									Vadaku oorani	57	Yes	No
									Kilaku oorani	51	Yes	No
									Thangachi oorani	58	Yes	No
									Vaith oorani	38	Yes	No
									Malaikadu kanmai	11	Yes	No
									Kurichi kanmai	66	Yes	No
									Veerayiankanmai - poramboke	576	Yes	No
									Kudikatha nenthal kanmai	4	Yes	No
									Athi thiravida kanmai	6	Yes	No
sub total 3	900											
Dindigul	ODDUKAM	Dindigul Corporation	4.81		Yes	Yes	Yes	1224	Kamarajapuram (inlet Channel for Ayyankulam kanmai)	83	Yes	No
									Ayyankulam (Kanmai)	396	Yes	No
									Paarai mettu street	199	Yes	No
									Govindasamy nagar	84	Yes	No
									Anna nagar	62	Yes	No
									Ottathakkan pallam	134	Yes	No
									Pakthavachalam nagar	175	Yes	No
									sub total 4	1133		
Namakkal	PALLIPALAYAM	Government land	1.62		Yes	Yes	Yes	520	Natta gounda pudhur	20	Yes	No
									Cauveri Nathi ora street	153	Yes	No
									Janatha nagar	203	Yes	No
									Meenavar nagar	96	Yes	No
									Periyar nagar	19	Yes	No
									sub total 5	491	Yes	No
Total New Households								4489	Total Existing Households		4300	

²⁹ The selected sample subprojects are as per the latest numbers submitted by the TNSCB on 3 December 2020.

Figure 1. Subproject Locations under Output 1 (this map is indicative, all locations are represented in Table 1.5)



II. ASSESSMENT OF LEGAL FRAMEWORK AND INSTITUTIONAL CAPACITY

24. Environmental assessment of the subprojects under output 1 will be undertaken by TNSCBPMU in line with this EARF. This EARF has been drafted in line with ADB SPS 2009, the relevant national, state and local legal and regulatory framework of GOI as well as with International Agreements which India is party to. These are detailed under this section. The International Finance Corporation (World Bank Group) Environment, Health and Safety or IFC (WBG) EHS Guidelines and Guidance Notes will be used as standards of International Best Practices for the subprojects as applicable. For each Category B subproject, IEEs will be prepared by the TNSCB PMU and all environmental clearances/permit approvals/permissions as required under national, state and local legal and regulatory frameworks of GOI will be obtained in a timely manner and prior to contract award to ensure smooth subproject implementation and avoid delays.

A. ADB Safeguards Policy Statement 2009 Requirements

25. The objective of ADB's due diligence for the sector loan is that the TNSCB ensures the environmental soundness and sustainability of the project / subproject and to support the integration of environmental considerations into the overall project decision-making process. Environmental safeguards are triggered if a project / subproject is likely to have potential environmental risks and impacts. The TNSCB PMU will follow the SPS requirements (SR1) as described below.

26. The SPS Requirements (SR1):

- (i) Use a screening process for each proposed project / subproject to determine the appropriate extent and type of environmental assessment so that appropriate studies are undertaken commensurate with the significance of potential impacts and risks.
- (ii) Conduct an environmental assessment for each proposed project / subproject to identify potential direct, indirect, cumulative, and induced impacts and risks to physical, biological, socioeconomic (including impacts on livelihood through environmental media, health and safety, vulnerable groups, and gender issues), and PCRs in the context of the project's area of influence.³⁰ Assess potential trans-boundary and global impacts, including climate change. Use strategic environmental assessment where appropriate.
- (iii) Examine alternatives to the project's location, design, technology, and components and their potential environmental and social impacts and documents the rationale for selecting the particular alternative proposed. Also consider the 'no project' alternative.
- (iv) Avoid, and where avoidance is not possible, minimize, mitigate, and/or offset adverse impacts and enhance positive impacts by means of environmental planning and management. Prepare an EMP that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators. Key considerations for EMP preparation include mitigation of potential

³⁰ Area of influence will be defined for each environmental assessment and will depend on the anticipated or expected extent of potential adverse impacts to different environmental components e.g., air shed, acoustic environment, surface and ground water, terrestrial and/or aquatic ecosystems.

- adverse impacts to the level of no significant harm to third parties, and the polluter pays principle.
- (v) Carry out meaningful consultation with affected persons and facilitate their informed participation. Ensure women's participation in consultation. Involve stakeholders, including affected persons and concerned NGOs, early in the project preparation process and ensure that their views and concerns are made known and understood by decision makers and taken into account. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to environmental assessment.
 - (vi) Establish a grievance redress mechanism (GRM) to receive and facilitate resolution of the affected person's concerns and grievances regarding the project's environmental performance.
 - (vii) Disclose a draft environmental assessment (draft IEE and EMP) in a timely manner, before project /subproject appraisal, in an accessible place and in a form and language(s) understandable to affected persons and other stakeholders. Disclose the final environmental assessment (final IEE and EMP), and its updates if any, to affected persons and other stakeholders.
 - (viii) Implement the EMP and monitor its effectiveness. Document monitoring results, including the development and implementation of corrective actions, and disclose monitoring reports.
 - (ix) Do not implement project / subproject activities in areas of critical habitats³¹, unless (i) there are no measurable adverse impacts on the critical habitat that could impair its ability to function, (ii) there is no reduction in the population of any recognized endangered or critically endangered species, and (iii) any lesser impacts are mitigated. If a project is located within a Legally Protected Area, implement additional programs to promote and enhance the conservation aims of the protected area. In an area of natural habitats³², there must be no significant conversion or degradation³³, unless (i) alternatives are not available, (ii) the overall benefits from the project / subproject substantially outweigh the environmental costs, and (iii) any conversion or degradation is appropriately mitigated. Use a precautionary approach to the use, development, and management of renewable natural resources³⁴.

³¹Critical habitat is a subset of both natural and modified habitat that deserves particular attention. Critical habitat includes areas with high biodiversity value, including habitat required for the survival of critically endangered or endangered species; areas having special significance for endemic or restricted-range species; sites that are critical for the survival of migratory species; areas supporting globally significant concentrations or numbers of individuals of congregatory species; areas with unique assemblages of species or that are associated with key evolutionary processes or provide key ecosystem services; and areas having biodiversity of significant social, economic, or cultural importance to local communities. Critical habitats include those areas either legally protected or officially proposed for protection, such as areas that meet the criteria of the World Conservation Union classification, the Ramsar List of Wetlands of International Importance, and the United Nations Educational, Scientific, and Cultural Organization's world natural heritage sites.

³²Natural Habitat is land and water areas where the biological communities are formed largely by native plant and animal species, and where human activity has not essentially modified the area's primary ecological functions. Modified habitat is where natural habitat has apparently been altered, often through introduction of alien species of plants and/or animals.

³³Significant conversion or degradation is (i) the elimination or severe diminution of the integrity of a habitat caused by a major, long-term change in land or water use; or (ii) the modification of a habitat that substantially reduces the habitat's ability to maintain viable populations of its native species. Significant conversion may include, for example, land clearing; replacement of natural vegetation (for example, by crops or plantations); permanent flooding (by a reservoir for instance); drainage, dredging, filling, or canalization of wetlands; or surface mining.

³⁴Sustainable resource management is management of the use, development, and protection of resources in a way, or at a rate, that enables persons and communities, including Indigenous Persons, to provide for their current

- (x) Apply pollution prevention and control technologies and practices consistent with International Best Practices as reflected in internationally recognized practices and standards such as the IFC (WBG) EHS Guidelines and Guidance Notes³⁵. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gases (GHG) emissions, waste generation, and release of hazardous materials from their production, transportation, handling, and storage. Avoid the use of hazardous materials subject to international bans or phase-outs. Purchase, use, and manage pesticides based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides.
- (xi) Provide workers with safe and healthy working conditions, suitable accommodation, and prevent accidents, injuries, and disease. Establish occupational safety, preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of workers. Work with local communities to establish community health and safety procedures.
- (xii) Conserve PCRs and avoid destroying or damaging them by using field-based surveys that employ qualified and experienced experts during environmental assessment. Provide for the use of “chance find” procedures that include a pre-approved management and conservation approach for materials that may be discovered during project /subproject implementation.

27. **Screening and Categorization.** The TNSCB PMU will ensure that each of the subprojects will be screened and categorized at the earliest stage of project cycle, based on REA checklist that comprises of available and collected information on the subprojects and the No Mitigation Scenario (Scoping) checklist. Screening and categorization is undertaken to (i) reflect the significance of potential impacts or risks that a subproject might present; (ii) identify the level of environmental assessment and institutional resources required for the safeguard measures; and (iii) determine information disclosure requirements.

28. ADB uses a classification system to reflect the significance of a proposed project / subproject’s potential environmental impacts. A project / subproject’s category is determined by the category of its most environmentally sensitive component, including potential direct, indirect, cumulative, and induced impacts in the project’s area of influence as well as transboundary and global impacts and risks (including climate change) due to the project. Each project / subproject is scrutinized as to its type, location, scale, sensitivity and magnitude of its potential environmental impacts. Projects / subprojects are assigned to one of the following four categories:

- (i) **Category A** - A proposed project / subproject is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the subproject sites or facilities subject to physical works. EIA is required. Category A may apply to projects located in environmentally sensitive areas (ESA). Category A subprojects are excluded under the scope of this sector loan.

social, economic, and cultural well-being while also sustaining the potential of those resources to meet the reasonably foreseeable needs of future generations.

³⁵[IFC EHS Guidelines](#)

- (ii) **Category B** - A proposed project / subproject is classified as category B if its potential adverse environmental impacts are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. IEE is required.
- (iii) **Category C** - A proposed project / subproject is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed.
- (iv) **Category FI** - A proposed project / subproject is classified as category FI if it involves investment of ADB funds to or through a FI. An Environmental and Social Management System (ESMS) is required.

29. **Anticipated Adverse Impact Mitigation and Management.** Where potentially significant adverse impacts and risks cannot be avoided or prevented, mitigation measures and management actions will be identified by the TNSCB PMU so that the project / subprojects are designed, constructed, and operated in compliance with this EARF, ADB SPS 2009, applicable National, State and local laws and regulations, and International Standards and Best Practices. The level of detail and complexity of the environmental planning documents and the priority of the identified measures and actions will be commensurate with the subproject's impacts and risks. Key considerations include mitigation of potential adverse impacts to the level of "no significant harm to third parties", the polluter pays principle, the precautionary approach, and adaptive management. The TNSCB PMU will prepare an IEE and EMP in line with this EARF that will address such impacts and risks and will include the proposed mitigation measures, monitoring and reporting requirements, emergency response procedures, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators.

30. If some residual impacts are likely to remain significant after mitigation, the IEE and EMP may also include appropriate compensatory measures (offset) that aim to ensure that overall, the project / subproject does not cause significant net degradation to the environment. Such measures may relate, for instance, to conservation of habitat and biodiversity, preservation of ambient conditions, and GHG emissions.³⁶

31. To further ensure that project / subproject contractors appropriately implement the agreed safeguard measures, the TNSCB PMU will include the safeguard requirements (subproject EMPs) in bidding documents and civil works contracts. The TNSCB PMU will ensure that all applicable national, state and local regulatory approvals must be in place and the relevant provisions from the EMP reflect the ADB approved subproject detailed design prior to finalization of contracts and commencement of works. Detailed discussion on preparation of bids and award of contracts is provided in Section 4 of this EARF.

32. **Existing Facilities.** ADB SPS 2009 requires for projects / subprojects involving existing facilities and/or business activities that already exist, the TNSCB PMU will undertake an environment and/or social compliance audit, including on-site assessment to identify past or present concerns related to impacts on the environment, involuntary assessment and

³⁶Monetary compensation with respect to physical offset is acceptable in exceptional circumstances, provided that the compensation is used for environmental benefits of the same nature and is commensurate with the project's residual impact. If such a case arises in the future, this will be subject to further discussion between ADB and TNSCB.

indigenous persons. The objective of the audit is to determine if actions were in accordance with ADB SPS and to identify and address outstanding compliance issues.

33. **Associated Facilities.** ADB SPS 2009 requires that environmental assessment undertaken by the TNSCB PMU encompasses associated facilities, if any, that are not funded as part of the project / subproject (funding may be provided separately by the TNSCB or by third parties), and whose viability and existence depend exclusively on the project / subproject and whose goods or services are essential for successful operation of the project / subproject.

34. **Analysis of Alternatives.** The TNSCB PMU will examine alternatives to projects / subprojects that result in potentially significant adverse impacts. Alternatives will be in terms of project / subproject's location, design, technology and/or components that would avoid, and, if avoidance is not possible, minimize adverse environmental impacts and risks. The rationale for selecting a project / subproject, its specific location, design, technology and components will be properly documented and will adhere to the key exclusion criteria listed in Table 1.3 and environmental guidelines for subproject selection listed in Table 1.4. The "no project" alternative will be also considered.

35. **Information Disclosure, Participation and Consultation Requirements.** The TNSCB PMU and PIDs will ensure public participation in the course of preparing the subproject IEEs and EMPs and conduct information disclosure via distribution of project information brochure/ booklet (PIB) in local language in the subproject affected areas during stakeholder consultations, public meetings at district, city, divisional level and focus group discussions (FGDs) with both women and men of the subproject affected areas; PIBs will be available in publicly accessible locations and information boards will be set up at appropriate locations. Stakeholders will include project beneficiaries of existing encroachments that will be resettled, host communities at new development / resettlement sites and any other affected people. The TNSCB PMU and PIDs will facilitate their informed participation early in the project cycle and ensure that their views and concerns are understood, made known and taken into account in the final subproject detailed design and planning. Information disclosure topics will include but not limited to the subproject design, implementation schedule, graduation approach as part of social safeguard activities, key religious periods or community practices, key construction activities in particular those that result in disturbance or nuisance and potential community health and safety issues, Grievance Redress Mechanism, status of compensation (refer to social safeguards due diligence plans and documents) and safety trainings for host communities residing close to the proposed new development / resettlement sites.

36. The ADB Board and the TNSCB PMU will ensure that IEEs and EMPs shall be disclosed on ADB and TNSCB public websites before subproject clearance by the TNSCB Board.³⁷

37. The TNSCB PMU will document compliance with safeguards, including subproject EMPs in quarterly progress reports during construction stage and annual reports during operation stage; these will be submitted to ADB and disclosed on ADB public website. Reporting by the TNSCB PMU to ADB will continue until project completion report is prepared.

38. **Grievance Redress Mechanism.** The TNSCB PMU will set up a GRM and assign a GRM focal person at each subproject site in line with this EARF to document and resolve complaints from concerned stakeholders including project beneficiaries, host communities, NGOs, if any, etc. The GRM will address concerns and complaints promptly via a transparent

³⁷ The composition and structure of the /IEE and EMP reports will follow the requirements presented in ADB SPS 2009, Appendix 1, Annex 1.

process. Complaints and their resolution will be documented and reported in project / subproject Quarterly Progress Reports (QPRs) .Detailed discussion on GRM is provided in Section 5 of this EARF.

39. **Climate Change.** The project is classified as medium climate risk category and will address urban climate change through structured climate mitigation and adaptation finance. A detailed climate risk and vulnerability assessment will be undertaken during project preparation.

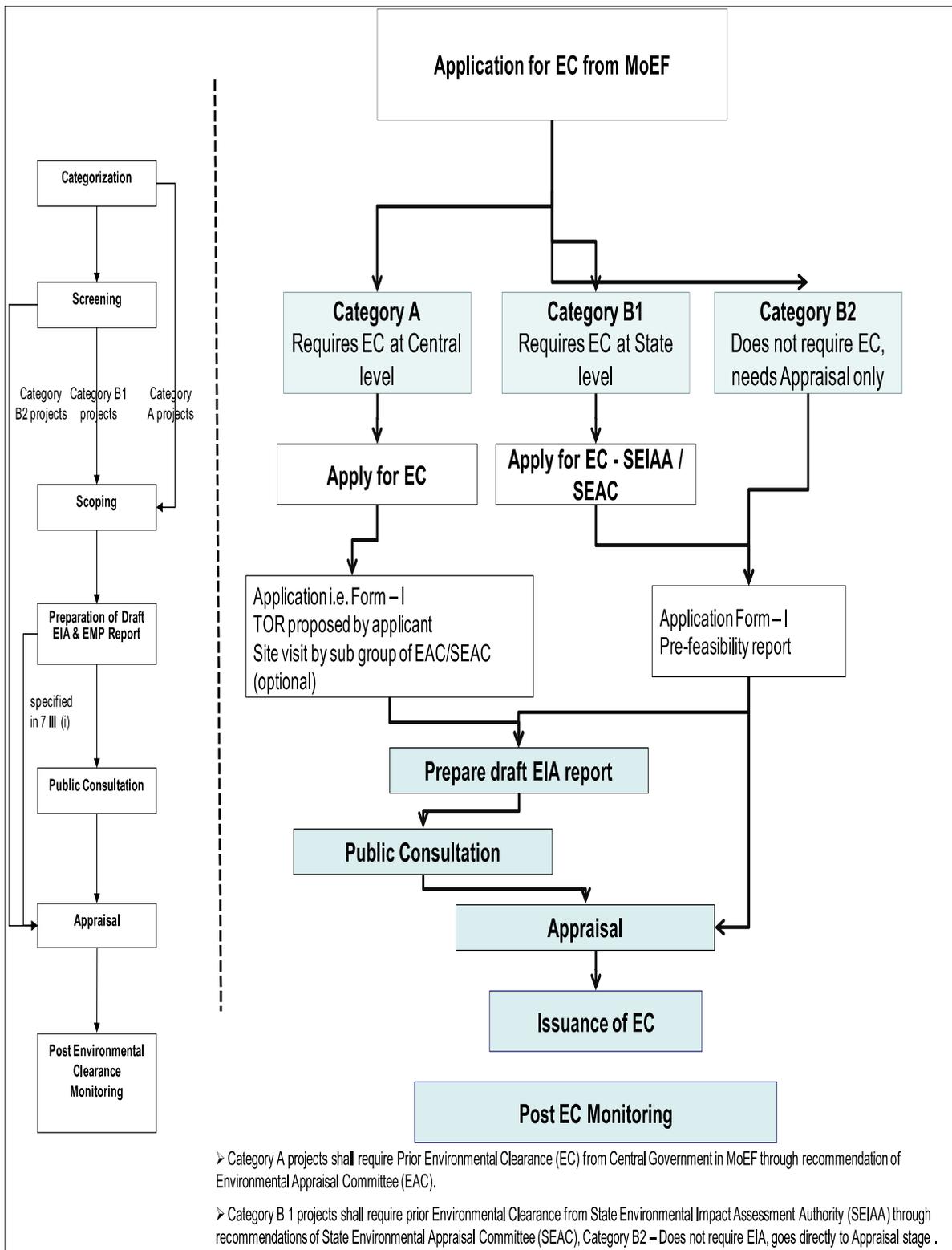
B. National Policy and Environmental Regulatory Requirements

40. Environmental Assessment Notification, 2006 and Subsequent Amendments. Issued under the Environment (Protection) Act, 1986, the Environmental Impact Assessment (EIA) Notification of 2006 (replacing the EIA Notification of 1994), sets out the requirement for environmental assessment in India. This states that environmental clearance is required for specified activities/projects, and this must be obtained before any construction work or land preparation (except land acquisition) may commence. Projects are categorized as A or B depending on the scale of the project and the nature of its impacts.

- (i) Category 'A' projects require environmental clearance from the MOEFCC. The TNSCB is required to provide preliminary details of the project in the form of a Notification, after which an expert appraisal committee (EAC) of the MOEFCC prepares comprehensive TOR for the EIA study, which are finalized within 60 days. On completion of the study and review of the report by the EAC, MOEFCC considers the recommendation of the EAC and provides the environmental clearance, if appropriate.
- (ii) Category B projects require environmental clearance from the SEIAA. The State level EAC categorizes the project as either B1 (requiring EIA study) or B2 (no EIA study) and prepares TOR for B1 projects within 60 days. On completion of the study and review of the report by the SEAC, the SEIAA issues the environmental clearance based on the SEAC recommendation. The Building / Construction projects /Area development and Townships fall under sub-category 8 (a) and 8 (b) of Annexure I – Schedule of EIA Notification 2006 – Requiring prior Environmental Clearance. If the built-up area for each selected sample subproject is equal to or greater than 20,000 square-m and less than 150,000 square-m, environmental clearance from the SEIAA is required. For such subprojects NABET / NABL, an accredited consultancy firm / organization will be appointed by the TNSCB to lead the associated studies.³⁸ Figure 2 shows the process of obtaining an Environmental Clearance in India. Note that for only B2 type projects, the Application Form -1 Pre-Feasibility Report goes straight to Appraisal Stage.

³⁸ http://environmentclearance.nic.in/writereaddata/Form-1A/HomeLinks/building-construction_may-10.pdf; Source: MOEFCC

Figure 2. Environmental Clearance Process in India from MOEF&CC



41. **Other Relevant Environmental Regulations.** Besides the EIA Notification 2006, the implementation of the subprojects under output 1 will be governed by the Central and state environmental acts, rules, regulations, and standards. These regulations impose restrictions on activities to minimize and/or mitigate likely impacts on the environment. It is the responsibility of the TNSCB to ensure subprojects are consistent with the policy, legal and administrative framework across all hierarchy - national, state, and local. Table 2.1 and Table 2.2 presents salient features of these regulations, both at central and state level, and their applicability to output 1.

Table 2.1. National Environmental Legislations and Requirements Specific to Output 1

Act / Rule / Notification ³⁹	Brief	Regulator	Applicability to Output 1 / Remarks	
National Environment Policy (NEP), 2006	NEP is a comprehensive guiding document in India for all environmental conservation programs and legislations by Central, State and local governments. The dominant theme of this policy is to promote betterment of livelihoods without compromising or degrading the environmental resources. The policy also advocates collaboration method of different stakeholders to harness potential resources and strengthen environmental management.	-	Yes	The subprojects under output 1 should adhere to NEP principle of “enhancing and conservation of Environmental resources and abatement of pollution”.
Environmental Impact Assessment Notification, 2006	The Notification imposes restrictions and prohibitions on new projects or activities and also on the expansion or modernization of existing projects or activities based on their potential environmental impacts.	MOEFCC / SEIAA	Yes	All projects/activities being conceptualized, developed, implemented or funded under output 1 should take cognizance of the Schedule of Activities requiring Environmental Clearance under this Notification and if applicable, required clearances from MOEFCC / SEIAA should be taken. ⁴⁰
Notification on Eco-Sensitive Zones (ESZ)	Eco sensitive zones are of significant ecological importance, and to conserve and protect the natural resources and living beings, several zones are declared in the country as eco sensitive zones by notifications. Besides for specific reasons, buffer areas around protected areas (national park, wildlife sanctuaries etc.) are also declared as ESZ in this notification.	Forest Department, Government of Tamil Nadu MOEFCC	No	All projects/activities being conceptualized, developed, implemented, operational and/or funded under output 1 are not in close proximity of any ESZ as notified by the State Forest Department, Government of Tamil Nadu. The notified ESZ are:

³⁹<http://moef.gov.in/environment/>⁴⁰ The five proposed sample subprojects fall under the purview of Government of India (GOI) Environmental Impact Assessment (EIA) Notification 2006. These are Vallam, Reddiarpatti, Kalanivasal, Oddukam and Pallipalayam (refer to column F in Table 1.5).

Act / Rule / Notification ³⁹	Brief	Regulator	Applicability to Output 1 / Remarks	
				<p>Vaduvloor Bird Sanctuary, Kanjirankulam Bird Sanctuary, Srivilliputhur Grizzled Squirrel sanctuary, Megamalai Wildlife sanctuary, Gulf of Mannar Marine National Park, Vettangudi Birds sanctuary, Kodaikanal Wildlife Sanctuary, Sakkarakottai Bird Sanctuary, Vallanadu Blackbuck Sanctuary, Oussudu Lake Bird Sanctuary and Point Calemere Wildlife Sanctuary</p> <p>Any project activity located in ESZs will require prior permission from ESZ Monitoring Committee.</p>
<p>Coastal Regulation Zone (CRZ) Notification, 2011 and amendments⁴¹</p>	<p>Promotes sustainable development based on scientific principles taking into account the natural hazards such as increasing sea levels due to global warming.</p> <p>Declares coastal stretches as CRZ and restricts new construction, and industrial activities.</p> <p>Notification defines CRZ in I, II, III, IV Categories based on the environmental sensitivity and existing development.</p> <p>Groundwater abstraction in the CRZ is restricted; All project activities falling in the CRZ requires clearance from the TNSCZMA/MOEFCC⁴²; clearance requires conduct of</p>	<p>Tamil Nadu State Coastal Zone Management Authority (TNSCZMA) / MOEFCC</p>	<p>No</p>	<p>All projects/activities being conceptualized, developed, implemented or funded under output 1 are and will not be located by the coast, specifically in CZR-I (ecologically sensitive areas) or in close proximity to backwaters.</p> <p>Tamil Nadu has a coastline of 1,074 km. CRZ (landward side) include the following:</p> <ul style="list-style-type: none"> (i) land area from High Tide Line (HTL) to 500 m on the landward side on the sea front: (ii) land area between HTL to 100 m or width of creek whichever is less on the landward side along the tidal

⁴¹ Note CRZ Notification 2019 supersedes the Notification issued in 2011 and 1991. However, State of Tamil Nadu still ascribes to Notification 2011 conditions.

⁴² there are some subprojects that are exempted from CRZ clearances even though they may fall under the CRZ zone, examples include bulk water supply, last mile connectivity, Tsunami housing projects), etc. Such subprojects do not fall under the purview of output 1.

Act / Rule / Notification ³⁹	Brief	Regulator	Applicability to Output 1 / Remarks	
	rapid EIA study by an Accredited Consultant Organization / Body(e.g., NABET/NABL)			influenced water bodies connected to sea and; (iii) land area between HTL and Low Tide Line (LTL). No resettlement sites will be in CRZ.
Central Ground Water Authority, Notification, 1997	It provides for regulation and control of ground water development and management.	Central Ground Water Authority / Regional Office / State Designated Authority	Yes	All projects being developed, implemented, operational or funded under output 1 that are dependent on ground water as a source of water, should take cognizance of the provisions of this Notification/Guidelines and require to obtain permission from the Central Ground Water Board/Regional Office/ State Designated Authority
The Environment Protection Act, 1986 The Environment Protection Rules, 1986	It provides for the protection and improvement of environment and the prevention of hazards to human beings, other living creatures, plants and property	MOEFCC / Tamil Nadu Pollution Control Board (TNPCB)	Yes	All projects/activities/ that are being developed, implemented, established, operational and/or being funded under output 1, that would discharge or emit any environmental pollutant should take cognizance of this Act / Rules and ensure compliance to the prescribed emission standards
Water (Prevention and Control of Pollution) Act, 1974, amended 1988 and its Rules, 1975.	The Act was established to provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water, by Central Pollution Control Board (CPCB) and State Pollution Control Board (SPCB) and for conferring on and assigning powers and functions. Some important provisions of the Act are: - No persons shall cause or permit any poisonous, noxious or polluting matter determined in accordance with standards as	Tamil Nadu Pollution Control Board (TNPCB)	Yes	As applicable to proposed subprojects; CTE and CTO: (i) hot mix units /batching units; (ii) vehicles emitting air pollutants; (iii) construction (workers) camps. Compliance to conditions and effluent disposal standards stipulated in CTE and CTO.

Act / Rule / Notification ³⁹	Brief	Regulator	Applicability to Output 1 / Remarks	
	<p>may be laid down by the SPCB to enter into any stream or well or sewer or on land</p> <p>- No person shall cause or permit to enter into any stream any other matter which may tend, either directly or in combination with similar matters, to impede the proper flow of the water of the stream in a matter leading or likely to lead to a substantial aggravation of pollution due to other causes or of its consequences</p> <p>- No person shall, without the prior consent of the SPCB: establish any industry, operation or process, or a treatment and disposal system which is likely to discharge sewage or effluent into stream, well, sewer or on land; setting up of industry or process that generates wastewater requires CPCB's consent to establish and consent to operate (CTO) after the establishment as per consent to establish (CTE).</p>			
Air (Prevention and Control of Pollution) Act, 1981, amended 1987 and its Rules, 1982.	The Act was enacted to achieve prevention, control and abatement of air pollution activities by assigning regulatory powers to CPCB and SPCB s for all such functions. Establishes ambient air quality standards	Tamil Nadu Pollution Control Board (TNPCB)	Yes	As applicable to proposed subproject; CTE and CTO: (i) diesel generators; (ii) hot mix units / batching units; (iii) vehicles emitting air pollutants; (iv) construction camps. Compliance to conditions and emissions standards stipulated in the CTE and CTO.
The Noise Pollution (Regulation and Control) Rules, 2000	It provides for regulations to control ambient noise levels in public places from sources such as industries/construction works/community events, etc.	Tamil Nadu Pollution Control Board (TNPCB)	Yes	All projects/activities/ being constructed, operational and/or funded under output 1 that deal with sound emitting equipment(s) while operational or during construction should take cognizance of the provisions/standards

Act / Rule / Notification ³⁹	Brief	Regulator	Applicability to Output 1 / Remarks	
				of these Rules and ensure compliance
The Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008	It provides for regulation and control of indiscriminate disposal of Hazardous waste; and its sound management to reduce risks to environmental and human health	Tamil Nadu Pollution Control Board (TNPCB)	Yes	All activities being implemented, operational and/or funded under output 1 that deal with generation/handling/storage/processing of hazardous waste should take cognizance of the provisions/schedules of these Rules and obtain authorization from the Designated Authority/ TNPCB
Manufacture, Storage, and Import Of Hazardous Chemical Rules, 1989	Defines hazardous chemicals stipulates rules, procedures to manufacture, storage and import of hazardous chemicals	Tamil Nadu Pollution Control Board (TNPCB) and Directorate of Industrial Safety and Health	Yes	As applicable to proposed subprojects and/or "Existing Facilities" since there could be temporary storage of hazardous chemicals.
Municipal Solid Waste Management Rules, 2016	Rules to manage municipal solid waste generated; provides rules for segregation, storage, collection, processing and disposal.	Tamil Nadu Pollution Control Board (TNPCB)	Yes	Solid waste generated at the proposed facilities / construction camps / housing units shall be managed and disposed in accordance with the Rules
Construction and Demolition (C & D) Waste Management Rules, 2016	Rules to manage construction and waste resulting from construction, re-modelling, repair and demolition of civil structure. Rules define C & D waste as comprising of building materials, debris resulting from demolition / re-modelling or repairs	Tamil Nadu Pollution Control Board (TNPCB)	Yes	Construction and demolition waste generated at due to civil works at subproject construction sites and/or demolition of existing civil structures at encroached areas (equal to or greater than 20 tons per day or 300 tons per subproject in a month) shall be managed and disposed as per these Rules.

Act / Rule / Notification ³⁹	Brief	Regulator	Applicability to Output 1 / Remarks	
The Ozone Depleting Substances (Regulation & Control) Rules, 2000	It provides for regulatory measures so as to ensure progressive phasing out of domestic production and imports of ozone depleting substances	MOEFCC	No	All activities being implemented, operational and/or funded under the output 1 do not involve the processing/ imports/ exports of Ozone depleting substances.
Gas Cylinder Rules and Static and Mobile Pressure Vessels (Unfired) Rules, 1981	For any pressurized liquid stored or handled on site	MOEFCC	Yes	All activities being implemented, operational and/or funded under the output 1 that involve any pressurized liquid stored or handled on site such as Liquefied Petroleum Gas, Compressed Natural Gas, Diesel.
The Batteries (Management & Handling) Rules, 2001	It provides for regulations towards proper management and handling of Lead Acid Batteries so as to avoid, mitigate, minimize adverse impact on environment and human health	MOEFCC	No	All activities being implemented/ operational and/or funded under the sector loan do not involve the manufacture, handling, purchase and use of Lead Acid batteries.
Indian Forest Act, 1927	It consolidates the law relating to forests, the transit of forest-produce and the duty leviable. Applies to reserved forests, village forests and protected forests.	MOEFCC / State Forest Department of Tamil Nadu	No	All projects/activities being conceptualized, developed, implemented or funded under output 1 are and will not be located within forest areas or depend on use of forest. For any tree cutting at proposed subprojects sites, due permission shall be obtained from the relevant district Forest Department of Tamil Nadu
Forest (Conservation) Act, 1980 Forest (Conservation) Rules, 2003	It provides for regulation to help conserve the country's forests. It restricts and regulates the de-reservation of forests or use of forest land for non-forest purposes without the prior approval of Central Government.	MOEFCC / State Forest Department of Tamil Nadu	Yes	All projects/activities being conceptualized, developed, implemented or funded under output 1 are and will not be not located within forest areas or depend on use of forest. For any tree cutting at proposed subprojects sites and/or along road easements, due permission shall be obtained from the relevant district Forest Department of Tamil Nadu

Act / Rule / Notification ³⁹	Brief	Regulator	Applicability to Output 1 / Remarks	
Indian Wildlife (Protection) Act, 1972, amended 1993 and Rules 1995; Wildlife (Protection) Amendment Act 2002	It provides for regulations to effectively protect the wildlife with a view to ensuring the ecological and environmental security of the country.	National / State Board for Wildlife	No	All projects/activities being conceptualized, developed, implemented and/or funded under output 1 do not fall within wildlife sanctuaries and/or national parks.
Wildlife Protection Strategy, 2002	The strategy document suggests measures and actions required for management of wildlife and protected areas if any activity lies within 10 km of wildlife sanctuaries or national parks.		No	All projects/activities being conceptualized, developed, implemented or funded under output 1 are not and will not be located within 10 km of wildlife sanctuaries and/or national parks
The Biodiversity Act, 2002 and Rules, 2004	Umbrella legislation aimed at conservation of biological resources and associated knowledge as well as facilitating access to them in a sustainable manner and through a just process.	State Biodiversity Board	Yes	As applicable to proposed subprojects under output 1
Wetlands (Conservation & Management) Rules, 2010	To provide for protection and management of wetlands in India and regulate the activities within wetlands	Central Wetlands Regulatory Authority / Designated Local State Authority / Forest Department	No	All projects/activities being conceptualized, developed, implemented and/or funded under output 1 are not and will not be located in or around wetlands. Note: Point Calimere wetland in Tamil Nadu's Nagapattinam district is a Ramsar notified wetland and not situated in close proximity to any of the proposed subproject locations.
Ancient Monuments And Archaeological Sites and Remains Acts, 1958; Rules, 1959 and Notification, 1992.	Act for better and effective preservation of the archaeological wealth of the country, on par with constitutional provisions. This Act provides for the preservation of ancient and historical monuments and archaeological sites and	Archaeological Survey of India (ASI)	Yes	Applicable to subprojects located in proximity of the protected monuments/ Sites; requires prior permission of ASI for undertaking works within 100-300 m of the boundary of the protected monuments ⁴³

⁴³ Refer to Table 1.3. key exclusion criteria and Table 1.4 environmental guidelines for subproject selection under output 1.

Act / Rule / Notification ³⁹	Brief	Regulator	Applicability to Output 1 / Remarks	
Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010	<p>remains of national importance, for the regulation of archaeological excavations and for the protection of sculptures, carvings and other like objects.</p> <p>Notifies 100 m around the monument as prohibited area and 100 to 300 m as regulated area for construction works; No excavation/construction work is allowed within 100m of boundary of the protected monument;</p>			In Tamil Nadu There are 413 centrally protected monuments in 27 districts of Tamil Nadu; most (153) are in Kanchipuram district followed by Pudukottai district (109).
Central Motor Vehicles Act, 1988	Standards for vehicular pollution and prevention control. The authority also checks emission standards of registered vehicles, collects road taxes, and issues licenses. In August 1997, the Pollution under Control Certificate (PUC) program was launched in an attempt to crackdown on the vehicular emissions in the States.	State Transport Department	Yes	All vehicles that will be used in construction of the subprojects shall comply with the PUC norms set down under this Act.
National Building Code (Bureau of Indian Standards), 2005 – Part IV: Fire and Life Safety	Imposes restrictions on construction of buildings in different fire zones; classifies buildings based on occupancy; and provides specifications for fire protection measures, evacuation of buildings.	State / Local bodies regulating development and building construction activities	Yes	As applicable to the subprojects under output 1

Act / Rule / Notification ³⁹	Brief	Regulator	Applicability to Output 1 / Remarks	
Minimum Wages Act, 1948	The employer is supposed to pay not less than the minimum wages fixed by appropriate government agency as per the provisions of this Act if the employment is a “scheduled employment” such as construction of Roads, Runways, Buildings.	Chief Labour Commissioner, Ministry of Labour and Employment	Yes	All construction / operation and maintenance workers should be paid not less than the stipulated wages under this Act.
Equal Remuneration Act, 1979	The Act provides for payment of equal wages for work of equal nature to male and female workers and for not making discrimination against genders.	Chief Labour Commissioner, Ministry of Labour and Employment	Yes	All construction / operation and maintenance workers should be paid not less than the stipulated wages under this Act.
Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979	Act is applicable to any establishment that employs 5 or more inter-state migrant workers through an intermediary (who has recruited workers in one state for employment at an establishment situated in another state).	Chief Labour Commissioner, Ministry of Labour and Employment	Yes	Contractor for subprojects to register with the Labour Department in case of hiring of inter-state migrant workers. Adequate and appropriate amenities and facilities to be provided to workers including housing, sanitation, portable water, medical aid, traveling expenses from home to work place, etc.
Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996	It regulates the employment and conditions of service of building and other construction workers and provides for their safety, health and welfare	Chief Labour Commissioner, Ministry of Labour and Employment	Yes	All projects/activities being implemented and/or funded under output 1 where cost of construction is more than ₹10 lakhs should take cognizance of the provisions of this Act, register establishments and provide for the construction workers in accordance with this Act
Building and Other Construction Workers Welfare Cess Act, 1996 and Rules, 1998	An Act to provide for the levy and collection of a cess on the cost of construction incurred by employers.	Chief Labour Commissioner, Ministry of Labour and Employment	Yes	All projects/activities being implemented and/or funded under output 1 loan where cost of construction is more than ₹10 lakhs shall take cognizance and comply with the provisions of this Act and pay cess accordingly
Workmen Compensation Act, 1923	It provides for payment of compensation by employers to their employees for injury by accident i.e., personal injury or occupational disease	Chief Labour Commissioner, Ministry of Labour and Employment	Yes	All projects/activities that are being implemented, operational and/or funded under output 1 that employ workmen for activities that are hazardous and have health and safety risks should take

Act / Rule / Notification ³⁹	Brief	Regulator	Applicability to Output 1 / Remarks	
				cognizance of this Act and ensure due compensation to employees in case of any injury or accident.
The Child Labour (Prohibition & Regulation) Act, 1986	It prohibits employment of children in certain specified hazardous occupations and processes and regulates the working conditions in others.	Chief Labour Commissioner, Ministry of Labour and Employment	Yes	All project/activities that are being implemented, operational and/or funded under output 1 will refrain from employment of children.
Public Liability Insurance Act 1991	Protection from hazardous materials and accident	Central Government / Government of Tamil Nadu	Yes	Applicable to proposed subprojects under output 1
The Factories Act, 1948; Tamil Nadu Factories Rules 1950 and amendments 2019 (draft)	The Act lays down the procedure for approval of plans before setting up a factory, health and safety provisions, welfare provisions, working hours and rendering information-regarding accidents or dangerous occurrences to designated authorities.	The Labour and Employment Department, Government of Tamil Nadu	Yes	Applicable to proposed subprojects under output
Indian Electricity Rules, 1956; amended 2000	It provides for regulating the supply, transmission, generation, and use of electricity which includes precautionary measures to be adopted in construction, installation and maintenance of transmission, distribution, generation and use of electricity.	State Designated Authority	Yes	As applicable to proposed subprojects and/or "Existing Facilities".
The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 and Rules, 2007	It recognizes and provides for forests rights and occupation in forest land by forest dwelling Scheduled Tribes and other traditional forest dwellers who are integral to the sustainability of the forest ecosystem.	Government of Tamil Nadu / State Level Monitoring Committee / Forest Rights Committee	No	All projects/activities being conceptualized, developed, implemented, operational and/or funded under output 1 are NOT within or in close proximity to forest areas or involve host communities that are Scheduled Tribes and Other Traditional Forest Dwellers.
National Environment Appellate Authority Act (NEAA) 1997	Grievances process and how they will be dealt with.	NEAA	Yes	Applicable to proposed subprojects under output 1

Act / Rule / Notification ³⁹	Brief	Regulator	Applicability to Output 1 / Remarks	
National Green Tribunal Act (NGT)	<p>The NGT provides an effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources including enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property and for matters connected therewith. NGT has jurisdiction over matters related to Water Act, 1974; Water Cess Act, 1977; Forest (Conservation) Act, 1980; Air Act, 1981; Environment (Protection) Act, 1986; Public Liability Insurance Act, 1991; and Biodiversity Act, 2002.</p> <p>Consequently, no other court will have jurisdiction over the matters related to environment falling under the above referred Acts. Being a dedicated tribunal for environmental matters with the necessary expertise to handle environmental disputes, NGT provides speedy justice (within 6 months). In Tamil Nadu, Chennai is one of the five places of sitting of the Tribunal (Southern Zonal Bench is located in Chennai). If not satisfied with the NGT decision, aggrieved party can approach the Supreme Court within the specified period of time. Matters relating to the Wildlife (Protection) Act, 1972 do not fall under the jurisdiction of NGT.</p>	NGT	Yes	Applicable to the subprojects under output 1

Table 2.2. Applicable State Regulatory Framework of Tamil Nadu

S. No.	Act / Rule / Notification ⁴⁴	Brief	Regulator	Applicability to the Sector Loan / Remarks	
	Tamil Nadu State Ground Water (Development and Management) Act, 2003	This Act is to protect groundwater resources and provide safeguards against groundwater overexploitation, and to ensure its planned development and management; notifies areas for development, regulation and control of groundwater; prohibits sinking of wells and groundwater transport in notified areas without prior permission of the designated authority; requires all wells to be registered.	Tamil Nadu Ground water Authority	Yes	Groundwater abstraction in any notified areas will be subject to the provisions of this Act.
	Tamil Nadu Minor Mineral Concession Rules, 1959 (amended upto 31 March 2005)	Applicable for sand mining, quarrying and borrow areas.	Government of Tamil Nadu Department of Geology and Mining	Yes	Any sand mining, quarrying activities for the subprojects will be subject to the provisions of these Rules
	Tamil Nadu Protection of Tanks and Eviction of Encroachments Act, 2007	An Act to provide measures for checking the encroachment, eviction of encroachment in tanks which are under the control and management of Public Works Department, protection of such tanks and for matters incidental thereto.	Government of Tamil Nadu, Public Works Department	Yes	Clearing of encroachments / regeneration works
	Tamil Nadu Hill Areas (Preservation of Trees) Act, 1955 and Amendment Act 1979; Tamil Nadu Preservation of Private Forest Act, 1949	Act regulates the cutting of trees and cultivation of land in hill areas of Tamil Nadu	Committee constituted under the Chairmanship of the concerned District Collector	Yes	As applicable to proposed subprojects.
	Tamil Nadu State Action Plan for Climate Change ⁴⁵	The Action plan proposes various strategies / focus area wise, for climate change adaptation.	Government of Tamil Nadu		Integrate climate risks and vulnerability in detailed engineering design of the

⁴⁴<http://moef.gov.in/environment/>

S. No.	Act / Rule / Notification ⁴⁴	Brief	Regulator	Applicability to the Sector Loan / Remarks	
					proposed housing units in line with ADB Guidelines for Climate Proofing for Water Supply and Sanitation Sector and Tamil Nadu State Action Plan for Climate Change.
	Tamil Nadu State Water Policy, 1994	Policy applies to all the water resources in the State for efficient water management, conservation and reuse. One of the goals of the State Policy is to provide adequate water for domestic uses and industry.	State Water Resources Department	Yes	All projects/activities being implemented, operated and/or funded under the sector loan will take cognizance of this Policy
	Tamil Nadu Water (Prevention and Control of Pollution) Rules, 1983	These Rules empower the SPCB of Tamil Nadu to- -appoint consulting engineers, if and when required for specific purposes -prescribe consent fee - Issue notice to industries for collection of waste/wastewater samples for analysis -make it mandatory for industries to report any accidents/hazards	Tamil Nadu Pollution Control Board	Yes	As applicable to proposed subprojects and/or “Existing Facilities”.
	Tamil Nadu Air (Prevention and Control of pollution) Rules, 1983	These Rules empower the SPCB of Tamil Nadu to- -appoint consulting engineers, if and when required for specific purposes -prescribe consent fee -make it mandatory for industries to report any accidents/hazards	Tamil Nadu Pollution Control Board	Yes	As applicable to proposed subprojects and/or “Existing Facilities”.
	Tamil Nadu Ancient and Historical Monuments and Archaeological Sites and Remains Act, 1966.	Empowers Government of Tamil Nadu to declare monuments and areas to be protected in Tamil Nadu; prohibit or restrict construction activities within or in close proximity to the protected and regulated areas	Tamil Nadu Department of Archaeology	Yes	Applicable to subprojects located in proximity of the protected monuments/ Sites; requires prior permission of ASI for taking works within 100-300 m of the boundary of

⁴⁵The Tamil Nadu State Action Plan for Climate Change identifies and deals with the following focus areas: Sustainable Agriculture (and allied sectors), Water Resources, Forest and Biodiversity, Coastal Area Management, Energy Efficiency, Renewable Energy and Solar Mission, Sustainable Habitat and Knowledge Management.

S. No.	Act / Rule / Notification ⁴⁴	Brief	Regulator	Applicability to the Sector Loan / Remarks	
	Tamil Nadu Building and Other Construction Workers' (Regulation of Employment and Conditions of Service) Act, 1996 and Rules, 2006	Regulates the employment and conditions of service of building and other construction workers and to provide for their safety, health and welfare measures; Provides various benefits for the registered workers	Chief Labour Commissioner	Yes	the protected monuments All projects/activities being implemented and/or funded under the sector loan shall take cognizance and comply with the provisions of this Act
	Tamil Nadu Combined Development and Building Rules, 2019	In order to simplify the rules and procedures relating to land development and building construction in the State of Tamil Nadu, the rules have been framed taking into account the need for more efficient and sustainable utilization of land, ensuring availability of land for various purposes, making housing more affordable and to enable greater compliance and effective enforcement of development and building guidelines. These rules are legal tools to regulate size, coverage, height and architectural design and construction aspects of buildings so as to achieve orderly development of an area.	Housing and Urban Development Department, Government of Tamil Nadu	Yes	As applicable to subprojects
	Tamil Nadu State Environmental Policy 2017	Formulated in line with the NEP 2006 with objectives to: Conserve, nurture and reserve environmental resources Integrate environmental well-being into development programmes Enhance preparedness to deal with impacts of climate change Improve environmental governance and institutional capacity	Department of Environment, Government of Tamil Nadu	Yes	As applicable to subprojects

C. Comparison of ADB SPS, 2009 Policy and National Environmental Regulatory Requirements

42. The GOI national environmental review and clearance procedures generally conform to the intent of ADB SPS 2009. Comparison of environment requirements as undertaken by ADB and the GOI regulatory authority are shown in Table 2.3. While ADB SPS 2009 environmental assessment requirements and India national legal requirements address the same topics, ADB SPS 2009 requirements are more detailed.

Table 2.3. Comparison of Environmental Safeguards Requirements of ADB and GOI

S. No	ADB	GOI	Gap	Tasks to bridge gaps to meet ADB SPS and the requirements of this EARF (By TNSCB)
Screening and Categorization				
	<ul style="list-style-type: none"> • Assigns categories based on potential adverse impacts: <ul style="list-style-type: none"> - Category A - EIA required (irreversible, diverse or unprecedented adverse environmental impacts) - Category B - IEE required - Category C - no environmental assessment required but a review of environmental implications is required - Category FI - ESMS is required 	<ul style="list-style-type: none"> • GOI EIA Notification (2006) sets screening criteria to classify new and expansion projects based on potential environmental impacts as follows: Category A, B1 and/or B2.⁴⁶ • The category determines the level of environmental assessment. 	<ul style="list-style-type: none"> • As per the GOI national regulatory framework, an EIA is mandatory for only eight types of project activities <ul style="list-style-type: none"> - Mining - power generation - primary processing - materials production and processing, - specific manufacturing and services sectors - building and construction 	<ul style="list-style-type: none"> • Subproject selection will be in line with this EARF, Table 1.2 and Table 1.4. • Use sector-specific REA and No Mitigation ('scoping') checklists for screening and categorization of each subproject at the earliest stage of project cycle. • If GOI EIA is triggered then approval will need to be obtained prior to contract award.⁴⁷

⁴⁶Under EIA Notification 2006 of GOI, the environmental classification of projects is determined by MOEFCC, GOI and there are two possible outcomes:

(i) **Category A:** A project or activity is classified as Category A if it is likely to have significant negative impacts and is thus one of the types of project listed in this category in the EIA Notification. Such projects require EIA, plus Environmental Clearance from MOEFCC; and

(ii) **Category B:** A project or activity is classified as Category B if it is likely to have fewer negative impacts and is listed in this category in the EIA Notification. These projects require EC from the SEIAA, who classify the project as B1 (requiring EIA) or B2 (not requiring EIA), depending on the level of potential impacts. Projects classified as B2 require no further study. Furthermore, the General Condition notes that "Any project or activity specified in Category 'B' will be treated as Category 'A', if located in whole or in part within 10 km from the boundary of: (i) Protected Areas notified under the Wild Life (Protection) Act, 1972; (ii) Critically Polluted areas as notified by the CPCB from time to time; (iii) ESZ as notified under section 3 of the Environment (Protection) Act, 1986, and (iv) Inter-State boundaries and international boundaries".

⁴⁷Selected sample subprojects that fall under the ambit of EIA Notification 2006 as Category B1 are Vallam, Reddiarpatti, Kalanivasal, Pallipalayam, and Oddukam; refer to Table 1.5 (column F).

S. No	ADB	GOI	Gap	Tasks to bridge gaps to meet ADB SPS and the requirements of this EARF (By TNSCB)
	<ul style="list-style-type: none"> Checklists prepared and completed by the project proponent to be submitted to ADB for concurrence or approval. 		<ul style="list-style-type: none"> Under each category, the threshold limits are specified when it is mandatory to conduct an EIA. 	-
Assessment of Potential Impacts				
	<p>For Category A or B projects:</p> <ul style="list-style-type: none"> Identify potential impacts on physical, biological, ecological and human environment in the context of project's area of influence (i.e., primary subproject site and supporting services, associated facilities) and audit of existing facilities 	<ul style="list-style-type: none"> Specific Terms of Reference (TOR) issued by the MOEFCC for eight type of projects that fall under purview of EIA Notification 2006 Undertake assessment of potential impacts as per TOR 	<ul style="list-style-type: none"> For the purposes of the sector loan, an assessment of potential impacts needs to be carried out. However, GOI framework does not prescribe detailed due diligence or environmental audit to check project Associated Facilities or Existing Facilities to determine whether they could cause, or is causing, environmental risks and impacts. 	<ul style="list-style-type: none"> Category A project / subproject excluded under the scope of the sector loan For Category B as per ADB SPS 2009. <ul style="list-style-type: none"> Define subproject area of influence that includes both the new development / resettlement sites and the existing encroachments. Conduct assessment of potential impacts Due diligence or environmental audit will be undertaken for any project Associated Facilities and/ or Existing Facilities Undertake appropriate studies for GOI EIA Category as per issued TOR
Preparation of Safeguards Plans and Documents and Obtaining Clearances / Approvals				

S. No	ADB	GOI	Gap	Tasks to bridge gaps to meet ADB SPS and the requirements of this EARF (By TNSCB)
	<ul style="list-style-type: none"> • Category B subprojects: <ul style="list-style-type: none"> - Draft and final IEE for selected sample subprojects in line with the EARF, ADB SPS 2009 and national and state regulatory requirements - Submit to ADB for approval and clearance 	<ul style="list-style-type: none"> • Draft and final GOI EIA studies prepared for Category A / B1 type projects <p>GOI Category A</p> <ul style="list-style-type: none"> • Requires prior Environmental Clearance from central Government in the MOEFCC through recommendation of Environmental Appraisal Committee (EAC). <p>GOI Category B</p> <ul style="list-style-type: none"> • Category B 1 projects require prior Environmental Clearance from SEIAA through recommendations of State Environmental Appraisal Committee (SEAC) • Category B2 does not require EIA, goes directly to Appraisal stage. 	<ul style="list-style-type: none"> • No gap 	<ul style="list-style-type: none"> • For Category B subprojects as per ADB SPS 2009. • For subprojects under output 1, draft IEE will be prepared taking detailed design considerations such as the layout / floor plan, site geo-tech investigations outcomes, site water quality analysis, site topo-survey details / contour gradients, and KMZ/KML files that will be cleared by the TNSCB. In absence of detailed design, a draft IEE can be prepared based on preliminary design and then submitted to ADB for review and approval. Following the detailed design, a final IEE should be prepared and submitted for ADB review and approval prior to any contract award. In both cases, recommendations from the IEE such as key environmental considerations in subproject layout, design or technical specifications can further be integrated into the detailed design. • Obtain environmental clearance for assigned Category type subproject

S. No	ADB	GOI	Gap	Tasks to bridge gaps to meet ADB SPS and the requirements of this EARF (By TNSCB)
				<p>from the MOEFCC / SEIAA</p> <ul style="list-style-type: none"> Also obtain applicable permits / approvals from relevant National, State and/or Local authorities. All statutory clearances must be obtained prior to contract award.
Analysis of Alternatives				
	<ul style="list-style-type: none"> For projects with potential significant adverse impacts (i.e., Category A) Also considered for Category B projects Examine alternatives to the project's location, design, and technology 	<p>Compares feasible alternatives to the proposed projects site, technology, design and operation including the "without project" situation in terms of their potential environmental impacts, the feasibility of mitigating these impacts, their capital and recurrent costs, their suitability under local conditions and abatement.</p>	<ul style="list-style-type: none"> No gap 	<ul style="list-style-type: none"> Analysis of alternatives including the "no project" scenario will be carried out.
Meaningful Consultation				
	<ul style="list-style-type: none"> Starts early and continues during implementation Undertaken in an atmosphere free of intimidation Gender inclusive and responsive Tailored to the needs of vulnerable groups Allows for the incorporation of all relevant views of stakeholders 	<ul style="list-style-type: none"> Public consultation required to be undertaken through public notice prior to the approval by the MOEFCC only for Category A and B1 type projects, none for sub-category 8(a) and 8 (b) . 	<ul style="list-style-type: none"> The public consultation as per GOI mandate starts at a later stage in the project cycle while under ADB SPS it starts early in the project cycle and continues throughout project implementation. 	<ul style="list-style-type: none"> Initiate meaningful consultations at the earliest stage of the project cycle and continue during implementation. Integrate findings from consultations into subproject detailed design.
Information Disclosure				

S. No	ADB	GOI	Gap	Tasks to bridge gaps to meet ADB SPS and the requirements of this EARF (By TNSCB)
	<p>ADB will post in its website the following:</p> <ul style="list-style-type: none"> - Draft EARF / IEE prior to loan appraisal - Final or updated IEE upon receipt (due to change in scope or subproject detailed design) - Corrective action plan prepared during subproject implementation, if any - Environmental monitoring reports (quarterly monitoring and progress reports / annual monitoring reports submitted by the TNSCB upon receipt⁴⁸ 	<ul style="list-style-type: none"> • Information disclosure required to be undertaken through public notice prior to the approval by the MOEFCC only for Category A and B1 projects. • This process is known as “public hearing”. 	<ul style="list-style-type: none"> • No gap 	<ul style="list-style-type: none"> • Follow information disclosure requirements as per ADB SPS 2009 as set out in Section 5 of this EARF • Follow information disclosure requirements as per GOI mandate
Grievance Redress Mechanism				
	<p>Establish a mechanism to receive and facilitate resolution of grievances or complaints</p>	<p>Grievance redress mechanism is not mentioned in the regulations</p>	<p>Gap</p>	<p>To comply with ADB SPS 2009, a project specific mechanism for redressal will be set up as described in Section 5 of this EARF.</p>
Use of Environmental Standards				
	<ul style="list-style-type: none"> • Refers to IFC (WBG) EHS 2007 • If national regulations differ from the above, more stringent standards will be followed • If less stringent levels are appropriate in view of specific project circumstances, provide full and detailed justification 	<ul style="list-style-type: none"> • The Central Pollution Control Board (CPCB) standards are followed as per law for all projects • The Environment (Protection) Rules, 1986 - Various legislations addressing aspects such as air and water pollution, hazardous substance 	<ul style="list-style-type: none"> • The limiting value of some pollutants specified in the GOI regulatory standards maybe different than those specified in IFC EHS 2007 guidelines and hence some gaps in certain situations. 	<ul style="list-style-type: none"> • For purpose of applicability of environmental standards, the most stringent environmental standards to be followed. • The environmental standards that will apply to the subprojects has been set out in Section 2of this EARF.

⁴⁸ Environmental reporting will be on quarterly and annual basis during construction and operation stages up to the end period of the sector loan.

S. No	ADB	GOI	Gap	Tasks to bridge gaps to meet ADB SPS and the requirements of this EARF (By TNSCB)
		management, etc. <ul style="list-style-type: none"> • Occupational health and safety standards included in the Factories Act (India) and various India specific Labor Laws 		
Procurement and Contract Award				
	No contract award until: <ul style="list-style-type: none"> - Environmental clearances by the SEIAA have been obtained - IEE and EMP has been finalized, cleared by ADB, and disclosed to public - IEE and EMP, other safeguard requirements are included in bidding documents and civil works contracts - EMP implementation is reflected in the Project Administration Manual. 	-	-	Follow steps for procurement and contract award as per ADB SPS 2009.
Monitoring and Reporting⁴⁹				
	<ul style="list-style-type: none"> • Prepare monitoring reports on the progress of IEE and EMP implementation • Prepare and implement corrective action plan if non-compliance is identified • Submit quarterly and annual monitoring reports to ADB for review and approval. • ADB supervision mission to 	<ul style="list-style-type: none"> • Post Environmental Clearance monitoring is stipulated by the regulations, with half yearly compliance reports to be made available as public documents • Latest report displayed on website of designated regulatory authority 	No gap	Follow steps for monitoring and reporting as per ADB SPS 2009 and GOI mandated rules. Monitoring and reporting requirements are set out in Section 6 of this EARF.

⁴⁹ Environmental reporting will be on quarterly and annual basis during construction and operation stages up to the end period of the sector loan.

S. No	ADB	GOI	Gap	Tasks to bridge gaps to meet ADB SPS and the requirements of this EARF (By TNSCB)
	review safeguards implementation			

D. Applicable International Standards and Best Practices

43. During the design, construction, and operation of the subprojects the TNSCB PMU will apply pollution prevention and control technologies and practices consistent with international standards and best practices, as reflected in internationally recognized standards such as the IFC's EHS Guidelines,⁵⁰ Guidance Notes and World Health Organization (WHO). These standards contain performance levels and measures that are normally acceptable and applicable to projects / subprojects. When GOI regulations differ from these levels and measures, the TNSCB PMU will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the TNSCB PMU will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS, 2009.

44. The following IFC (WBG) EHS and World Health Organization (WHO) Guidelines will be adopted in the EMP for the subprojects such as:

- (i) WHO Guidelines on Air Emissions and Ambient Air Quality, Noise Management, Wastewater and Ambient Water Quality,
- (ii) Guidelines for Construction and Decommissioning (2007)
- (iii) Guidelines for Hazardous Material Management and Waste Management
- (iv) Good Practice Note: Asbestos: Occupational and Community Health Issues, May 2009
- (v) Guidance Note on Workers Accommodation: Processes and Standards, August 2006⁵¹
- (vi) Guidelines on Occupational Health and Safety and Community Health and Safety (2007)

45. Comparison of national emissions standards and International Standards / Best Practices are provided in Table 2.4, Table 2.5 and Table 2.6. Due to different measuring conditions, the emission values are not directly comparable. However, IFC Guidelines / WHO standards are stricter than the national standards if converted to comparable values.

⁵⁰<http://www.ifc.org/ehsguidelines>

⁵¹[IFC Guidance Note: Workers Accommodation](#)

1. Air Quality

Table 2.4. National Ambient Air Quality Standards and WHO Guidelines

Parameter	Location ^a	National Ambient Air Quality Standards ^b	WHO Air Quality Guidelines ($\mu\text{g}/\text{m}^3$)		Applicable Per ADB SPS ^c ($\mu\text{g}/\text{m}^3$)
			Global Update 2005	Second Edition ^e 2000	
Particulate Matter PM10 ($\mu\text{g}/\text{m}^3$)	Industrial Residential, Rural and Other Areas	60 (Annual) 100 (24-hr)	20 (Annual) 50 (24-hr)	-	20 (Annual) 50 (24-hr)
	Sensitive Area	60 (Annual) 100 (24-hr)	20 (Annual) 50 (24-hr)	-	20 (Annual) 50 (24-hr)
Particulate Matter PM25 ($\mu\text{g}/\text{m}^3$)	Industrial Residential, Rural and Other Areas	40 (Annual) 60 (24-hr)	10 (Annual) 25 (24-hr)	-	10 (Annual) 25 (24-hr)
	Sensitive Area	40 (Annual) 60 (24-hr)	10 (Annual) 25 (24-hr)	-	10 (Annual) 25 (24-hr)
Sulfur Dioxide SO2 ($\mu\text{g}/\text{m}^3$)	Industrial Residential, Rural and Other Areas	50 (Annual) 80 (24-hr)	20 (24-hr) 500 (10-min)	-	50 (Annual) 20 (24-hr) 500 (10-min)
	Sensitive Area	20 (Annual) 80 (24-hr)	20 (24-hr) 500 (10-min)	-	20 (Annual) 20 (24-hr) 500 (10-min)
Nitrogen Dioxide NO2 ($\mu\text{g}/\text{m}^3$)	Industrial Residential, Rural and Other Areas	40 (Annual) 80 (24-hr)	40 (Annual) 200 (1-hr)	-	40 (Annual) 80 (24-hr) 200 (1-hr)
	Sensitive Area	30 (Annual) 80 (24-hr)	40 (Annual) 200 (1-hr)	-	30 (Annual) 80 (24-hr) 200 (1-hr)
Carbon Monoxide CO ($\mu\text{g}/\text{m}^3$)	Industrial Residential, Rural and Other Areas	2,000 (8-hr) 4,000 (1-hr)	-	10,000 (8-hr) 100,000 (15-min)	2,000 (8-hr) 4,000 (1-hr) 100,000 (15-min)

Parameter	Location ^a	National Ambient Air Quality Standards ^b	WHO Air Quality Guidelines ($\mu\text{g}/\text{m}^3$)		Applicable Per ADB SPS ^c ($\mu\text{g}/\text{m}^3$)
			Global Updated 2005	Second Edition ^e 2000	
	Sensitive Area	2,000 (8-hr) 4,000 (1-hr)	-	10,000 (8-hr) 100,000 (15-min)	2,000 (8-hr) 4,000 (1-hr) 100,000 (15-min)
Ozone (O ₃) ($\mu\text{g}/\text{m}^3$)	Industrial Residential, Rural and Other Areas	100 (8-hr) 180 (1-hr)	100 (8-hr)	-	100 (8-hr) 180 (1-hr)
	Sensitive Area	100 (8-hr) 180 (1-hr)	100 (8-hr)	-	100 (8-hr) 180 (1-hr)
Lead (Pb) ($\mu\text{g}/\text{m}^3$)	Industrial, Residential, Rural and Other Areas	0.5 (Annual) 1.0 (24-hr)	-	0.5 (Annual)	0.5 (Annual) 1.0 (24-hr)
	Sensitive Area	0.5 (Annual) 1.0 (24-hr)	-	0.5 (Annual)	0.5 (Annual) 1.0 (24-hr)
Ammonia (NH ₃) ($\mu\text{g}/\text{m}^3$)	Industrial Residential, Rural and Other Areas	100 (Annual) 400 (24-hr)	-		100 (Annual) 400 (24-hr)
	Sensitive Area	100 (Annual) 400 (24-hr)	-	-	100 (Annual) 400 (24-hr)
Benzene (C ₆ H ₆) ($\mu\text{g}/\text{m}^3$)	Industrial Residential, Rural and Other Areas	5 (Annual)	-	-	5 (Annual)
	Sensitive Area	5 (Annual)	-	-	5 (Annual)
Benzo(o)pyrene (BaP) (ng/m ³)	Industrial Residential, Rural and Other Areas	1 (Annual)	-	-	1 (Annual)
	Sensitive Area	1 (Annual)	-	-	1 (Annual)
Arsenic (As) (ng/m ³)	Industrial Residential, Rural and Other Areas	6 (Annual)	-	-	6 (Annual)
	Sensitive Area	60 (Annual)	-	-	60 (Annual)
Nickel (Ni) (ng/m ³)	Industrial Residential, Rural and Other Areas	20 (Annual)	-	-	20 (Annual)
	Sensitive Area	20 (Annual)	-	-	20 (Annual)

^a Sensitive area refers to Ecologically sensitive areas notified by the India Central Government.

^b http://cpcb.nic.in/uploads/National_Ambient_Air_Quality_Standards.pdf

^c As per ADB SPS, the government shall achieve whichever of the ambient air quality standards is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the executing agency of the government will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

^d WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide. *Global update 2005*. WHO. 2006.

^e Air Quality Guidelines for Europe Second Edition. WHO 2000.

2. Noise

Table 2.5. National Noise Standards and WHO Guidelines

Receptor/ Source	Noise Level Standards ^a (dBA)		WHO Guidelines Value		Applicable Per ADB SPS ^c (dBA)	
			For Noise Levels Measured Out of Doors ^b (One Hour LAeq in dBA)			
	Day	Night	07:00 – 22:00	22:00 – 07:00	Day time	Night time
Industrial area	75	70	70	70	70	70
Commercial area	65	55			65	55
Residential Area	55	45	55	45	55	45
Silent Zone	50	40			50	40

^a Noise Pollution (Regulation and Control) Rules, 2002 as amended up to 2010

(<http://cpcb.nic.in/displaypdf.php?id=Tm9pc2UtU3RhbmRhc mRzL25vaXNIX3J1bGVzXzlwMDAucGRm>)

^b Guidelines for Community Noise. WHO. 1999.

^c As per ADB SPS, the project proponent shall achieve whichever of the ambient air quality standards is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the project proponent will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS, 2009.

3. Water Quality

Table 2.6. National Drinking Water Quality Standards^a and WHO Guidelines

Group	National Standards for Drinking Water ^b		WHO Guidelines for		
	Parameter	Unit	Max. Concentration Limit	Drinking-Water Quality, 4th Edition, 2011 ^c	Applicable Per ADB SPS ^{d,e}
Physical	Turbidity	NTU	1 (5)	None in 4 th Edition	1 (5)
	pH		6.5 – 8.5	None established	6.5 – 8.5
	Colour	Hazen Units	5 (15)	None established	5 (15)
	Taste and Odour		Agreeable	None established	Agreeable
	TDS	mg/l	500 (2,000)	None established	500 (2,000)
	Iron	mg/l	0.3	None established	0.3
	Manganese	mg/l	0.1 (0.3)	None established	0.1 (0.3)
	Arsenic	mg/l	0.01 (0.05)	0.01	0.01
	Cadmium	mg/l	0.003	0.003	0.003
	Chromium	mg/l	0.05	0.05	0.05
	Cyanide	mg/l	0.05	None in 4 th Edition ⁵²	0.05
	Fluoride	mg/l	1 (1.5)	1.5	1 (1.5)
	Lead	mg/l	0.01	0.01	0.01
Chemical	Ammonia	mg/l	0.5	None established	0.5
	Chloride	mg/l	250 (1,000)	None established	250 (1,000)
	Barium	mg/l	0.7	1.3	0.7
	Sulphate	mg/l	200 (400)	None established	200 (400)
	Nitrate	mg/l	45	50	45
	Copper	mg/l	0.05 (1.5)	2	0.05 (1.5)
	Total	mg/l	200 (600)	None established	200 (600)

⁵² Cyanide value (mg/l) are not provided in the 4th Edition; hence "none" is indicated but nevertheless the WHO value is established at 0.07 mg/l in its 3rd Edition, 2008. Indian standard is more stringent.

Hardness					
Calcium	mg/l	75 (200)	None in 4 th Edition	75 (200)	
Zinc	mg/l	5 (15)	None established	5 (15)	
Mercury	mg/l	0.001	0.006	0.001	
Aluminium	mg/l	0.1 (0.3)	None established	0.1 (0.3)	
Anionic Detergents	mg/l	0.2 (1.0)	None in 4 th Edition	0.2 (1.0)	
Phenolic Compounds	mg/l	0.001(0.002)	2,4,6- trichlorophenol	0.001(0.002)	
Residual Chlorine	mg/l	0.2	5	0.2	
Microbial indicator	E-coli	MPN/100ml	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml Sample
	Total Coliform	MPN/100ml			

a <http://cgwb.gov.in/Documents/WQ-standards.pdf>

b Bureau of India Standard 10500: 2012 (Indian Standard, Drinking Water — Specification (Second Revision).

c Health-based guideline values. None established means there are no health-based guideline values

d As per ADB SPS, the government shall achieve whichever of the drinking quality standards is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the executing agency of the government will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS, 2009.

e Figures in parenthesis are maximum limits allowed in the absence of alternate source.

46. Standards for Sewage Treatment Plants (STPs) (Source: NGT (PB) Order dated 30.04.2019 in O.A. No. 1069/2018) is provided in Appendix 12.⁵³

47. The Guidelines for Reuse of STP effluent and sludge are provided in Appendix 13; (Source: Manual on Sewerage and Sewage Treatment Systems, CPHEEO, Ministry of Urban Development, Govt. of India)

48. The Central Pollution Control Board notifications and guidelines for operation of DG sets (that may be used for supporting services) are available at: <https://cpcb.nic.in/genset-notifications/>

4. Core Labor Standards

49. ADB is committed to due consideration of Core Labor Standards (CLS) in the design and implementation of subprojects. A CLS handbook has been developed by ADB with cooperation of International Labor Organization (ILO). The TNSCB PMU will ensure compliance to applicable CLS of ADB-ILO during project implementation including:⁵⁴

- (i) Freedom of association and the effective recognition of the right to collective bargaining
- (ii) Elimination of all forms of forced or compulsory labor
- (iii) Effective abolition of child labor
- (iv) Elimination of discrimination in respect of employment and occupation

⁵³Taken from: <https://tnpcb.gov.in/pdf/TNpcb&You2020.pdf>

⁵⁴Asian Development Bank and International Labor Organization. Core Labor Standards, October 2006.

5. ADB Prohibited Investment List

50. The Project will comply with ADB SPS 2009 Prohibited Investment Activities List (PIAL) Appendix 5; also listed in Table 2.7.

Table 2.7. ADB Prohibited Investment List

1. Production or activities involving harmful or exploitative forms of forced labour ⁵⁵ or child labour ⁵⁶
2. Production of or trade in any product or activity deemed illegal under host country laws or regulations or international conventions and agreements or subject to international phase outs or bans, such as pharmaceuticals ⁵⁷ , pesticides, and herbicides ⁵⁸ , (b) ozone-depleting substances ⁵⁹ , (c) polychlorinated biphenyls ⁶⁰ and other hazardous chemicals ⁶¹ , (d) wildlife or wildlife products regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora ⁶² , and (e) trans-boundary trade in waste or waste products ⁶³
3. Production of or trade in weapons and munitions, including paramilitary materials
4. Production of or trade in alcoholic beverages, excluding beer and wine ⁶⁴
5. Production of or trade in tobacco
6. Gambling, casinos, and equivalent enterprises
7. Production of or trade in radioactive materials ⁶⁵ , including nuclear reactors and components thereof
8. Production of, trade in, or use of un-bonded asbestos fibres ⁶⁶
9. Commercial logging operations or the purchase of logging equipment for use in primary tropical moist forests or old growth forests
10. Marine and coastal fishing practices such as large scale pelagic drift net fishing and fine mesh net fishing, harmful to vulnerable and protected species in large numbers and damaging to marine biodiversity and habitats.

E. International Agreements

51. India is a party and signatory to several international environmental agreements to which the MOEFCC is the national focal point. Key international agreements that India is signatory to are provided in Table 2.8. The interventions proposed under output 1 shall be implemented in compliance with applicable international conventions and declarations to which India is a party.

⁵⁵Forced labor means all work or services not voluntarily performed, that is, extracted from individuals under threat of force or penalty

⁵⁶Child labor means the employment of children whose age is below the host country's statutory minimum age of employment or employment of children in contravention of International Labor Organization Convention No. 138 "Minimum Age Convention". Information available at <https://www.ilo.org/global/lang-en/index.htm>

⁵⁷ List of pharmaceutical products subject to phaseouts or bans is available at <http://www.who.int>.

⁵⁸ A list of pesticides and herbicides subject to phaseouts or bans is available at <http://www.pic.int>.

⁵⁹ A list of the chemical compounds that react with and deplete stratospheric ozone resulting in the widely publicized ozone holes is listed in the Montreal Protocol, together with target reduction and phaseout dates. Information is available at <https://www.unenvironment.org/>

⁶⁰A group of highly toxic chemicals, polychlorinated biphenyls are likely to be found in oil-filled electrical transformers, capacitors, and switchgear dating from 1950 to 1985.

⁶¹ A list of hazardous chemicals is available at <http://www.pic.int/>

⁶² A list is available at <https://www.cites.org/>

⁶³ As defined by the Basel Convention; see <http://www.basel.int/>

⁶⁴ This does not apply to investee companies who are not substantially involved in these activities. Not substantially involved means that the activity concerned is ancillary to an investee company's primary operations.

⁶⁵ This does not apply to the purchase of medical equipment, quality control (measurement) equipment, and any equipment for which ADB considers the radioactive source to be trivial and adequately shielded.

⁶⁶ This does not apply to the purchase and use of bonded asbestos cement sheeting where the asbestos content is less than 20%.

Table 2.8. International Agreements, India

S. No.	International Agreements and Commitments	Brief Description	Remarks
Nature Conservation			
1	Convention on Wetlands of International Importance (Ramsar Convention) ⁶⁷	This convention was signed by India in 1981 and ratified in February 1982. The convention requires protection of identified wetlands of international importance as identified under Ramsar convention. Point Calimere wetland in Nagapattinam District is a Ramsar notified wetland.	Not triggered by output 1; key exclusion criteria and environmental guidelines for subproject selection will ensure that no subproject is located within or in close proximity to a sensitive natural receptor such as a wetland (refer to Table 1.3 and Table 1.4).
2	Convention on International Trade in Endangered Species of Fauna and Flora (CITES) ⁶⁸	This convention was signed by India in 1976. The Convention aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival.	Not triggered by output 1; subprojects do not involve any trade in specimens of wild animals and plants or threaten their survival.
3	The Wildlife Trade Monitoring Network (TRAFFIC) ⁶⁹	TRAFFIC works globally on trade in wild animals and plants in the context of both biodiversity conservation and sustainable development.	Not triggered by output 1; subprojects do not involve any trade in wild animals and plants
4	Convention on Migratory Species (CMS) ⁷⁰	India is contracting party to the convention on conservation of migratory species of wild animals and other species.	Not triggered by output 1, Key exclusion criteria and environmental guidelines for subproject selection will ensure that no subproject is located within or in close proximity to a sensitive natural receptor such that it may result in potential adverse impacts on migratory species (refer to Table 1.3 and 1.4)
5	Coalition Against Wildlife Trafficking (CAWT) ⁷¹	The GOI is represented in CAWT by the MOEFCC, which also manages Project Tiger.	Not triggered by output 1; subprojects are related to urban development and situated in urban / peri-urban areas with no direct or indirect anticipated

⁶⁷ Ramsar Convention is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. According to the Ramsar list of Wetlands of International Importance, there are 25-26 designated wetlands in India that are threatened; <https://south-asia.wetlands.org/>

⁶⁸ <https://www.cites.org/>

⁶⁹ <http://www.traffic.org/>

⁷⁰ CMS, also known as the Bonn Convention aims to conserve terrestrial, aquatic, and avian migratory species whilst recognizing that States must be the protectors of species living within or pass through their corresponding national jurisdictions. Hence, the Parties to the Convention adhere to strictly protecting such species, conserving or restoring the places where they live; <http://www.cms.int/>

⁷¹ <http://www.cawtglobal.org/india/>

S. No.	International Agreements and Commitments	Brief Description	Remarks
			impact to wildlife or activities that involve wildlife trafficking
6	Convention on Biological Diversity (CBD) ⁷²	India is a party since February 1994 by Ratification; and since September 2003 by Protocol.	Not triggered by output 1; no biodiversity impacts anticipated due to any of the subprojects. The subprojects will not be situated within or in close proximity to key biodiversity areas (refer to Table 1.3 and 1.4) and are situated in modified habitats.
7	International Tropical Timber Organization (ITTO) ⁷³	India is one of the participating Asia and Pacific Countries. ITTO was established under the auspices of the United Nations in 1986 amidst increasing worldwide concern for the fate of tropical forests; while establishing considerable agreement that the tropical timber trade was one of the keys to economic development in those same countries.	Not triggered by output 1; there are no tropical forests affected by the subprojects or any anticipated trade in tropical timber
8	United Nations Forum on Forests (UNFF) ⁷⁴	The UN Forum on Forests is an intergovernmental body to strengthen political commitment and action with main objective to promote "... the management, conservation and sustainable development of all types of forests and to strengthen long-term political commitment to this end." It was established in 2000.	Not triggered by output 1; subprojects are related to urban development and situated in urban / peri-urban areas with no direct or indirect anticipated impact to forests
9	International conventions such as the International Union for Conservation of Nature and Natural Resources (IUCN) ⁷⁵	The International Union for Conservation of Nature is the global authority on the status of the natural world and the measures needed to safeguard it.	Not triggered by output 1; The subprojects will not affect sensitive areas and is not expected to alter bird migration and/or affect any species on the IUCN list.

⁷²According to CBD, States, in accordance with the Charter of the United Nations and the principles of international law, have the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction. India is a party to the Cartagena Protocol on Biosafety to CBD which aims to ensure the safe handling, transport and use of living modified organisms resulting from modern biotechnology that may have adverse effects on biological diversity, taking also into account risks to human health; <http://www.cbd.int/convention/>

⁷³http://www.itto.int/sfm_detail/id=12390000

⁷⁴<http://www.un.org/esa/forests/index.html>

⁷⁵IUCN provides a comprehensive analysis of the global conservation status, trends, and threats to species viz the IUCN Red List or Red Data List. The IUCN Red list establishes a baseline from which to monitor the change in status of species; provides a global context for the establishment of conservation priorities at the local level; and on a

S. No.	International Agreements and Commitments	Brief Description	Remarks
10	Global Tiger Forum (GTF)	The GTF highlights the rationale for tiger preservation and provide leadership and common approach throughout the world in order to safeguard the survival of the tiger, its prey and its habitat. The Forum was conceived in New Delhi India in the 1990s.	Not triggered by output 1; subprojects will not be located in close proximity to any tiger reserves in Tamil Nadu (refer to Table 1.3 and 1.4).
11	UNESCO World Network of Biosphere Reserves (WNBR)	UNESCO has introduced the Designation 'Biosphere Reserve' for natural areas to minimize conflict between development and conservation, and established this network under the Man and Biosphere (MAB) Program, which currently composed of 669 biosphere reserves in 120 countries, including 16 transboundary sites. It works to foster the harmonious integration of people and nature for sustainable development through participatory dialogue, knowledge sharing, poverty reduction, human well-being improvements, respect for cultural values and by improving society's ability to cope with climate change. It promotes collaboration and represents a unique tool for international cooperation and the promotion of best practices. There are 18 biosphere reserves in India, of which 8 are designated by UNESCO in WNBR. There are 3 biosphere reserves in Tamil Nadu.	Following three Biosphere Reserve (BR) in Tamil Nadu are part of WNBRs - Nilgiris BR, spread in 3 states of Tamil Nadu, Kerala and Karnataka and consists of core and buffer zones -Gulf of Mannar BR – located at south eastern tip of India and covers an area of 10,500 km ² of ocean, 21 islands and the adjoining coastline. -Gulf of Mannar BR – located at south eastern tip of India and covers an area of 10,500 km ² of ocean, 21 islands and the adjoining coastline. -Agasthyamalai BR is spread in states of Tamil Nadu and Kerala -Not triggered by output 1; The subprojects will not be situated within or in close proximity to key biodiversity areas or BRs (refer to Table 1.3 and 1.4).
Hazardous Material			
12	Cartagena Protocol on Biosafety ⁷⁶	The Cartagena Protocol on Biosafety to the Convention on Biological Diversity is an international agreement which aims to ensure the safe handling, transport and use of living modified organisms (LMOs) resulting from modern biotechnology that may have adverse effects on biological diversity, taking also into account risks to human health. It was adopted on 29 January 2000 and entered into force on 11 September 2003. India signed the Protocol in 2000 and it came into force in 2003.	Not triggered by output 1; the subprojects do not involve safe handling, transport and use of LMOs
13	Strategic Approach	SAICM is a policy framework to promote	Any chemicals handled

continuous basis, monitor the status of a representative selection of species (as biodiversity indicators) that cover all the major ecosystems of the world. <https://www.iucnredlist.org/>

⁷⁶<https://bch.cbd.int/protocol>

S. No.	International Agreements and Commitments	Brief Description	Remarks
	to International Chemicals Management (SAICM) ⁷⁷	chemical safety around the world, with an overall objective to achieve the sound management of chemicals throughout their life cycle so that, by 2020, chemicals are produced and used in ways that minimize significant adverse impacts on human health and the environment. This “2020 goal” was adopted by the World Summit on Sustainable Development in 2002 as part of the Johannesburg Plan of Implementation.	during implementations of output 1 will be as per the detailed subproject EMP and localized and temporary.
14	Stockholm Convention on Persistent Organic Pollutants (POPs) ⁷⁸	The Stockholm Convention on Persistent Organic Pollutants (POPs): Mindful of the precautionary approach as set forth in Principle 15 of the Rio Declaration on Environment and Development, the Objective of POPs is to protect human health and the environment from persistent organic pollutants	Not triggered; the subprojects will not employ the use of POPs such as Pesticides: aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex, toxaphene; Industrial chemicals: hexachlorobenzene, polychlorinated biphenyls (PCBs); and. By-products: hexachlorobenzene; polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (PCDD/PCDF), and PCBs.
15	Basel Convention on the Control of Trans-boundary Movement of Hazardous Waste and Their Disposal ⁷⁹	The Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal was adopted on 22 March 1989 by the Conference of Plenipotentiaries in Basel, Switzerland, in response to a public outcry following the discovery, in the 1980s, in Africa and other parts of the developing world of deposits of toxic wastes imported from abroad. The overarching objective of the Basel Convention is to protect human health and the environment against the adverse effects of hazardous wastes. Its scope of application covers a wide range of wastes defined as “hazardous wastes” based on their origin and/or composition and their characteristics, as well as two types of wastes defined as “other wastes” - household waste and incinerator ash.	No trans boundary movement of hazardous wastes expected in any subproject under output 1
16	Rotterdam Convention on Prior	The Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain	No international trade of hazardous chemicals and

⁷⁷<http://www.saicm.org/>

⁷⁸<http://chm.pops.int/Home/tabid/2121/mctl/ViewDetails/EventModID/871/EventID/407/xmid/6921/Default.aspx>

⁷⁹<http://www.basel.int/TheConvention/Overview/tabid/1271/Default.aspx>

S. No.	International Agreements and Commitments	Brief Description	Remarks
	Informed Consent (PIC) for certain Hazardous Chemicals and Pesticides in International Trade	Hazardous Chemicals & Pesticides in international Trade was adopted by India at the Conference of Plenipotentiaries at Rotterdam in 1998	pesticides expected in any subproject under output 1.
Atmospheric Emissions			
17	United Nations Framework Convention on Climate Change (UNFCCC), 1992		Climate change risks and vulnerability will be considered in subproject design and implementation.
18	Kyoto Protocol	The Kyoto protocol was signed by India in August 2002 and ratified in February 2005. The convention pertains to the United Nations framework on Climate Change. The 3rd Conference of the Parties to the Framework Convention on Climate Change (FCCC) in Kyoto in December 1997 introduced the Clean Development Mechanism (CDM) as a new concept for voluntary GHG emission reduction agreements between industrialized and developing countries on the project level.	
19	Paris Agreement	The Paris Agreement was ratified by India on 2 October 2016. The agreement entered into force on 4 November 2016, thirty days after the date on which at least 55 Parties to the Convention accounting in total for at least an estimated 55 % of the total global GHG emissions have deposited their instruments of ratification, acceptance, approval or accession with the Depositary.	
20	United Nations Convention to Combat Desertification (UNCCD) ⁸⁰	Convention to combat desertification and mitigate the effects of drought through national action programs that incorporate long-term strategies supported by international cooperation and partnership arrangements.	Not triggered by output 1; there is no expected major change in natural habitat due to any of the subprojects
21	Montreal Protocol (on Ozone Depleting Substances)	India signed the Montreal Protocol along with its London Amendment on 17-9-1992 and also ratified the Copenhagen, Montreal and Beijing Amendments on 3rd March, 2003.	Not triggered by output 1; the subprojects will not employ the use of chlorofluorocarbons (CFCs), halons or transitional chemicals such as hydrochlorofluorocarbons (HCFCs)
Marine Environment			

⁸⁰<http://www.unccd.int/en/Pages/default.aspx>

S. No.	International Agreements and Commitments	Brief Description	Remarks
22	International Whaling Commission (IWC)	The IWC is the global body charged with the conservation of whales and the management of whaling. The IWC currently has 88 member governments from countries all over the world. The Commission's role has expanded since its establishment in 1946. In addition to regulation of whaling, today's IWC works to address a wide range of conservation issues including bycatch and entanglement, ocean noise, pollution and debris, collision between whales and ships, and sustainable whale watching.	Not applicable
Cultural Heritage			
23	Convention on Protection of the World Culture and Natural Heritage, 1972	Adopted by UNESCO in 1972. Signatory countries pledge to conserve the cultural and natural sites within their borders that are recognized by the Convention as being of exceptional and universal value. In return, the international community helps to protect these treasures. India is a signatory to the convention. To define these significant sites the Convention as established the World Heritage List. There are 35 (27 cultural, 7 natural, and 1 mixed) World Heritage Sites in India	Any subproject activities in close proximity to any heritage sites shall comply with the comprehensive management plan of such site and prescribe to the conditions set forth in Table 1.3 and Table 1.4 (also refer to Appendix 3 - EMP)

Source: MOEFCC, India

F. Institutional Capacity

1. Current Institutional Set up

52. Housing and Urban Development Department (HUDD), Government of Tamil Nadu⁸¹ is the project EA. HUDD formulates and implements various policies, programmes and schemes for the housing and urban development sector in Tamil Nadu. The department takes note of the changing socio-economic scenario of urban areas, the growing requirement for affordable housing and related infrastructure and need to promote harmonious and sustainable urbanization in formulating policies and schemes as guided by the "Vision Tamil Nadu 2023". This vision is aligned with Sustainable Development Goals (SDG 11)⁸². HUDD is the administrative authority of: Tamil Nadu Housing Board, TNSCB, Registrar of Co-operative Societies (Housing), DTCP, and the Chennai Metropolitan Development Authority as well as the Real Estate Regulatory Authority and the Real Estate Appellate Tribunal. With its large mandate and broad experience, HUDD has the requisite experience for the management of the sector loan.

⁸¹<https://www.tn.gov.in/department/15>

⁸²<https://in.one.un.org/page/sustainable-development-goals/sdg-11/>

53. Tamil Nadu Slum Clearance Board (TNSCB) is the project IA for output 1. TNSCB was established in September 1970 in Chennai and starting in 1984 it gradually extended to other urban areas of Tamil Nadu in a phased manner. The Board has been implementing various housing, slum development and rehabilitation and resettlement programmes to ameliorate the living conditions of the slum families in Tamil Nadu. The main mandate of the Board is to facilitate rehabilitation of slum encroachers in objectionable government land and it executes various programmes keeping the following broad strategies under its purview:

- (i) Protection of slum families from natural hazards / calamities like fire, floods, etc.
- (ii) Each housing tenement built will have a multipurpose room, bedroom, kitchen, an independent toilet, with water supply and sewerage arrangements.
- (iii) Paved access, streetlight, surface drain will be provided.
- (iv) The slums located in unobjectionable areas, wherein equitable distribution of space to all is not feasible, will be cleared and housing tenement schemes put up.

54. The TNSCB is the designated State level nodal agency for the implementation of the PMAY-HFA Mission in the State.⁸³TNSCB organizational structure is provided as Figure 3. The Board is comprised of technical and non-technical staff. There are procedures adopted by the Board for rehabilitation of slum encroachers in objectionable government lands or water bodies as stipulated by various Board resolutions. The procedures follow initial identification of encroachers, site surveys and collection of data, selection of resettlement site and obtaining permits and approvals. Consultations are also conducted; however later in the cycle.⁸⁴

55. **Existing Grievance Redress System.** There are various methods adopted by the Board for grievance redress for slum encroachers or the general public affected by TNSCB activities; these are structured to facilitate ease in submitting a grievance by any affected person / aggrieved petitioner and redress the grievances in an expeditious, fair and sympathetic manner. Details are as follows, however timelines for resolutions are not known:

56. **Submission of Grievance Petitions in Division Office.** The residents of the TNSCB tenements submit the grievance petitions pertaining to maintenance, repairs and renewal works of tenements, , etc. are forwarded to the Superintending Engineers and Executive Engineers⁸⁵. The Executive Engineers through the Assistant Executive Engineers and the Assistant Engineers / Junior Engineers redress the grievances submitted by the residents of the tenements.

57. **Public Grievance Redressal Centre in Board Office, Chennai.** The public submits the grievance petitions in the Public Redressal Centre located in the Board Office. The petitions are forwarded to the concerned Superintending Engineer, Executive Engineer or the Estate Officer for redressal. The reply to the petitioner is sent after the redressal of grievance.

58. **Submission of Grievance Petitions to the Managing Director, TNSCB.** The Managing Director, TNSCB meets the public daily to receive the grievance petitions. The

⁸³Pradhan Mantri Awas Yojana – “Housing for All” (Urban)

⁸⁴As per discussions with the Community Development Officer of the TNSCB during field visits, it was understood that meetings with intended beneficiaries are conducted only 3 to 4 months prior to the actual physical removal of the encroachments; beneficiaries are not involved in site selection that may correspond to their livelihood generation activities or in site planning.

⁸⁵There are 18 Divisions in TNSCB each headed by an Executive Engineer; the Executive Engineer maintains the tenements of TNSCB within the jurisdiction of the Division.

petitions are forwarded to the concerned Superintending Engineer, Executive Engineer or the Estate Officer for redressal. The reply to the petitioner is sent after the redressal of grievance.

59. **Online Grievance Redressal System of TNSCB in Chennai City.** The Online Grievance Redressal System of TNSCB is functioning in Chennai City. The grievance petitions received in the Board office are forwarded online to the concerned Divisions and redressal of grievances are monitored.

60. **Chief Minister's Special Cell.**⁸⁶ The Grievance petitions are filed online through CM's Special Cell portal by the affected person / aggrieved petitioner. The filed grievances related to TNSCB are forwarded to the Public Relations Officer, TNSCB. For the Divisions within Chennai, the copy of the petition is sent to the concerned Division Executive Engineer. For the divisions outside Chennai, the scanned copy of the grievance petition is forwarded through Division Office's email and a copy is dispatched through post for immediate redressal of the Grievance to the Division Executive Engineer. After resolving the grievances, the Executive Engineer / Estate Officer sends the reply to the affected person / aggrieved petitioner and the copy of the same is communicated to the Public Relations Officer at TNSCB. On the receipt of the same, the Public Relations Officer closes the grievances through the online portal of the Chief Minister's Special Cell.

61. **Amma Call Centre.**⁸⁷ Amma Call Centre 24/7 is a single window IT enabled facility of government of Tamil Nadu that acts as an intermediary between citizens and government to enable the expeditious disposal of grievances of Citizens through toll free number 1100. Process flow is as follows:

- (i) Petitioner to call the toll-free number 1100
- (ii) AMMA Call Centre associate to register the grievance / petition
- (iii) Two messages will be triggered simultaneously at once grievance is registered:
 - (a) One message to the petitioner acknowledging the registration of the grievance along with a unique reference number.
 - (b) Second message to the respective Grievance Redressal Officer (GRO) who is the Public Relations Officer (PRO) of TNSCB Board Office with petitioner's contact number and nature of the grievance.
- (iv) There is a portal exclusively allotted to a Grievance Nodal Officer, with a unique user ID and Password. The Grievance Nodal Officer keeps track of the grievances received every day and grievances that are resolved are updated in that exclusive portal.
- (v) The complaints received from the Amma Call Centre are forwarded to the concerned Division officials and after redressal of grievances the details are updated in the Online Portal at the Board office.

62. Petitions received during the Grievance Redressal Day. The District Collector conducts Grievance Redressal Day on every Monday of the week. The grievance petitions related to TNSCB are forwarded by the District Collector office to the concerned Division Executive

⁸⁶Chief Minister's Special Cell functions as the Hon'ble Chief Minister's Grievance Redressal forum open to public from all walks of life. The petitions are sent to the respective Departments and replies are fed into the online monitoring system. The Departments have been sensitized on the necessity for prompt and effective disposal of the petitions. Review meetings are routinely convened with the nodal officers of each Department/ District so that offices that show delays in grievance resolution are made accountable. Web-link: <http://cmcell.tn.gov.in/>

⁸⁷ Web-link: <http://www.ammacallcentre.tn.gov.in/>

Engineer, TNSCB. The Executive Engineer redresses the grievance and send a reply to the petitioner and submit a copy to the Collector's Office to close the complaints. The complaints received during the Grievance Day are monitored by the Collector's Office.

2. Institutional Capacity for Environmental Safeguards

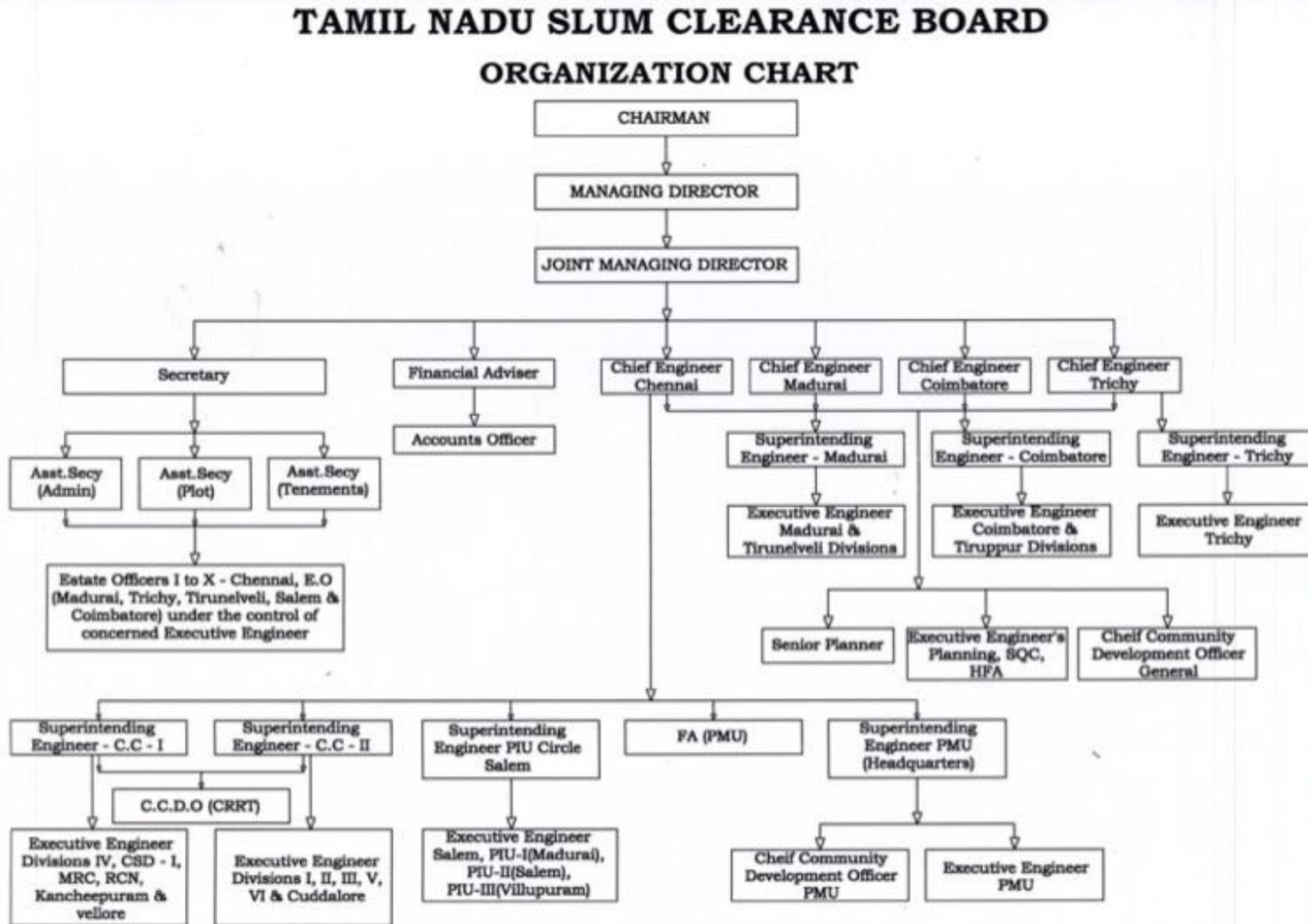
63. Consideration of safeguard aspects at the TNSCB is currently limited to compliance with GOI regulations as per the national legal and regulatory framework and obtaining necessary clearances / approvals. Consequently, at present, there is no institutional set-up within the IA to specifically deal with environmental safeguards aspect. Therefore, the IA capacity needs to be strengthened with appointment of dedicated and trained staff and consultancy support in handling safeguards tasks to ensure EARF compliance in subproject preparation and implementation.

64. TNSCB will have a Project Management Unit (PMU) at headquarters and a total of three (3) Project Implementation Divisions (PIDs) with dedicated staff within its Environment team / cell; the PIDs will be at Madurai, Salem and Villupuram that will oversee implementation of all selected sample subprojects under output 1; see jurisdictions under each PID below. There will also be a Project Implementation Unit Circle (PIC) that oversees the PIDs. The Institutional Roles and Responsibilities for subproject implementation are provided in Section 6 of this EARF.

S No	Divisions	Headquarters	Jurisdiction of Districts
1	PID I	Madurai	Dindigul, Tirunelveli, Sivaganga and Theni
2	PID II	Salem	Salem, Namakkal, Erode and Coimbatore
3	PID III	Villupuram	Nagapattinam, Tiruvarur, Mayiladuthurai, Thanjavoor, Ariyalur, Cuddalore, Kallakuruchi and Villupuram

65. The TNSCB has developed an Environmental Management Framework (EMF), approved by the Board and submitted to ADB on March 2020 that will be applicable to all EWS housing projects of TNSCB with > 20,000 square-meter and < 1,50,00 square-meter of built-up area as per GOI EIA Notification 2006. When the project EARF measures differ from the TNSCB EMF, the TNSCB PMU and PIDs will achieve whichever is more stringent.

Figure 3: TNSCB Organizational Structure



III. ANTICIPATED ENVIRONMENTAL IMPACTS

A. Project Benefits

66. This project is expected to have significant environmental benefits as each subproject design under output 1 will include protection and future regeneration of water bodies and surrounding areas in the relocated project beneficiaries / household's previous location.

67. The works for new buildings construction and for protecting the cleared encroachments including the re-greening of banks can provide temporary construction employment for project beneficiaries/ resettled households and provide an initial market for transport and small-scale economic services.

68. Moreover, this project is expected to realize significant social benefits due to incorporation of the graduation approach in the resettlement of project beneficiaries/resettled households which will focus on four key areas: (i) social assistance to support immediate needs such as subsistence and health services during transition in the relocation site; (ii) livelihood promotion through localized market assessment and household-level enterprise/employment matching; (iii) financial inclusion through financial literacy and improving access to savings and financial services to promote economic resilience; and (iv) social empowerment by improving social dynamics, including gender relations, in the families and communities.⁸⁸ This project will also be supported by the Seoul Housing and Communities Corporation (SH), with respect to: (i) guidance on improving building layouts and plans for dwelling units to incorporate project beneficiary choices; (ii) capacity building, and (iii) support for operations and maintenance planning, including an O&M manual.

B. Potential Adverse Impacts

69. The detailed description of potential adverse environmental impacts of selected sample subprojects is presented separately in each of the subproject IEEs including EMPs. Appendix 3 illustrates the potential anticipated adverse impacts on physical, environmental, ecological resources and the human environment across all stages of project cycle. These identified potential adverse environmental impacts will be managed through effective implementation of the subproject IEE and EMP including site specific EMPs for work activities such as construction, demolition and regeneration (Construction EMP (C-EMP) / Demolition works EMP (D-EMP) / Regeneration works EMP (R-EMP)) and/or individual sub-plans specified in the subproject EMP, Standard Operation & Maintenance Plans (SOMPs) / O&M-EMP as well as appropriate capacity building measures for PMU, PIDs, project staff and contractors. Compensation for lost assets will be captured in the project Resettlement Framework / Entitlement Matrix and in the subproject social due diligence reports and resettlement plans.

⁸⁸Through, among others, developing positive attitudes, upholding participatory decision making, improving children's enrollment in schools, promoting health and wellness, implementing youth development programs, and setting up participatory mechanisms for addressing gender-based domestic violence and managing community disputes.

IV. ENVIRONMENTAL ASSESSMENT PROCESS TO BE FOLLOWED FOR SUBPROJECTS

A. Environment Category

70. Output 1 of IRSHUPSP has been classified as Category B based on the environmental assessment undertaken for five selected sample subprojects (refer to discussion in Section 1.6); the subproject IEEs and EMPs are under preparation in accordance with requirements of ADB SPS 2009 and drafts are due to be completed by December 2020. Overall, the subprojects will have only small-scale, localized impacts on the environment; the potential adverse environmental impacts are mainly due to construction, which can be minimized / mitigated by proven measures and environmentally sound engineering and construction practices. The subsequent subprojects will seek to replicate the selected sample subprojects and are thus expected to be category B. No category A subprojects (with potential significant adverse environmental impacts that are irreversible, diverse or unprecedented) will be considered for implementation under output 1.

71. The TNSCB will set up a PMU (Environment Team) and PIDs (Environment Cell) with dedicated consultants and staff that will undertake environmental assessment process of individual subprojects under output 1 in accordance with the requirements of this EARF and ADB SPS 2009 as presented in the following Section. Section 6 of this EARF summarizes the safeguards implementation procedures with roles and responsibilities.

B. Selection of Subprojects as per Guidelines

72. Exclusion Criteria. All subprojects proposed under output 1 will be screened against key exclusion criteria listed in Table 1.3. No Category A projects will be considered for implementation.

73. Environmental Guidelines for Subproject Selection. Environmental guidelines listed in Table 1.4 will be followed during the identification and finalization of subprojects prior to additional analysis.

C. Environmental Assessment Process for Each Subproject

1. Screening and Categorization

74. As soon as sufficient information on a subproject is available, the PIDs (Environment Cell) with support of PMU (Environment Team) will undertake screening using the ADB's rapid environmental assessment (REA) checklist (refer to Appendix 4) and No Mitigation Scenario (Scoping) checklist (refer to Appendix 5) to determine the subproject environmental category. Requirements as per the GOI regulations (clearances, approvals, consent etc.) will also be identified at this stage, including the requirement for Environmental Clearance as per the EIA Notification, 2006. Checklists will be submitted to PMU (Environment Team) and ADB for review and concurrence.

75. The PIDs (Environment Cell) will adhere to the requirements listed in Table 1.3 and Table 1.4 and the following safeguards policy principles as a standard practice for environmental assessment and integrate into the subproject design, construction and operation:

- (i) **Management and Use of Renewable Natural Resources.**⁸⁹ Renewable natural resources will be managed in a sustainable manner. This includes applying a precautionary approach to safeguard the life-supporting capacity of air, water, and soil ecosystems.
- (ii) **Critical and Natural Habitat.** ADB SPS 2009 does not allow implementation of subprojects in areas of critical and natural habitats or high biodiversity unless specific conditions are met. Such habitats / areas will not be considered and are excluded (refer to Exclusion criteria in Table 1.3)
- (iii) **Pollution Prevention and Abatement.** During the design, construction, and operation of the subproject, apply pollution prevention practices and control technologies consistent with International Best Practices reflected in internationally recognized standards of the IFC (WB) EHS Guidelines⁹⁰ and relevant national environment related standards. These standards contain performance levels and measures that are normally acceptable and applicable to subprojects. When GOI regulations differ from these levels and measures, the TNSCB PMU (Environment Team) will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific subproject circumstances, the TNSCB PMU (Environment Team) will provide full and detailed justification for any proposed alternatives that will meet the requirements in ADB SPS 2009.
- (iv) **Health and Safety.** The TNSCB PMU (Environment Team) will apply preventive and protective measures consistent with International Best Practices reflected in internationally recognized standards of the IFC (WB) EHS Guidelines on Occupational Health and Safety, Community Health and Safety, Guidance Note on Workers Accommodation as well as relevant national legislation.
- (v) **Physical Cultural Resources.** The TNSCB PMU (Environment Team) will site and design the subprojects to avoid PCRs and establish “chance find” procedures. For any subproject activity that may affect PCRs e.g., local heritage sites / archaeological sites, places of worship, etc., all applicable ADB SPS 2009 requirements shall be followed. In such cases, TNSCB shall (i) confirm that no alternatives to removal are available; (ii) prepare a heritage impact assessment outlining appropriate mitigation measures that complies with the comprehensive management plan of such site; (iii) conduct a detailed environmental assessment in line with this EARF, national and state laws and ADB SPS 2009; and (iv) consult with, and obtain official written permission from the concerned Archaeology Survey of India (ASI) and/or other relevant government agencies / religious establishment trust, if any. Such permission shall be obtained prior to finalization of the subproject detailed engineering design. Additionally, the TNSCB PMU (Environment Team) will confirm that the overall benefits of the subproject substantially outweigh the anticipated cultural heritage loss from removal.

⁸⁹ Sustainable resource management is management of the use, development, and protection of resources in a way, or at a rate, that enables persons and communities, including Indigenous Persons, to provide for their current social, economic, and cultural well-being while also sustaining the potential of those resources to meet the reasonably foreseeable needs of future generations.

⁹⁰<http://www.ifc.org/ehsguidelines>

2. Preparation of Environmental Assessment Reports

76. IEE Study and Report. For each category B subproject, an IEE report is required. IEE describes the studies conducted to identify the potential environmental impacts of a proposed subproject and is prepared when impacts are unlikely to be highly significant and can be mitigated relatively easily. The PIDs (Environment Cell) will prepare a draft IEE and EMP for each subproject. The PMU (Environment Team) will review and approve, then submit to ADB for approval. Outline and content of an IEE report is given in Appendix 6. The IEEs and EMPs prepared for the five selected sample subprojects can be used as model documents by the PIDs (Environment Cell) for environmental assessment of subsequent subprojects.

77. All the potential anticipated impacts in Section 3 and Appendix 3 of this EARF should be addressed as a minimum in each subproject IEE study which will be based on up-to-date quantified baseline information, quantitative assessment where relevant, and meaningful consultations as detailed below in next paragraphs. If there are unanticipated adverse environmental impacts that may result as part of the subproject activity, the IEE study will take cognizance of this and a time bound corrective action plan shall be developed and implemented⁹¹; the subproject IEE and EMP will be updated and submitted to ADB for review and approval.

78. **Establishing Baseline Conditions.** The PIDs (Environment Cell) will take guidance of a subproject specific REA and No Mitigation (Scoping) checklists (prepared by the PID (Environment Cell) at the screening and categorization phase of the environmental assessment process) and assess the current physical, environmental, ecological and socio-economic baseline conditions in the subproject's area of influence (study area). The study area will be defined considering the subproject site e.g. new development / resettlement sites including supporting services as included in subproject scope and its immediate surrounding area; demolition works for encroachments (including catchment area of water bodies and water channels / canals Right of Way, ascertaining the location of any Asbestos Containing Materials (ACM) prior to any demolition activity on all site maps and in GIS system, etc.); permanent / temporary access or approach roads, construction workers camps, temporary unloading / storage areas. Overall, these will not preclude assessment of any impacts that may be identified to occur outside of this study area.

79. **Impact Evaluation.** The PIDs (Environment Cell) will conduct impact evaluation across all stages of project implementation cycle – design and pre-construction, construction and operation in line with measures listed in Section 3 and Appendix 3. The potential positive and negative impacts due to the subproject will be described within the physical, environmental, ecological and social context and will include direct, indirect, cumulative and induced impacts as well as potential transboundary and global impacts including climate change.⁹² Evaluation, prediction and assessment of the positive and negative impacts of the subproject on the environment will be presented wherever possible in quantitative terms. Significance of a potential impact is measured in terms of its extent in time and space, the vulnerability of the affected environments, the reversibility of the impact and the probability of its occurrence.

⁹¹The plan will define necessary remedial actions, the budget for such actions, and the time frame for resolution of the concerns.

⁹²A detailed climate risk and vulnerability assessment will be undertaken during project preparation. Climate finance is estimated to cost \$38.8 million. Source September 2019 Mission / Aide Memoire.

80. As per ADB SPS, 2009 requirements an impact evaluation is required for all Associated Facilities and an EHS audit is required for all Existing Facilities since these are considered as part of the project scope. For subprojects involving facilities that already exist or are under construction, an EHS audit shall be undertaken by the PIDs (Environment Cell), as applicable which will include an on-site assessment to identify past or present concerns related to impacts on the environment. The objective of the EHS audit is to determine whether actions were in accordance with the EARF, and to identify and plan appropriate measures to address areas of concern. Where areas of concern are identified, a time bound corrective action plan will be prepared. The plan will define necessary remedial actions, the budget for such actions, and the time frame for resolution of the concerns. The EHS audit report (including corrective action plan, if any) will be made available to the public in accordance with the information disclosure requirements of the EARF.

81. Alternatives in terms of design, location and siting, technology will be analyzed, as applicable, in context of minimal environmental and social impacts, including a “no subproject” alternative.

82. **Meaningful Consultations.** The PIDs (Environment Cell) with support of the PMU (Environment Team), if required, will conduct meaningful consultations with affected stakeholderse.g., project beneficiaries, resettled households, host communities and other stakeholders during each subproject IEE study in accordance with the Stakeholder Communication Strategy and Plan. The subproject IEE study and report will reflect the findings from consultations and disclosure process with a provision for GRM. These findings will be communicated to the affected people and other stakeholders as well as reported to ADB and the relevant National and State regulatory authorities, if required, for review and approval before commencement of any subproject activities.

83. **Environmental Management Plan.** For each subproject activity, the PIDs (Environment Cell) with support of PMU (Environment Team) will develop EMP as part of the subproject IEE study and report. The subproject EMP will outline specific mitigation measures, environmental monitoring requirements and related institutional arrangements, including cost estimates / budget requirements for implementation. Where impacts and risks cannot be avoided or prevented, mitigation measures and actions will be identified so that the subproject is designed, constructed and operated in compliance with the GOI applicable laws and regulations and meets the requirements specified in ADB SPS 2009 and this EARF. The level of detail and complexity of the subproject EMP and the priority of the identified measures and actions shall be commensurate with the subproject’s impacts and risks. Key considerations include mitigation of potential adverse impacts to the level of “no significant harm to third parties,” the “polluter pays” principle, the precautionary approach, and adaptive management.

84. If some residual impacts are likely to remain significant after mitigation, the subproject EMP will also include appropriate compensatory measures (offset) that aim to ensure that the subproject does not cause significant net degradation to the environment. Such measures may relate, for instance, to conservation of habitat and biodiversity, preservation of ambient conditions, and GHG emissions.⁹³

⁹³Monetary compensation in lieu of offset is acceptable in exceptional circumstances, provided that the compensation is used to provide environmental benefits of the same nature and is commensurate with the subproject’s residual impact. If such a case arises in the future, this will be subject to further discussion between ADB and TNSCB.

85. The draft subproject IEE report and EMP will be submitted to ADB for review and approval.

86. National Regulatory Requirements. In case a subproject requires environmental clearance and EIA study as per the GOI EIA Notification 2006,⁹⁴ the environmental assessment documents prepared shall, to the extent possible, meet both EARF and GOI requirements in order to streamline the environmental procedures.⁹⁵ It is to be noted that for the purpose of environmental clearance, the MOEFCC stipulates conduct of EIA study only by NABET / NABL, an accredited EIA consultancy firm / organization as per the GOI norms. The PIDs (Environment Cell) with support of the PMU (Environment Team) will ensure that an environmental clearance, if required, must be obtained before submission of the final subproject IEE and EMP to ADB for review and approval. The PIDs (Environment Cell) will also ensure that all necessary permits and environmental clearances from the relevant National and State authorities will be obtained prior to the commencement of any award of contract / subproject activities.

87. Preparation of Subproject Detailed Design. Detailed design for each subproject will follow the recommendations of the subproject IEE study and EMP.⁹⁶ The PIDs (Environment Cell) with support of PMU (Environment Team) when preparing subproject detailed design will be required to review and update the draft subproject IEE study and EMP. Based on this, the final subproject IEE and EMP will be prepared and provided to ADB for review and concurrence. If there is any change in subproject design, location, alignment, layout then the relevant IEE and EMP will also need to be updated and resubmitted to ADB. In addition to this when detailed design information for associated facilities (such as but not limited to water or electricity) an EMP will need to be prepared and the relevant IEE updated and resubmitted to ADB.

88. Preparation of Bids and Award of Contracts. All final subproject IEEs and EMPs shall be approved by the PMU (Environment Team) and ADB prior to invitation of the bids for contracts. The subproject EMP will reflect the ADB approved subproject detailed design and will be included as a separate annexure in all bidding, tender and contract documents. This includes for contractors for associated facilities. The contractors will be informed of their obligations to implement the subproject EMP and to include associated implementation costs in their bids for subproject works. Non-compliance with, or any deviation from, the conditions set out in the EMP will constitute a non-compliance and shall require corrective actions.

3. Public Consultation, Information Disclosure and Grievance Redress

89. The PIDs (Environment Cell) and PIDs (Social Development and Resettlement Cell) will conduct public consultations and information disclosure as a mandatory part of the environmental assessment process for each subproject. A GRM to receive, evaluate, and facilitate the resolution of affected person's concerns, complaints, and grievances about the

⁹⁴ At present, the sample subprojects proposed under the sector loan (proposed output 1) are new building construction. The building and construction projects fall under the ambit of the GOI EIA Notification, 2006 as Category B and have been listed under Sl. No.8 (a) of Schedule of EIA Notification 2006 or built-up area greater than or equal to 20,000 square-m. The built-up area for the selected sample subprojects is greater than or equal to 20,000 square-m and less than 150,000 square-m; hence, environmental clearance from the SEIAA is required.

⁹⁵ It is recommended that the IEE and GOI EIA for a subproject is prepared concurrently to avoid any inconsistencies and ensure robust environmental assessment is undertaken.

⁹⁶ For subprojects under output 1, the detailed design will include the layout / floor plan that will be cleared by the TNSCB. Recommendations from the draft IEE study can further be integrated into the detailed design as necessary.

environmental (and social) performance at subproject level will be established early in the project cycle and detailed out in the IEE study and report. The process of public consultation and information disclosure, which is to be carried through the project preparation and implementation and GRM is presented in Section 5 of this EARF.

4. Review and Approval of Environmental Assessment Reports

90. The subproject IEEs and EMPs, prepared/updated by the PIDs (Environment Cell) will be reviewed and approved by the PMU (Environment Team) and ADB. Approval of safeguard documents of respective subproject is pre-requisite to initiate the bidding process.

91. The PMU with support of the EA is primarily responsible for identifying, prioritizing, formulating, appraising, approving, and implementing subprojects in accordance with technical, financial, and economic appraisal criteria, including environmental and social criteria, mutually agreed upon between ADB, EA and the PMU. The PMU (Environment Team) will submit all subproject IEEs and EMPs to ADB for review and disclosure. ADB will review and approve draft and final IEEs and EMPs of all subprojects. The finalized IEEs and EMPs will be disclosed to the public as per ADB SPS 2009 and included in the project administration manual (PAM).

D. Monitoring and Reporting

92. Monitoring and reporting on overall EARF compliance, exclusion criteria and subproject selection guidelines, IEE studies of subsequent subprojects and implementation of subproject EMPs are the key tasks in safeguards implementation in output 1. Contractors will implement subproject EMP and submit monthly implementation reports to PIDs (Environment Cell). The PIDs (Environment Cell) will ensure the EMP implementation at each subproject level and submit quarterly reports to the PMU (Environment Team). The PIDs (Environment Cell) will ensure EARF compliance in subproject implementation. The PMU (Environment Team) will monitor overall compliance with ADB SPS 2009 and submit monitoring reports to ADB – quarterly during pre-construction/ construction stage and annually during operation stage up to the end of the sector loan. Monitoring reports are required for all the subprojects, and therefore a consolidated monitoring report, which contain the monitoring reports of all the subprojects with requisite level of detail, can be submitted to ADB. Monitoring and reporting requirements are detailed in Section 6 of this EARF.

V. PUBLIC CONSULTATIONS, INFORMATION DISCLOSURE, AND GRIEVANCE REDRESS MECHANISM

A. Consultation and Participation

93. The PIDs (Environment Cell) and PIDs (Social Development and Resettlement Cell) with support of PMU, if required, will carry out meaningful consultations with affected persons (project beneficiaries / resettled households), host communities and other concerned stakeholders⁹⁷ and

⁹⁷ Stakeholders like the concerned district collector, commissioner of the corporation / municipality and revenue officials are also considered to be the primary stakeholders. Other stakeholders in the project will include ward level members, local councilors, resident welfare associations (RWAs), local community groups, women's groups and people within the project area of influence.

facilitate their informed participation. Consultation process undertaken under the directions of the PIDs will be in accordance with subproject specific consultation plans and:

- (i) Will begin in the subproject preparation stage and will be carried out on an on-going basis throughout the subproject cycle
- (ii) Will provide timely disclosure of relevant information that is understandable (in English and local language) and readily accessible
- (iii) Is undertaken in an atmosphere free of intimidation or coercion
- (iv) Will be gender inclusive and responsive and tailored to the needs of disadvantaged and/or vulnerable groups
- (v) Shall enable the incorporation of all relevant views of affected people, and other stakeholders into decision making, such as subproject design, mitigation measures, the sharing of development benefits and opportunities and implementation issues. Consultation will be carried out in a manner commensurate with anticipated impacts on affected people and other concerned stakeholders. The consultation process and its results will be documented and reflected in safeguards plans and documents.

94. The methodology followed for public consultations will include: (i) informing all the likely affected persons, ward committee members, local NGOs, Resident Welfare Associations (RWA) and/or Community Based Organizations (CBOs) of upcoming meetings; (ii) conducting the meetings; and (iii) documenting the minutes of the meetings, recording the list of participants by signature and photographs taken at the time of the consultations. The PIDs (Environment Cell) responses will be documented. An additional thirty (30) days commenting period will be provided to ensure capturing of all stakeholder concerns. All documented outputs from consultations will be attached as annexures to the subproject IEE reports. These identified issues and concerns will be considered by the PIDs (Environment Cell) and PMU (Environment / Social Team) for further assessment and integrated into safeguards plans and documents as necessary.

95. The socio-economic impact and census surveys will take cognizance of any disadvantaged and/or vulnerable groups, including women in the subprojects area of influence on which the potential adverse impacts could fall disproportionately. Such groups may be invited for focus group discussions (FGDs) in addition to public consultations.

B. Information Disclosure

96. The PMU (Environment Team) will submit to ADB the following documents for disclosure on ADB's public website:

- (i) Draft IEE studies and reports and EMPs, and EARF before project appraisal.
- (ii) Final IEE studies and reports and EMPs.
- (iii) New or updated IEE studies and reports and EMPs, and corrective action plan prepared during subproject implementation, if any.
- (iv) Environmental monitoring reports.

97. In accordance with ADB Public Communications Policy 2011, the PIDs (Environment Cell) with support of the PMU (Environment Team) will provide relevant subproject information including information from the above documents, in a timely manner, in an accessible place and in a form and local language (Tamil) understandable to affected persons, and other stakeholders at various stages including the project implementation period. A mechanism for the receiving,

documenting and addressing comments / complaints/ grievances will be explained and the level of compensation offered by the TNSCB PMU will be defined.

98. Information disclosure related to the subprojects shall be made on the TNSCB and ADB public websites and by using other communication and dissemination platforms such as – Project Information Brochures / Booklets (PIB),⁹⁸ notice boards in the subproject area of influence (district and village level), and on-site consultations as well as at the PID offices, district collector's office and local level offices. For illiterate persons, other suitable communication methods will be used such as direct interactive discussions. For the benefit of the community in general and affected persons in particular, for each subproject a project data sheet / information disclosure will be prepared in the local language (Tamil) with detailed mechanism for each person to register as an interested or affected party (via telephone, post, internet or in person) and provide inputs or voice concerns on subproject environmental (and social) safeguards performance. A template for project data sheet / information disclosure is provided in Appendix 7.

C. Grievance Redress Mechanism

99. The PMU will ensure that (a) local level project safeguards GRM acceptable to ADB is established in accordance with provisions and within timeframes specified in the EMP and RP to consider safeguards related complaints; and (b) a task force is functioning effectively to:

- (i) Review and document eligible complaints of project stakeholders;
- (ii) Proactively address grievances;
- (iii) Provide the complainants with notice of the decisions made;
- (iv) Prepare periodic reports to summarize:
 - (a) the number and types of complaints received and resolved at all levels;
 - (b) chosen actions and time required for resolution; and
 - (c) final outcomes of the grievances; and
 - (d) Make the reports available to ADB as part of the regular Safeguards Monitoring Reports.
- (v) Eligible complaints will include
 - (a) those related to the project activities,
 - (b) any of the service providers,
 - (c) any person responsible for carrying out the project,
 - (d) complaints on misuse of funds and other irregularities, and
 - (e) grievances due to any safeguards, labor and gender issues.

100. The PIDs (Environment / Social Cell) will establish a common GRM acceptable to ADB at divisional levels for addressing any environment and/or social issues that arise due to subproject activity. The GRM will constitute a suitable systematic process to receive, evaluate and facilitate resolution of affected persons and other stakeholder's complaints and grievances about subproject environmental (and social) safeguards performance. It will aim to provide a time-bound, trusted and transparent mechanism to voice and resolve issues and concerns associated with the subproject implementation.

⁹⁸ The PIB may contain but not limited to the following: a) the purpose and nature of the subproject and associated construction / demolition activities; b) the start date and duration of construction activities; c) potential adverse environmental impacts and mitigation, monitoring measures and resettlement measures and entitlements as per social safeguard documents; d) information on who to contact if there are concerns and complaints related to contractors, workers or the construction activities in itself.

101. Public awareness campaigns in the project area of influence will ensure that knowledge of the grievance redress procedures is generated. The PIDs (Environment / Social Cell) will conduct awareness campaigns to ensure that all affected persons and vulnerable households are made aware of grievance redress procedures, entitlements and anticipated environmental impacts.

102. Affected persons will have the flexibility of conveying grievances/suggestions by dropping grievance redress/suggestion forms in complaints/ suggestion boxes to be installed by the PIDs (Environment / Social Cell) or by writing in a complaint register in the PID office or by e-mail, or by registering complaints as per the PMU's existing grievance redress mechanism. Careful documentation of the name of the complainant, date of receipt of the complaint, address/ contact details of the person, location of the problem area, and how the problem was resolved will be undertaken. The PID (Environment / Social Cell) officers will have the overall responsibility for timely grievance redress on environmental and social safeguards issues and for registration of grievances, related disclosure, and communication with the aggrieved party. The proposed template of a grievance registration form is provided in Appendix 8. All the documents made available to the public will include information on the contact number, address and contact person for registering grievances, and will be disseminated throughout the project area of influence by the PIDs (Environment / Social Cell).

103. **Proposed GRM.**⁹⁹ In case of grievances that are immediate and urgent in the perception of the complainant, the on-site Contractor/Animator/Community Officer / Assistant Engineer / Junior Engineer from PID (Environment / Social Cell) will provide the most easily, accessible or the first level of contact for the quick resolution of grievances. Contact phone numbers and names of the concerned staff and contractors, will be posted at all construction sites in visible locations.

- (i) **1st level grievance:** The on-site contractor/ Animator/ Community Officer/ Assistant or Junior Engineer of the PID (Environment / Social Cell) will receive and record the complaint at the subproject site. Alternatively, the complaint can be registered by phone call, message, email, and this will be reverted to the onsite personnel for 1st level resolution. The complaint will be reviewed and on-site Contractor/Animator/Community Officer/Assistant Engineer/Junior Engineer of the PID (Environment / Social Cell) will try to resolve the issue on-site in consultation with the aggrieved party. This will be done within 7 days of receipt of a complaint/ grievance.
- (ii) **2nd level grievance:** All grievances that cannot be redressed within 7 days at the field (on-site) level will be brought to the notice of the Community Development Officer of the PID and the Environment Specialist of the Environment Cell and the Executive Engineer in the PID. The PID Community Development Officer / Environmental Specialist of the Environmental Cell / PID Executive Engineer (PID Head) will resolve the grievance within 14 days of receipt of a complaint/ grievance with support of the PIU Circle Superintending Engineer.

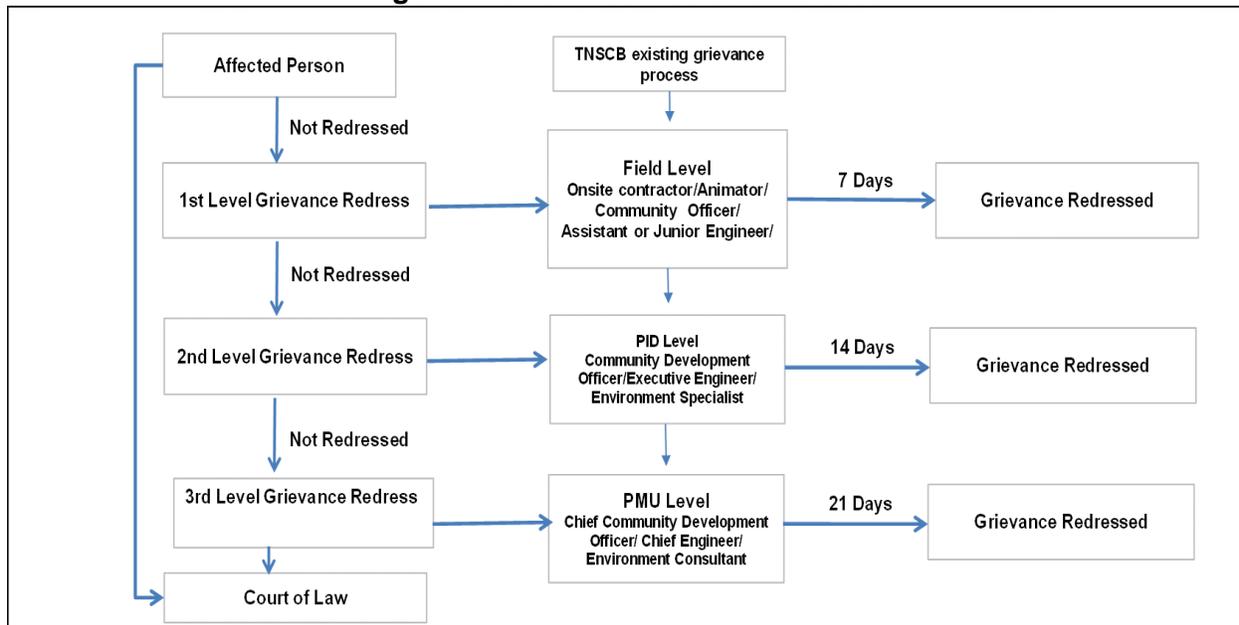
⁹⁹Any IRSHUPSP specific grievance which comes in through TNSCBs existing system (refer to Section 3) will be routed back to the project specific GRM to level 1.

- (iii) **3rd level grievance:** If the grievance is not resolved at PID Community Development Officer / Environmental Specialist/ Executive Engineer (PID Head) level, the grievance will be referred internally to Chief Community Development Officer / Environmental Consultant of PMU / the Chief Engineer of IRSHUPSP. The grievance at this level will be resolved within 21 days of its receipt.

104. The project GRM notwithstanding, an aggrieved person shall have access to the country's legal system at any stage. This can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM.

105. In the event that the established GRM is not in a position to resolve the issue, the affected persons can also use the ADB Accountability Mechanism by directly contacting (in writing) the complaint receiving officer at ADB headquarters or the ADB India Resident Mission. The complaint can be submitted in any of the official languages of ADB's Developing Member Countries. The ADB Accountability Mechanism information will be included in the project information document to be distributed to the affected communities, as part of the project GRM

Figure 4. Grievance Redress Process



106. **Record-keeping.** The PID will keep records of grievances received, including contact details of the complainant, the date the complaint was received, the nature of the grievance, agreed corrective actions and the date these were affected and the final outcome. The number of grievances recorded and resolved and the outcomes will be displayed/disclosed in the PID office, , as well as reported in monitoring reports submitted to ADB on quarterly basis. All resolutions shall be communicated to the aggrieved party / complainant(s).

107. Periodic review and documentation of lessons learned. The PMU will periodically review the functioning of the GRM and record information on the effectiveness of the mechanism, especially on the program's ability to prevent and address grievances.

108. **Costs.** All costs involved in resolving the complaints (meetings, consultations, communication and reporting/ information dissemination) will be borne by the PID.

VI. INSTITUTIONAL ARRANGEMENTS AND RESPONSIBILITIES

A. Roles and Responsibilities

109. **Executing Agency.** HUDD will be the EA responsible for overall project management and compliance with ADB loan assurances.

110. **Implementing Agencies.** TNSCB, TNIFMC, and DTCP will be the implementing agencies for output 1, 2 and 3, respectively.

111. TNSCB will be responsible for the management, coordination and execution of all subproject activities funded under IRSHUPSP, including output 1. The Government of Tamil Nadu has approved the formation of the Project Management Unit (PMU) for the project vide G.O.(2D) No.27, H&UD(SC2(2)) Department, dated: 12.02.2019. The PMU will be headed by the Joint Managing Director/ Project Director,IRSHUPSP and be supported by technical, financial, safeguards and administrative staff. The PMU is expected to have 33 staff and 11 are already in place. The project implementation arrangements are provided in Table 6.1 and graphic depicting reporting lines are provided in Figure 4.

112. **Implementing Units.** TNSCB PIDs for output 1 are established in Madurai, Salem and Villupuram.The PID (and PMU) staff will mostly be drawn from TNSCB, and if required, will also be seconded from the other government departments on deputation or hired as independent consultants; the latter will be engaged as PMU andPID staff for required expertise not available within government(refer to Appendix11.1 for Terms of Reference or TOR for an Environmental Consultant/ Specialist).The Project will also appoint an independent Asbestos / hazardous waste management consultant for ascertaining the location of any Asbestos Containing Materials (ACM) prior to any demolition activity on all site maps and in GIS system, etc., and for hazardous waste management(refer to Appendix 11.2 for TOR for an Asbestos Expert).

113. Project Implementation Units (PIUs) will be established in each of the remaining IAs, one in TNFIMC and one in DTCP. Qualified staff will be assigned to the respective PIUs to ensure compliance with ADB SPS 2009 requirements including, procurement, financial management, etc.; details and staff composition will be addressed separately in the TNIFMC / TNSF Inception Report current under preparation by KPMG for output 2 and TOR prepared for the required expertise under output 3.

Table 6.1. Project Implementation Arrangements

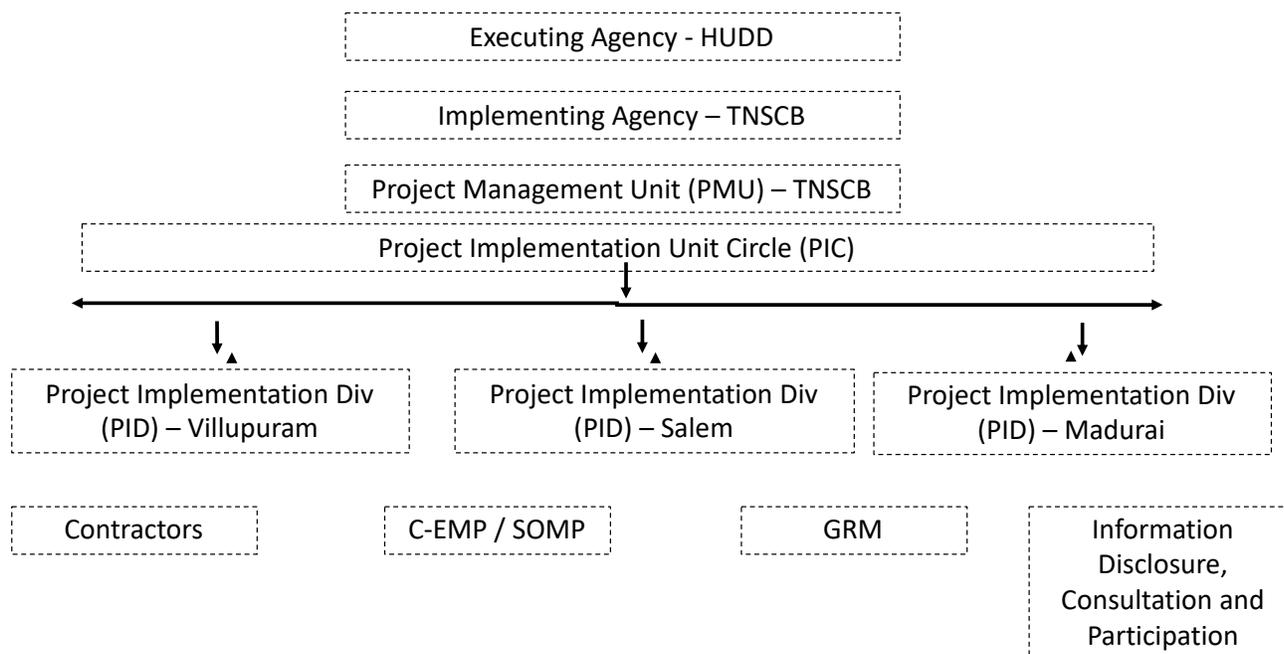
Aspects	Arrangements
Implementation period	May 2021 – April 2028
Estimated completion date	30April 2028
Estimated loan closing date	31 October 2028
Management	
(i) Oversight body	Steering Committee
(ii) Executing agency	Government of Tamil Nadu through the Housing and Urban Development Department
	Output 1
(iii) Key implementing agency	TNSCB
(iv) Implementation unit	PMU/ PIC ¹⁰⁰ andthree PIDs
Procurement	NCB (Works) 20 contracts

¹⁰⁰ PIC = Project Implementation Unit Circle.

Aspects	Arrangements	
Consulting services	QCBS (80:20)	2 contracts

ADB = Asian Development Bank, NCB = national competitive bidding, PMU = project management unit

Figure 5. Project Implementation Arrangements – Reporting Structure



114. **Project Management Unit.** The PMU will be headed by Joint Managing Director/ Project Director and will be assisted by the Chief Engineer, the Superintending Engineer and the Executive Engineer. The PIC supported by the PMU will design the infrastructure, manage the tendering of contracts, supervise the construction / demolition process, assure the technical quality of design and construction, provide advice/ assistance on institutional capacity development and ensure subproject compliance to ADB 2009, EARF, RF and loan covenants. The PIC shall appoint the contractors to build the infrastructure elements and will manage the construction and commissioning activities. The PMU will seek Government clearance for submission and disclosure of the environmental, social and resettlement monitoring reports to ADB. The PMU composition is provided in Table 6.2.

115. To ensure effective implementation of environmental safeguards procedures, one (1) environmental consultant will be hired as an independent consultant and assigned to the Environment Team of the PMU. The environmental consultant will be supported by one (1) Assistant Executive Engineer and two (2) Assistant Engineers who will be full-time employees of the TNSCB.

116. The PMU (Environment Team) will be responsible for the following environmental safeguard activities:

- (i) Ensuresubproject compliance to GOI, GoTN statutory and legal environmental requirements, ADB SPS 2009, the project EARF, and loan covenants
- (ii) Ensure subprojects conforms to exclusion criteria and subproject selection guidelines as stipulated in the EARF
- (iii) Review and approve subproject category for environment
- (iv) Review and approve subproject IEE studies and reports and EMPs; ensure that updated subproject IEEs and EMPs reflect final subproject detailed design and submit to ADB for approval
- (v) Check whether all relevant permits / environmental clearances /approvals as per GOI and GoTN are obtained in a timely manner
- (vi) Ensure that full IEE studies and EMPs are included in bidding documents, contract clauses and civil works
- (vii) Ensure an efficient subproject implementation in line with IEE studies and reports and EMPs with adequate budget
- (viii) Review and approve subproject quarterly environmental monitoring reports submitted by PIDs (Environment Cell) and submit to ADB
- (ix) Support the preparation of quarterly and annual monitoring reports and submit to ADB
- (x) Ensure effective GRM set up and monitor grievances redress process and ensure timely redress
- (xi) Ensure adequate awareness campaigns, information disclosure is held within affected communities/ host communities to minimize resistance and ensure hassle free transition for the project beneficiaries to new resettlement sites.
- (xii) Periodical review of safeguards related loan covenants, and the compliance in project implementation
- (xiii) Organize periodic capacity building and training programs for subproject staff in safeguards
- (xiv) Ensure that subproject activities are synchronized between the RPs and EMP implementation
- (xv) Ensure that any damage to areas and infrastructure outside the agreed work sites (Corridor of Impact assessed in RP) will be restored to pre-construction conditions and will be subject to compensation at contractor cost and through written agreement with the land owner, as applicable
- (xvi) Ensure availability of budget for safeguards activities
- (xvii) Ensure disclosure of EARF, IEEs and EMPs, and monitoring documents
- (xviii) Ensure that IEE studies and GOI EIA studies for a subproject is prepared concurrently to avoid any inconsistencies and ensure robust environmental assessment is undertaken.

Table 6.2. Project Management Unit – TNSCB

S.No.	PMU Team / Composition	Supported by	No.
1	Project Director	Chief Engineer	1
		Superintending Engineer	1
		Executive Engineer	1
2	Procurement	Procurement consultant	1
		Assistant Executive Engineer	1
		Assistant Engineer	3
		Draughtsman Grade- III	1
3	Project Planning	Project Planning Officer and Urban Management Specialist	1
		Assistant Executive Engineer	1
		Assistant Engineer	3
		MIS Specialist	1
		Town Planning Specialist	1
		Planning Assistant	2
4	Environment	Environmental Consultant (independent hire)	1
		Assistant Executive Engineer	1
		Assistant Engineer	2
5	Social Impact Assessment	Chief Community Development Officer	1
		Community Development Officer	1
		Social Development Specialist	1
6	Finance	Financial Advisor and CAO / JD	1
		Accounts officer	1
		Accounts Assistant	1

117. **Project Implementation Unit Circle and Project Implementation Division.** The PMU will be supported by the Project Implementation Unit Circle (PIC) and a total of three (3) PIDS, established at Madurai, Salem and Villupuram for implementation of IRSHUPSP. The Superintending Engineering of the PIC will be incharge of all PIDs in the Circle. Each of the PIDs will be headed by an Executive Engineer. The PIC and PIDs will be responsible for the implementation, management and monitoring of the subprojects and supervision of contractors and all day-to-day activities in the field. The PID composition is provided in Table 6.3.

118. To ensure effective implementation of environmental safeguards procedures, three (3) environmental specialists will be hired as independent consultants and assigned to the Environment Cell of each PID. The environmental specialist will be supported by one (1) Assistant / Junior Engineer/ Superintendent engineer that will be full time employee of the TNSCB.

119. PID (Environment Cell) will be responsible for the following environmental safeguard activities:

- (i) Identify/select subprojects in compliance with the key exclusion criteria and subproject selection guidelines stipulated in EARF
- (ii) Conduct regular site visits for overseeing compliance with safeguards
- (iii) Prepare screening checklists and submit to PMU for categorization; update checklist and category as and when required to reflect subproject changes, and report to PMU
- (iv) Work closely with design teams to include environmental considerations in subproject location, design and technical specifications.
- (v) Identify and obtain statutory environmental clearance/permissions/approvals required for subproject
- (vi) Include standards/conditions, if any, stipulated in regulatory clearances, consents in the subproject detailed design
- (vii) Conduct environmental baseline surveys
- (viii) Prepare subproject IEE studies and reports and EMPs and submit to PMU for approval
- (ix) Update subproject IEE studies and reports and EMPs to reflect any changes in subproject during detail design / implementation; IEE shall reflect the final subproject design; IEE shall also be updated in case of any unanticipated impacts
- (x) Conduct adequate awareness campaigns are held with affected persons and within the host communities to minimize resistance and ensure hassle free transition for the affected persons / resettled households to new locations
- (xi) Conduct meaningful consultation in compliance with the EARF; disclose relevant information on safeguards to stakeholders, affected people etc. reflect inputs from public consultation in subproject IEE studies and reports and EMPs
- (xii) Integrate EMP into the bid and contract documents
- (xiii) Review and approval of contractor's site specific EMP (e.g., C-EMP / D-EMP/ R-EMP), individual sub-plans and SOMPs/ O&M-EMP as indicated in Appendix 3
- (xiv) Ensure implementation of C-EMP/ D-EMP / R-EMP, individual sub-plans and SOMPs / O&M-EMP as indicated in Appendix 3 by contractors
- (xv) Establish GRM at divisional level; coordinate grievance redress process, registration, records, information dissemination, etc., and ensure timely actions by all parties; report to PMU
- (xvi) Conduct training and capacity building activities (workshops, hands-on trainings, visits etc.) to contractors and field level staffs as well as participating ULBs and/or PWD in C-EMP/D-EMP /R-EMP, individual sub-plans and SOMPs/ O&M-EMP implementation
- (xvii) Undertake internal monitoring and supervision and record observations throughout the subproject implementation period
- (xviii) Review and approval of contractor's monthly report, consolidation into quarterly progress reports and submission to PMU
- (xix) Submit periodic monitoring reports¹⁰¹ to the PMU, who will then submit these to the ADB (refer to Appendix 10 for quarterly monitoring template)

¹⁰¹The monitoring report will focus on the progress of implementation of the safeguard, issues encountered, and measures adopted, follow up action required, if any, as well as with the status of compliance with the key exclusion and subprojects selection criteria and relevant loan covenants.

Table 6.3. Project Implementation Division– TNSCB

S.No.	PID Team / Composition	Supported by	No.
1	PID Head	Executive Engineer	1
2	Project Cell	Construction Management Specialist	1
		Assistant Executive Engineer	3
		Assistant Engineer	11
		Draughtsman Grade- III	1
		Surveyor	1
3	Social Development and Resettlement Cell	Community Officer/ Social and Gender Specialist	1
		Community Development Officer	3
		Animator	3
4	Environment Cell	Environmental Specialist (independent hire)	1
		Assistant / Junior Engineer / Superintendent	1
5	Finance	Divisional Accountant	1
		Assistant / Junior Assistant	1
		Superintendent	1
6	Support Staff	Assistant / Junior Assistant	1
		Office Assistant	1
		Data Entry Operator	1

120. **Contractors.** Contractors will appoint their own Contractor Environment, Health and Safety (C-EHS) and Contractor Grievance Redressal Mechanism (C-GRM) staff as well as Contractor Asbestos Containing Materials (C-ACM) staff for construction works at resettlement sites, demolition sites / removal of encroachments and regeneration works¹⁰². All contractors will be required to prepare a site-specific EMP (C-EMP/ D-EMP / R-EMP), individual sub-plans and Standard Operation & Maintenance Plans (SOMP) / O&M-EMP (refer to Appendix 3 of EARF). The contractors will bear the costs of preparing these site-specific plans as included in the EMP (refer to Appendix 3). These will help to avoid unplanned activities of contractors and will guide the smooth implementation of all subproject activities. The list of plans are provided in Table 6.4, these are indicative and will be re-assessed in detail during preparation of subproject specific EMPs. The contracts will not be awarded until the SEIAA has approved all environmental clearances, other relevant permits and clearances have been obtained, ADB has approved the subproject IEEs and EMPs and corresponding subproject EMPs are included in the bid and contract documents. The following are the key safeguards tasks for contractors

- (i) Submit site specific EMP for construction, demolition and regeneration works, individual sub-plans and SOMPs / O&M-EMP to PID
- (ii) Attend training and capacity building sessions
- (iii) Conduct orientation and daily briefing sessions to workers on EHS

¹⁰²C-ACM staff appointment will be for demolition / removal of encroachment works only.

- (iv) Ensure that appropriate worker facilities (workers accommodation / camps) are provided at the work sites in line with the EARF
- (v) Register and maintain records of all work-related accidents, and undertake remedial actions to mitigate/minimize recurrence
- (vi) Implement EMP measures and report to PIDs if any new impacts are surfaced; seek guidance from PID as required in EMP implementation
- (vii) Conduct environmental monitoring (air, noise, etc.) as per the monitoring plan
- (viii) Prepare monthly EMP monitoring reports and submit to PID
- (ix) Address any grievances effectively and in timely manner

121. The PMU and PIDs will ensure that the contractors are aware of their obligations including specific provisions requiring contractors to comply with: (i) all applicable labour laws and core labour standards on (a) prohibition of child labour as defined in national legislation for construction and maintenance activities; construction site should not hire any child below 18 years of age; (b) equal pay for equal work of equal value regardless of gender, ethnicity, or caste including no discrimination against pregnant women and (c) prohibition of forced labour; and with (ii) the requirement to disseminate information on health & safety risks due to transmittable diseases, including HIV/AIDS and COVID-19,¹⁰³ to employees.

Table 6.4. List of Sub-Plans¹⁰⁴

Environmental Component Likely to be Affected	Sub-plans / SOMP¹⁰⁵
Land and Vegetation	<ul style="list-style-type: none"> - Spoils Re-use / Disposal Plan - Hazardous Materials Control Plan - Site Restoration Plan - Sludge Management and Disposal / Re-use Plan - New Housing Development Standard Operation & Maintenance Plan / O&M EMP - Regeneration Works Standard Operation & Maintenance Plan
Air	<ul style="list-style-type: none"> - Noise and Dust Control Plan
Water	<ul style="list-style-type: none"> - Construction Wastewater Management Plan - Spills Response Plan
Waste	<ul style="list-style-type: none"> - Materials Management Plan (including warehouse / storage) - Waste Management Plan

¹⁰³The Ministry of Health and Family Welfare, Government of India has released the Environmental and Social Management Framework for India #COVID19 Emergency Response and Health Systems Preparedness Project; particularly Annex IV: India COVID-19 Project – Clauses for Inclusion in Civil Works Contracts; The document can be accessed here: <https://www.mohfw.gov.in/pdf/EnvironmentalandSocialManagementFrameworkforIndiaCOVID19EmergencyResponseandHealthSystemsPreparednessProjectP173836.pdf> The Ministry of Law and Justice, Government of India has released the Occupational Safety, Health, Working Conditions Code, No. 37, 28th September 2020; the document can be accessed here: http://dgms.gov.in/writereaddata/UploadFile/Occupational_Safety_Health_Code_Act_2020_as_assented_by_the_President_of_India637370849494550871.pdf

¹⁰⁴ The sub-plans will be developed by the contractor(s) based on the project EMP for individual subprojects and activities (e.g. construction, demolition, regeneration) that reflects their approach, methodology and work method statements considering the findings of the subproject IEEs.

¹⁰⁵ The SOMP shall be prepared by the O&M contractor(s) during operation & maintenance stage, sub-plans prepared by Civil works contractors may be carried forward and implemented as deemed appropriate during the operation & maintenance stage e.g. Noise and Dust Control Plan, Materials Management Plan, etc.

Environmental Component Likely to be Affected	Sub-plans / SOMP ¹⁰⁵
Humans (Communities / Workers)	<ul style="list-style-type: none"> - Community Health and Safety Plan - Occupational Environment, Health and Safety Plan (including worker's facilities and work areas) - Emergency Response Plan (ERP) - Traffic Control Plan - Health & Safety Risks due to Transmittable diseases (HIV/AIDS and Covid-19) / awareness plan
Physical Cultural Resources	<ul style="list-style-type: none"> - Chance Find Procedures - Heritage Impact Assessment and Management Plan

122. ADB will (i) review the EARF and its subsequent updates as necessary; (ii) review selected sample subproject IEE prior to ADB Board consideration; (iii) review REA checklists and No Mitigation Scenario (Scoping) checklists for subprojects prepared by the PMU (Environment Team) and provide guidance as required; (iv) periodically review subsequent subproject IEEs prior to ADB Board consideration; (v) review subproject monitoring reports; and (vi) officially disclose safeguards documents on its web site in accordance with ADB SPS 2009. The extent of ADB's supervision activities will be commensurate with the subproject risks and impacts and will be performed on an ongoing basis until a project completion report is issued. ADB will also help the TNSCB PMU in building capacity in the relevant fields such as safeguards implementation, compliance assurance, monitoring and reporting throughout the project cycle.

123. If the TNSCB PMU fails to comply with the loan and legal agreements on safeguards requirements, ADB will seek corrective measures and work with the TNSCB PMU to achieve compliance. If the TNSCB PMU fails to re-establish compliance, then ADB may exercise remedies, including suspension, cancellation or acceleration of maturity that are available under ADB legal agreements. Before resorting to such measures, ADB will use other available means to rectify the situation satisfactory to all parties to the legal agreements, including initiating dialogue with the parties concerned to achieve compliance with legal agreements. Further details on institutional roles and responsibilities for safeguards implementation are presented in Table 6.5.

124. **Government Agencies.** The GOI MOEFCC has a mandate to formulate and implement policies on conservation and management of ecosystems and natural resources, pollution control and climate change, implement environment regulation and approve environmental clearances. State agencies have a mandate to review and approve environment permits / clearances for projects such as the SPCB of Tamil Nadu and SEIAA. The concerned agency will specify the type of safeguards documentation required, review and approve applications e.g., for CTE, CTO, TOR of the EIA as applicable. The concerned agency will supervise compliance assurance with safeguards plans and documents, permit approvals, which could be done through: (i) active monitoring by taking initiative to monitor or (ii) passive monitoring by receiving monitoring reports from the TNSCB PMU.

Table 6.5. Institutional Roles and Responsibilities for Safeguards Implementation

Project Stage	Tasks	Responsible Agency	
		Implementation	Supervision
Subproject	<ul style="list-style-type: none"> • Ensuring that the key exclusion criteria 	PIDs (Environment	PMU

Project Stage	Tasks	Responsible Agency	
		Implementation	Supervision
identification and finalization	<p>and environmental guidelines for subproject selection are adhered to</p> <ul style="list-style-type: none"> • Prepare REA and No Mitigation (Scoping) checklists • Categorize the subproject 	Cell)	(Environment Team)
Preliminary design	<ul style="list-style-type: none"> • Identify GOI and GoTN regulatory requirements (clearances/approvals/consents etc.) • Check latest amendments to EIA • Notification 2006 for environmental clearance requirement and subproject categorization (B1 / B2) • Preparation of subproject IEE studies and reports and EMPs 	PIDs (Environment Cell)	PMU (Environment Team)
	<ul style="list-style-type: none"> • Delineating and mapping of catchment areas of encroached water bodies and/or areas vulnerable to flooding hazards and mapping • Delineating and mapping ROW for water canals / channels 	PID (Environment Cell)	PMU (Environment Team)
	<p>Conduct survey and develop database for information management for:</p> <ul style="list-style-type: none"> • Number of project beneficiaries • full demographic and socio-economic profiles of project beneficiaries • complete inventory of livelihood and asset losses due to physical and economic displacement of the project beneficiary • information on environmental impacts of the subproject at the beneficiary-level 	PID / PMU with support of other public / state agencies	PMU
	<ul style="list-style-type: none"> • Mitigation measures specified in subproject IEE studies and reports incorporated in subproject detailed design • Updating of subproject IEE studies and reports to integrate any changes in subproject after approval of studies and reports 	PIDs (Environment Cell)	PMU (Environment Team)
Detailed design	<ul style="list-style-type: none"> • Conducting capacity development activities for staff, hired workers, contractors 	PIDs (Environment Cell)	PMU (Environment Team)
	<ul style="list-style-type: none"> • For subprojects involving facilities and/or business activities that already exist or are under construction, undertake an environment and/or social compliance audit, including on-site assessment, to identify past or present concerns related to impacts on the environment. Where non-compliance is identified, a Corrective Action Plan shall be prepared, and agreed on by ADB and the TNSCB PMU 	PIDs (Environment Cell)	PMU (Environment Team)

Project Stage	Tasks	Responsible Agency	
		Implementation	Supervision
	(Environment Team) and implemented, accordingly.		
	<ul style="list-style-type: none"> Obtain all necessary environmental clearances, consents, and no objection certificates (NOCs) as per the national and state legal framework prior to bid invitation and/or award of contract¹⁰⁶ 	PIDs (Environment Cell)	PMU (Environment Team)
	<ul style="list-style-type: none"> Meaningful consultations carried out in a manner commensurate with the impacts on affected stakeholders. The consultation process and its results to be documented and reflected in the subproject IEE reports. 	PIDs (Environment Cell / Social Cell) /	PMU (Environment Team / Social Impact Assessment Team)
	<p>Information Disclosure: For Category B</p> <ul style="list-style-type: none"> Disclosure on the TNSCB website of the draft subproject IEEs and EMPs; updated IEEs and EMPs including corrective action plans; environmental monitoring reports. Disclosure of draft IEE (and EMP) in a timely manner, in an accessible place and in a form and language understandable to affected people and other stakeholders. Any revised IEE (and EMP) should be disclosed to affected people and other stakeholders. 	PIDs (Environment Cell) PMU (Environment Team)	PMU (Environment Team)
	<ul style="list-style-type: none"> Disclosure on ADB website of the final subproject IEE studies and reports and EMPs; updated subproject IEE studies and reports and EMPs and corrective action plans; environmental monitoring reports. 	ADB	ADB
	<ul style="list-style-type: none"> Incorporate final subproject EMP into bid/contract documents 	PIDs (Environment Cell)	PMU (Environment Team)
Appraisal	<ul style="list-style-type: none"> EMP and other environmental covenants are incorporated into the sector loan agreement and project administration memorandum (PAM) Approval of subproject IEE studies and reports and EMPs prior to invitation of bids All clearances are in place prior to invitation of bid / award of contracts / start of work 	PIDs (Environment Cell)	PMU (Environment Team)
	<ul style="list-style-type: none"> Effective GRM established prior to award of contracts 	PIDs (Environment Cell)	PMU (Environment Team)

¹⁰⁶ TNSCB will take into cognizance that it is a best practice to obtain all necessary environmental clearances, consents, etc., prior to bid invitation; however, these must be clearly obtained prior to award of contract.

Project Stage	Tasks	Responsible Agency	
		Implementation	Supervision Team)
Approval	ADB will be responsible for regular review and timely approval of subproject IEE studies and reports and EMPs (draft and final)	ADB	-
Bid Invitation and Award of Contracts	<ul style="list-style-type: none"> Approval of subproject IEE studies and reports and EMPs a must prior to bid invitations Subproject EMPs to be incorporated into contracts. Ensure all statutory national and state clearances prior to award of contracts 	PIDs (Environment Cell)	PMU
Subproject Implementation	<ul style="list-style-type: none"> Development and approval of site-specific Construction-EMP and Demolition-EMP by contractors and individual sub-plans Implementation of above EMP including monitoring and reporting plans by contractors and submission of monthly reports to PIDs (Environment Cell), Submission of Quarterly progress reports (Environment Cell) to PMU (Environment Team) including corrective action plan where a non-compliance is identified Conduct public consultation and awareness programs as per EARF Overall compliance monitoring and submission of quarterly monitoring report during construction stage and annual reporting during operation stage by PMU (Environment Team) to ADB ADB will be responsible for reviewing regular monitoring reports 	Contractors PIDs (Environment Cell) PMU (Environment Team)	PMU

B. Capacity Building

125. It is necessary that all the environment and social staff at PMU, PIDs are provided with the necessary training to deal with environment and social safeguard tasks following ADB SPS 2009 requirements and in line with EARF and RF. The safeguard staff will be trained through a series of programs periodically conducted by ADB for TNSCB on safeguards.

126. The PMU Environment Team will then conduct further training and capacity building program on environmental management for the PIDs staff and contractors / sub-contractors. Specific modules customized for the available skillset shall be devised after assessing the capabilities of the target participants and will be in accordance with both ADB and GOI requirements and included in subproject IEE studies and reports. The modules will include but not be limited to:

- (i) Sensitization on ADB's policies on environmental safeguards

- (ii) Introduction to environmental safeguards assessment and document requirements
- (iii) Review of IEEs / EMP and integration into the subproject detailed engineering design
- (iv) EMP implementation
- (v) Community and occupational health and safety considerations
- (vi) Information disclosure, consultation and participation requirements
- (vii) Project GRM and ADB's Accountability Mechanism
- (viii) Improved coordination within nodal departments and other relevant agencies
- (ix) Monitoring and reporting requirements, including corrective action planning
- (x) Construction schedules and timelines
- (xi) The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites
- (xii) Learnings and best practices sharing
 - (a) Experiences on resettlement plan implementation
 - (b) Issues and challenges
 - (c) Best practices followed

127. The preliminary capacity building program and corresponding cost estimates are provided in Table 6.6.

Table 6.6. Training and Capacity Building Program and Cost Estimates

Training	Attendees	Content	Schedule	Period (day)	Frequency	No of persons	Cost (USD /person/day)	Total Cost (USD)
EARF implementation	PMU, PIDs, PIC, Project Staff	ADB SPS (2009)	Design and pre-construction stage: once during design and pre-construction stage	1	7	10	50	3,500
		India's relevant environment, health and safety laws, regulations and policies						
		WBG EHS Guidelines						
		Environmental monitoring and reporting						
		Requirements for information disclosure, public consultation, community awareness program						
		Social safeguard requirements (RP)						
		Roles and responsibilities and Procedures						
Project GRM								
EARF implementation	Project Contractors	Same as above	Construction Stage: Once prior to start of civil works	1	3	3	50	450
	Project Contractors, Participating ULBs / Local Municipalities (demolition works)		Demolition Stage: Once prior to start of demolition works	1	1	5	50	250
Environmental Awareness, Orientation and Briefing on Safeguards	Field Staff, Workers, Sub-contractors	Same as above	Construction Stage: Once prior to mobilization on site during construction	0.5	3	50	50	3,750
			Demolition Stage: Once prior to mobilization on site for demolition works	0.5	1	50	50	1,250
	Facility Operators		Operation Stage: Once prior to start of operation	0.5	6	5	50	750
Total								9,950
Total Estimated Cost for 10 Subprjects								99,500
PMU = project management unit; PID = project implementation division; PIC = project implementatio unit circle; Contractors = EPC contractors , Demolition works contractors, regeneration works cotractors, sub-contractor(s); RP = Resettlement Plan; IFC (WBG) EHS = International Finance Corporation (World Bank Group) Environment, Health and Safety								

Frequency:
PMU, PIDs, Project Staff - once a year
Project Contractors - 3 times over 6 months period of civil works at each new settlement site
Project Contractors, Participating ULBs / PWDs - 1 time for demolition work at each encroached site
Field Staff, Workers, Sub-contractors - 3 times over 6 month period of civil works at each new settlement site
Field Staff, Workers, Sub-contractors - 1 time for demolition works at each encroached site
Facility Operators - 2 times per year for total of 3 years at each new settlement site

C. Implementation Schedule

128. The proposed output 1 will be implemented over 7 years, from May 2021 onwards. The TNSCB PMU will ensure that subproject activities are synchronized between the RP and EMP implementation activities including subproject civil works, demolition works and regeneration works. The TNSCB PMU will also ensure that no physical or economic displacement of affected persons will occur until: (i) compensation at full replacement cost has been paid to each affected person for subproject or sections of subprojects that are ready to be constructed; (ii) other entitlements listed in the RP are provided to the affected persons; and (iii) a comprehensive income and livelihood rehabilitation program (Graduation approach), supported by an adequate budget, is in place to help affected persons improve, or at least restore, their incomes and livelihoods.

D. Staffing Requirements and Cost Estimates

129. For each subproject activity, the PIDs (Environment Cell) with support of the PMU (Environment Team) will include cost estimates in the detailed subproject IEEs/ EMPs and update these prior to the tendering stage. The PMU (Environment Team) will provide cost estimates, make budgetary provisions and finalize staffing requirements for preparation, review and implementation of all IEEs studies and EMPs, including this EARF and monitoring for subsequent subprojects. Costs may be attributed to the following:

- (i) Screening and categorization, conducting IEE studies, preparing and submitting reports, which involves collection and analysis of data of proposed subproject, assessment and mitigation of impacts, preparation of the EMP, public consultation and information disclosure and preparation of the IEE reports including executive summaries
- (ii) Implementation of EMP mitigation measures by contractors, the cost of which will be included in the tenders, bids and construction contracts
- (iii) Institutional and capacity building activities related to environmental safeguards as per ADB SPS 2009 and International Best Practices
- (iv) Other mandatory measures undertaken to adhere to the environmental clearance/ permits from national regulatory agencies at the cost of PMU
- (v) Other costs that need to be added may include, but not limited to, training for HIV/AIDS prevention, Covid-19, orientation of workers and staff

130. The preliminary cost estimates for EARF implementation are provided in Table 6.7.¹⁰⁷

¹⁰⁷Since subsequent subprojects are not yet scoped out entirely, separate cost estimation is not done at this stage.

Table 6.7. (a) Preliminary Cost Estimates for EARF implementation

S.No	Item	Number	Cost per Unit (USD)	Total Cost (USD)	Sources of Fund
A Human Resources and Support for Environmental Safeguards Implementation					
1	International Asbestos Expert	3 person-months spread over entire project implementation period of total 84 months	4,000 per month	12,000	Included in the project cost i.e. loan
2	International Consultant - Travel	Assumes 6 visits, 7 days per visit (including travel time); 6 RT @2000/RT; 42 days per diem @ \$110 /day	16,620	16,620	Included in the project cost i.e. loan
3	Site Visits / Transportation Costs for International Expert	Assumes 20 site visits	lumpsum	3,000	Included in the project cost i.e. loan
4	Project Management Unit (PMU) - Environmental Consultant for environmental safeguard activities, No. persons 1	84 person months (spread over entire project implementation period of 84 months)	1133 per month	95,172	Borne by TNSCB
5	Project Implementation Divisions (PIDs) - Environmental Specialist for environmental safeguard activities; No. persons 3	84 person months (per person) spread over entire project implementation period of 84 months	933 per month	2,35,116	Included in the project cost i.e. loan
	Sub-total			3,61,908	
	Contingencies (5.0%)		5.00%	18,095	
	A. TOTAL			3,80,003	
B Administrative Costs					
6	Permits and Clearances	All subprojects	Lumpsum	20,000	Borne by Contractor (included in contractor cost estimates) except EC clearance which will be borne by the TNSCB
C Training and Capacity Building					
7	Training and Capacity building PMU, PIDs and Project Contractors, Participating ULBs / Local Municipalities				
8	Environmental Awareness, Orientation and Briefing on Safeguards for other Field Staff, Workers and Sub-contractors, Facility Operators	Refer to Tab 1 for assumptions	Refer to tab 1 for estimates and costing	99,500	Included in the project cost i.e. loan

Table 6.7. (b) Preliminary Cost Estimates for EARF implementation

S.No	Item	Number	Cost per Unit (USD)	Total Cost (USD)	Sources of Fund
D Studies and Environmental Monitoring					
9	Water Use Sustainability / Hydro-geological Study	Assumes 10 subproject sites (new settlement / development sites)	3,000 per site	30,000	Borne by TNSCB
10	Environmental monitoring to establish baseline, during construction / demolition phases and during operation phase as per subproject specific requirements	All subprojects (i.e. 10 new settlement / development sites and 10 demolition sites)	3,000 per site	60,000	Borne by Contractor (included in contractor cost estimates)
E Other Costs					
11	Public consultations and Information Disclosure	All subprojects (i.e. 10 new settlement / development sites and 10 demolition sites)	lumpsum	30,000	Borne by TNSCB
12	GRM implementation	All subprojects (i.e. 10 new settlement / development sites and 10 demolition sites)	lumpsum	30,000	Borne by TNSCB
13	Develop and Implement - individual sub-plans such as Site restoration plan, Spills reponse plan, EHS plan, ERP, Sludge Management and Disposal / Re-use Plan, Traffic Control Plan, etc	All subprojects (i.e. 10 new settlement / development sites)	lumpsum	50,000	Borne by Contractor (included in contractor cost estimates)
14	Develop and Implment New Housing Development Standard Operation and Maintenance (SOMP)	All subprojects (i.e. 10 new settlement / development sites)	lumpsum	50,000	Borne by Contractor (included in contractor cost estimates)
14	Develop and Implment Renegeration Works Standard Operation and Maintenance (SOMP)	All subprojects (i.e. previously encroached sites)	lumpsum	1,00,000	Borne by Contractor (included in contractor cost estimates)
15	Any unanticipated impact due to subproject implementation	All subprojects (i.e. 10 new settlement / development sites)	lumpsum	Refer to footnote 7	Borne by Contractor (included in contractor cost estimates)
	Contingencies (7.5%)		7.5%	4,69,500	
	B. TOTAL			35,213	
				5,04,713	
	GRAND TOTAL (A+B)			8,84,716	

NOTES:
1. Numbers may not sum up precisely because of rounding.
2. Human resources for environmental safeguards implementation at PMU and PID will be borne by the loan except for the environment consultant at PMU which will be borne directly by the TNSCB.
3. Information Disclosure, Consultation and Participation and GRM costs will be borne by TNSCB.
4. Measures that will permanently become part of the infrastructure at new housing development such as design features for adverse environmental impact mitigation, climate risks, landscaping, hedge planting, maintenance of open green space, permanent access roads to new housing development , road signage) and regeneration works such as perimeter fencing with adequate ground clearance for passage of animals, detailed engineering measures for preventing soil erosion and/or localized flooding will be included within the main civil work contract costs and not double-counted as part of the EARF costs .
5. Measures that will permanently become part of the regenerated site such as perimeter fencing, re-greening/re-vegetation of banks along water bodies and channels, clearing and preventing new waste disposal and/or sewage disposal in water bodies and channels will be included within the main regeneration works contract costs and not double counted as part of the EARF costs.
6. Measures during the construction stage and demolition stage (e.g. periodic watering for dust control, use of hand held portable air and noise monitoring devices, quiet / low noise machinery and equipment, PPE, etc.) as well as measures to mitigate unforeseen impacts due to construction and/or demolition activities will need to be included in the tender documents to ensure that all contractors budget these items in their bids. Contractors will also bear all environmental monitoring costs during the operational stage.
7. Costs borne by the contractor will be included as a specific line item in the provisional sum of the tender documents.

E. Monitoring and Reporting

131. The PIDs (Environment Cell) with support of the PMU (Environment Team) will conduct environmental monitoring for each subproject and provide the environment input based on site inspections, compliance checks and prepare the subproject Quarterly Progress Reports (QPRs) for submission to the PMU for final submission to ADB till the project completion report is issued. Monitoring will also encompass tracking progress on regeneration works undertaken by the PMU of previously encroached water bodies / channels and surrounding areas.

132. The environmental monitoring report¹⁰⁸ for submission to ADB shall be on quarterly basis during construction and on an annual basis during operation (refer to Appendix 6 for subproject quarterly environmental monitoring report template). Environmental monitoring reports will be required to be submitted to ADB within 30 days from the end of the relevant period. The environmental monitoring reports will be publicly disclosed on ADB public website. Reporting to ADB will continue until a project completion report is completed.

133. Types of subproject monitoring that may be conducted under subproject specific EMP will include:

- (i) Project readiness monitoring. To be conducted by the PIDs (Environment Cell).
- (ii) Environmental monitoring. To be conducted by PIDs (Environment Cell) and contractors across all stages of subproject implementation as described in the subproject specific EMP and assessing compliance with applicable GOI environmental quality standards and/or International standards and best practices.
- (iii) Compliance monitoring. To be conducted by the PMU / PIDs to verify EMP compliance across all stages of subproject implementation.
- (iv) Demolition works monitoring. To be conducted by the PMU (Environment Team) / PIDs (Environment Cell).
- (v) Regeneration works monitoring. To be conducted by the PMU (Environment Team) / PIDs (Environment Cell).

134. ADB will oversee subproject compliance on the basis of the quarterly and annual environmental monitoring reports provided by the PMU (Environment Team) and site visits (generally one to two times per year). For any non-compliance, ADB will make suitable recommendations for undertaking remedial measures for mid-term correction and improvement, if required. ADB's monitoring and supervision activities are carried out on an on-going basis until a Project Completion Report is completed.

135. The contractor(s) will submit monthly progress reports to the PIDs (Environment Cell) on C-EMPD-EMP / R-EMP implementation / SOMP / O&M-EMP, which will inform the quarterly safeguards monitoring reports as part of the project QPR. The contractor monthly progress reports will include compilation of daily monitoring sheets that is duly signed by C-EHS. The template for daily monitoring sheet for contractors during construction stage is provided as Appendix 9.

136. During operations of the new housing development and regeneration works, the contractors will also submit monthly progress reports to PIDs (Environment Cell) on New

¹⁰⁸The environmental reporting will cover EMP implementation, focusing on compliance and any needed corrective actions.

Housing Development SOMP and Regeneration Works for the first year of operation and quarterly progress reports thereafter. These will inform the annual safeguard monitoring reports. The contractor monthly (and quarterly) progress reports will include compilation of daily monitoring sheets corresponding to the operation of assets created; the subproject specific IEE will include a template for daily monitoring sheets during operation stage.

SUBPROJECT SELECTION TEMPLATE

Environmental Guidelines for Subproject Selection		Remarks
All Subprojects including supporting services	Complies with key exclusion criteria in Table 1.3	
	Complies with ADB SPS 2009, this EARF and the national and state legal and regulatory framework	
	The primary environmental criteria for selecting subproject sites to be relocated is vulnerability to flooding of targeted non-titled project beneficiaries without tenure security residing in encroachments (i.e., waterbodies / waterways). No new development sites in flood areas, areas with a history of flooding or areas zoned for coastal protection.	The local word for land title is 'patta'
	The selected subprojects (new development / resettlement sites) should have sufficient land for the accommodation of all project beneficiaries / resettled households and community members in line with housing space and design ratio considerations.	
	The selected subprojects (new development / resettlement sites) should be within one-hour travel time on public transport from existing encroachments such that project beneficiaries / resettled households and community members have continued access to livelihood generation activities	
	The selected subprojects (new development / resettlement sites) should be within a 2.5 km radius of public amenities or be within prescribed social infrastructure access norms.	
	The selected subprojects (new development / resettlement sites) are greenfield, therefore opportunity should be taken to ensure that these are connected to existing neighbourhoods / host communities, provide comprehensive infrastructure and supporting services, generate new optimally sited open spaces of adequate size, and community spaces.	Allocation of open space reservation (OSR) equivalent to 10 percent of total area at a resettlement site; and additional 15 percent of green belt area for projects that require Environmental Clearance (EC)
	The selected subprojects should have access to or include supporting services (within the scope of this EARF) ¹⁰⁹ at new development / resettlement sites for project beneficiaries / resettled households and community members for better environmental outcome.	Existing supporting services, if any, will undergo EHS audit in line with ADB SPS 2009 requirements for Existing Facilities, refer to Appendix 14. EHS audit template.
	If there is no access to supporting services,	Integration of supporting

¹⁰⁹ Refer to Section 1.3. Subproject Scope under Output 1 for list of supporting services.

Environmental Guidelines for Subproject Selection		Remarks
	then the subproject shall integrate supporting services in the subproject detailed engineering design for the new development / resettlement sites and for any other housing plans under consideration in the immediate vicinity of new resettlement sites.	services is included in subproject scope of works for new development / resettlement sites (refer to discussion in Section 1.3 and must comply with the environmental guidelines for subproject selection). These will be subject to environmental assessment in line with ADB SPS 2009, this EARF and relevant national legal and regulatory framework. These may be permitted provided that no impact to sensitive receptors is demonstrated or proven.
	Resettlement of project beneficiaries shall only take place after all supporting services are available and operational at new development / resettlement sites.	
	Subprojects will conform to land use classification and relevant development control regulations and municipality approved master plan. Subprojects (new development / resettlement sites) not covered by the master plan will require further due diligence for consideration for subproject selection as long as it meets the key exclusion criteria and prescribes to the environmental guidelines for subproject selection	Planned areas (for new resettlement sites) will guide future growth and efficiently provide basic services.
	Will not involve the use or installation of hazardous materials including asbestos, PCBs, lead based paint.	
All Subprojects including supporting services	No new construction of landfills will be supported under this sector loan	
	No new electricity generation / electricity high voltage transmission line and distribution substations will be supported under this sector loan	Subprojects should support the use of energy efficient lighting such as LEDs and/or rooftop solar panels. In case a dedicated substation is required for the new resettlement site; the substation should be sited outside the new resettlement perimeter at a distance of least 500 m. This new substation will be considered as an “associated facility” and will require due diligence as per ADB SPS 2009.

Environmental Guidelines for Subproject Selection		Remarks
		In the event of unavoidable circumstances, clearances from buildings of high and extra high voltage lines will be as per the Indian Electricity Rules 1956, amended up to 25 Nov 2000, para 79 and 80. ¹¹⁰
	Subprojects shall utilize water sources at sustainable levels of abstraction only (i.e., without significant reductions in the quantity or quality of the source overall), avoid polluted water sources, avoid water use conflicts by not abstracting water that is used for other purposes and ensure water quality provided complies with national drinking water standards at all times through regular monitoring.	A water source sustainability study will be undertaken for all water sources utilized by the subproject.
	Subprojects should locate sewerage treatment plants as far as possible from inhabited areas, ensure sewerage is treated to national wastewater discharge standards, ensure no discharge of wastewater occur where it could be a hazard to downstream users and include measures for the safe disposal of sewage sludge	
Demolition works for all subprojects / removal of encroachments	<p>Demolition works at encroachments will</p> <ul style="list-style-type: none"> ● exclude religious structures e.g., chapels, temples, mosques, etc.; and if cannot exclude, then replace the religious structures in consultation with the relevant stakeholders ● involve clearance and fencing ● avoid cutting of trees ● avoid disturbance to PCRs ● repair any structure that has been inadvertently damaged ● fencing around the water body perimeter or along channel banks¹¹¹ 	<p>If under unavoidable conditions, if any of the trees are required to be cut/ felled, then prior permission as per existing procedure from Forest department and ensuring appropriate compensation including compensatory plantation at 1:10 ratio as stipulated by the High Court of Madras (WP No 7811/2010 and MP No 1/2010 dated 25/06/2010 as well as any compensation as detailed in the RF; replacement species must be approved by District Forest Department.</p> <p>For any subproject activity that may affect PCRs e.g., local heritage sites / archaeological sites, places of worship, etc., all applicable ADB SPS 2009 requirements shall be</p>

¹¹⁰ Indian Electricity Rules: <http://www.mvvn.in/pdf/ier1956.pdf>

¹¹¹Fencing to ensure that re-encroachment of cleared spaces does not revert back to slums and is kept as green open space to realise ecological and public benefits from the cleared and restored waterways.

Environmental Guidelines for Subproject Selection		Remarks
		followed. In such cases, TNSCB shall (i) confirm that no alternatives to removal are available; (ii) prepare a heritage impact assessment outlining appropriate mitigation measures that complies with the comprehensive management plan of such site; (iii) conduct a detailed environmental assessment in line with this EARF, national and state laws and ADB SPS 2009; and (iv) consult with, and obtain official written permission from the concerned Archaeology Survey of India (ASI) and/or other relevant government agencies / religious establishment trust, if any. Such permission shall be obtained prior to finalization of the subproject detailed engineering design. ¹¹²
Regeneration works for all subprojects	Regeneration work ¹¹³ at cleared encroachments will include at a minimum: <ul style="list-style-type: none"> • re-greening / revegetation of banks along water bodies / channels • clearing and preventing new solid waste / sewage disposal in water bodies / channels 	

¹¹²Costs related to conducting a heritage impact assessment shall be borne by the TNSCB.

¹¹³Regeneration works of the cleared encroachments will be undertaken such that it does not revert back to slums and is kept as green open space to realize ecological and public benefits from the cleared and restored waterways.

SITE VISIT REPORT

Environmental and Social Safeguards. Site observations are for Proposed New Settlement Sites and Existing Encroachments / Slums proposed for Relocation; consultations were done at these sites when possible. Criteria for subproject selection are shown below.

1. Existing settlement / encroachments - area prone to flooding.
2. Existing settlement - status of ownership, patta
3. New settlement - distance of new settlement from their existing settlement
4. New settlement - Access to social infrastructure and supporting services such as schools, hospitals, roads, transport, water supply, sewerage, electricity connection, etc.
5. New settlement - Proximity to existing electricity substations, high voltage transmission lines and/or heavy or noisy polluting industrial activities
6. New settlement - Proximity to any sensitive natural and human receptors e.g., species or habitat of conservation value, significant number of trees of economic value (such as fruit bearing trees), water bodies (such as wetlands, backwaters, rivers, lakes or ponds), existing host communities / neighborhoods, schools and/or physical cultural resources (PCRs)

Site Visit Date: November 27 – 29, 2019

Location	Photographs	Observations
Pallipalayam (Ayyakattur village)		
Suitable as a sample subproject – The relocation sites identified by the TNSCB are vulnerable for flooding and meets the subproject selection criteria		
<p>Proposed Resettlement Site (New): Pallipalayam (Ayyakattur village)</p> <p>Date of Site visit: 27/11/2019</p> <p>Proposed components:</p>		<ul style="list-style-type: none"> • The proposed resettlement site (Ayyakattur village) does not have any sensitive natural receptors in and around the vicinity; the site is covered with wild vegetation and couple of trees. No chemicals will be employed for site clearance and trees over 3 m will be retained as part of open / green space allocation. • Periphery of the site supports a buffalo farmer, total number of buffalos 4 to 5 (a possible new tenant); further assessment will be undertaken to ascertain whether buffalo farmer resides on the proposed site or outside the periphery and how he may be impacted by proposed subproject activities. • The land belongs to TNSCB, the classification of land is Arasu Puramboku (Government land) and extent is approx. 1.62 hectares. • The site seems free from potential flood hazard • The site is in flat terrain and it does not require any slope stabilization

Location	Photographs	Observations
<ul style="list-style-type: none"> • 520 Dwelling units are proposed to be constructed • To be provided with supporting services / infrastructure (including approach road, water supply, electricity connection and SWM) 		<ul style="list-style-type: none"> • / retaining walls or any special treatment for stability, etc., • The site is approachable by 14 feet road (4.5m wide BT road) and it will have supporting services including electricity, water supply (to be provided by local municipality), sewerage, etc. • The distance between existing settlement site and proposed settlement site will be within 2.5 km via a railway underpass that is currently under construction. • A paper manufacturing industry (Seshasayee Paper and Boards Ltd) is located within 500m distance from the site and hence ambient air quality, stack wind direction, and effluent to the nearest water body will be monitored to confirm proposed site suitability. • The paper mill could be a potential source of employment opportunities for new resettled residents. • The natural drain system of the site will be studied using the contours generated from the topo-survey. • High voltage transmission lines/ crossings were not observed • The site has existing basic amenities including a nearby school, bus stop, composting shed and common toilets. • The site is close to existing settlement; therefore, minimal disturbance to existing livelihood activities is envisioned.
<p>Slum proposed for relocation (existing):: Jayanth Nagar, Meenavar Street and Periyar Nagar</p>		<ul style="list-style-type: none"> • Slum sites are situated adjacent to Cauvery River which is a perennial river and prone to flooding during the monsoon; this was further verified by stakeholder consultation; water is stored in the check dam which when released affects households in the area. • Water supply is provided by the ULB / municipality • None of the households are connected to septic tank facilities; toilet and kitchen wastewater is directly discharged into Cauvery river. • Local municipality has also provided common toilet facilities for the slum sites. • At the time of the consultation, some residents expressed their willingness to relocate while others expressed reluctance. Therefore, there is a mixed response to proposed resettlement and this will require ongoing consultations. • Patta is not available

Location	Photographs	Observations
		<ul style="list-style-type: none"> Majority of the residents are employed in small scale loom industries in the immediate vicinity and also work as daily laborers. Some residents practice fishing for livelihood and sustenance; this may be impacted if access to the river is unavailable or restricted post resettlement. The subproject design will consider the construction of a small jetty such that fisherfolks may continue their activities.
<p>Slum proposed for relocation (existing): (Kaveri Nadhi oram street, Natta Govdan Pudur)</p>		<ul style="list-style-type: none"> slum site is situated adjacent to Cauvery river and is vulnerable to flooding. Inundated houses were observed in the slum site that had been subsequently abandoned. There is a small-scale cloth dyeing industry in the vicinity of of site; further checks should be undertaken to understand the current industry effluent discharge into the Cauvery river and corresponding impact. This is important from the perspective of regeneration works of existing encroachments. Water supply is provided by the ULB / municipality None of the households are connected to septic tank facilities;toilet and kitchen wastewater is directly discharged into Cauvery river. Local municipality has also provided common toilet facilities for the slum sites. At the time of the consultation, some residents expressed their

Location	Photographs	Observations
		<p>willingness to relocate while others expressed reluctance. Therefore, there is a mixed response to proposed resettlement and this will require ongoing consultations.</p> <ul style="list-style-type: none"> • Patta is not available • Majority of the residents are employed in small scale loom industries in the immediate vicinity and also work as daily laborers. • Some residents practice fishing for livelihood and sustenance; this may be impacted if access to the river is unavailable or restricted post resettlement. The subproject design will consider the construction of a small jetty such that fisherfolks may continue their activities.
<p>Dindigul (Odukkam)</p> <p>Suitable for sample subproject –There was no visible signs of flooding at the existing settlement sites at the time of site visit, these get flooded during monsoon. The encroachments are built on water bodies including tanks, ponds etc.</p>		
<p>Proposed Settlement Site (New): Odukkam (Adiyanoothu Village)</p> <p>Date of Site visit: 28/11/2019</p>		<ul style="list-style-type: none"> • The proposed resettlement site (Adiyanoothu village) does not have any sensitive natural receptors in and around the vicinity; the site is covered with wild vegetation and couple of trees. • No chemicals will be employed for site clearance and trees over 3 m will be retained as part of open / green space allocation. • Government high school wall abuts the proposed resettlement site boundary • The land belongs to Dindigul corporation and classified as Ryotwari Dry (Government land); the proposed settlement area has an extent of 4.81 hectares • An abandoned pump house that was constructed by the British is on

Location	Photographs	Observations
<p>Proposed components:</p> <ul style="list-style-type: none"> • 1224 Dwelling units proposed • To be provided with supporting services / infrastructure (including, water supply, electricity connection. and SWM) 		<p>the proposed settlement site however, it does not seem to any archaeological importance; this will be verified further in consultation with the local ASI office.</p> <ul style="list-style-type: none"> • The nearest bus stand and railway station is at Kavery nagar at a distance of 2 km and 1 km, respectively from the proposed settlement site. • Water supply will be provided by local ULB / municipality • The proposed resettlement site is approachable by 24 feet paved road. • A temple is located close to the proposed resettlement site • The site seems free from potential flood hazard and any heavy polluting industrial activities; no high voltage transmission line was observed in the vicinity. • The site is in flat terrain and it does not require any slope stabilization/ retaining walls or any special treatment for stability, etc., • The natural drain system of the resettlement site should be studied due to the presence of two culverts within the proposed resettlement area • Small shops/ petty shops are located in walkable distance • The Medical College proposed next to the proposed resettlement site will provide the new tenants access to medical facilities and also potential opportunities for employment.
<p>Slum proposed for relocation (existing): Ayyan Kulam</p>		<ul style="list-style-type: none"> • The water body (Pond) is flooded in the monsoon season, however, the encroachers are not affected due to the provision of drains that carry both rainwater, solid waste and sewage that later discharge into the pond • The existing settlement area falls within the regulated zone of the ASI monument (Dindigul Fort); further checks will be conducted with the local ASI office to ascertain whether the encroached pond falls under its jurisdiction. ASI permission may be required for the demolishing works. • Water supply is provided by the Dindigul Corporation • At the time of the consultation, some residents expressed their willingness to relocate while others expressed reluctance. Therefore, there is a mixed response to proposed resettlement and this will require ongoing consultations. <p>Patta is not available</p>

Location	Photographs	Observations
		<ul style="list-style-type: none"> • People at the existing settlement are involved in various employment activities such as weaving, daily wage laborers, etc. •
<p>Slum proposed for relocation (existing): Kamarajapuram (Canal)</p>		<ul style="list-style-type: none"> • The water canal is flooded in the monsoon season, however, the encroachers are not affected due to the provision of drains that carry both rainwater, solid waste and sewage and the final discharge takes place in the canal • The existing settlement area falls within the regulated zone of the ASI monument (Dindigul Fort); further checks will be conducted with the local ASI office to ascertain whether the encroached pond falls under its jurisdiction. ASI permission may be required for the demolishing works. • The nearest school and hospital are located at a distance of 2.0 to 2.5km from the existing settlement • Water supply is provided by ULB / municipality; this is used for drinking purposes. • Households purchase water for domestic use; 1000 Litres /₹250

Location	Photographs	Observations
		<ul style="list-style-type: none"> • None of the households are connected to septic tank facilities; toilet and kitchen wastewater is directly discharged into the canal • • Local municipality has also provided common toilet facilities for the slum sites. • At the time of the consultation, some residents expressed their willingness to relocate while others expressed reluctance. Therefore, there is a mixed response to proposed resettlement and this will require ongoing consultations. • Patta is not available • The residents at existing settlements are involved in various livelihood activities, such as daily wage laborers, auto drivers etc.
<p>Slum proposed for relocation (existing): Govindaswamy Nagar</p>		<ul style="list-style-type: none"> • Encroachments exist on both sides of a water drain that currently carries solid waste, sewage and rainwater and which tends to flood during monsoon • Water supply is provided by ULB / municipality; this is used for drinking purposes. • Households purchase water for domestic use; ₹13 per average bucket size. • • The nearest schools and hospitals are located at a distance of 2 km • Bus stop and railway stations are located at a distance of 5km • Few G+1 structures were observed within the existing settlement • Residents are not willing to relocate • There is no patta • Resident are involved in various livelihood activities such as daily wage laborers, services etc.

Location	Photographs	Observations
		
<p>Slum proposed for relocation (existing): Ponnagaram (not suitable for relocation)</p>	 	<ul style="list-style-type: none"> • Site observations suggest that continued encroachments to the existing settlement site may not be curtailed even after initial clearance activities. • Small shrines and churches are located within the encroachment area • Water supply is provided by the Dindigul Corporation • None of the households are connected to septic tank facilities; toilet and kitchen wastewater is directly discharged into the water body • At the time of the consultation, some residents expressed their willingness to relocate while others expressed reluctance. Therefore, there is a mixed response to proposed resettlement and this will require ongoing consultations. • Patta is not available • Residents are involved in various livelihood activities such as daily wage laborers, etc.
<p>Thoothukudi (Mapillaiurani) Not suitable for project readiness/ subproject selection– since the site is an existing salt plan and prone to flooding. The identified relocation site</p>		

Location	Photographs	Observations
at Mapillaiurani is not suitable for relocating people from (i) Veeranayakan thattu, (ii) Oorani otha veedu and (iii) Pandukarai, which are located at a distance of 15km from the Mapillaiurani (new relocation site).		
<p>Proposed Relocation Site (new): Thoothukudi (Mapillai Oorani)</p> <p>Date of Site visit: 29/11/2019</p> <p>Proposed components:</p> <ul style="list-style-type: none"> • 250 Dwelling units proposed • Provided with supporting services/ infrastructure (including approach road, water supply, electricity connection and SWM) 	  	<ul style="list-style-type: none"> • The resettlement site (Mapillai Oorani) does not have any sensitive receptors in the area. • The proposed resettlement site is free from encumbrance and there are no no-titled holders in the site; the settlement land belongs to TNSCB) •) • High voltage transmission lines / heavy polluting industries were not observed. • The proposed resettlement site is currently is utilized as an artificial salt pan and is situated close to an existing TNSCB housing (host communities). • Consultations with host communities i.e. residents of existing TNSCB housing, confirmed that the proposed resettlement site is prone to flooding during monsoon. • The salt pan will further require soil remediation prior to any civil works. • The existing TNSCB housing is poorly maintained and has no proper management of solid waste. There will be a difference in the proposed ADB housing, with all facilities and arrangements for operation and maintenance, and those living in existing housing, which could lead to conflicts. • The resettlement site can piggy back on supporting services currently provided to existing TNSCB housing such as approachable road, electricity, water supply (provided by the Thoothukudi Corporation), schools, bus stop etc. • Rehabilitation houses for Tsunami affected persons are located by the sea close to the proposed settlement site

Location	Photographs	Observations
<p>Slum proposed for relocation (existing): East Pandukarai</p>	  	<ul style="list-style-type: none"> • The encroached site belongs to Salt Corporation of India • Neyveli Lignite Corporation (NLC) Thermal Power Plant is located at a distance of 1.5 km from existing settlement • Water demand is met through Thoothukudi Corporation, water taps located at a distance of 500m • Three (3 no) of middle schools located within 1km radius • Electricity is available • None of the households are connected to septic tank facilities;toilet and kitchen wastewater is directly discharged into the water body • At the time of the consultation, some residents expressed their willingness to relocate while others expressed reluctance. Therefore, there is a mixed response to proposed resettlement and this will require ongoing consultations. • Patta is not available • Residents mentioned that they prefer to be close to the current site as they work in nearby areas. • Residents at this encroachment have been surveyed earlier by TNSCB for relocation / shifting.

Location	Photographs	Observations
<p>Slum proposed for relocation (existing): Oorani Otha Vedu</p>	  	<ul style="list-style-type: none"> • Few shrines/ temples are observed within the encroachments. • The encroached site belongs to Salt Corporation of India • Due to the alteration to the natural drains, the water logging issues are witnessed by the residents • Water demand is met through Thoothukudi Corporation • A middle school is located within 1.5km radius • Electricity is available • Few households are connected to individual septic tanks while other households directly discharge its wastewater into the water body. • At the time of the consultation, residents expressed reluctance to resettlement. • Patta is not available • Most residents are employed in the salt panning activities while other work as daily wagers,

Location	Photographs	Observations
<p>Slum proposed for relocation (existing): Veeranayakan Thattu</p>	 <p>The photographs show the slum environment. The top image is a street view with several thatched huts and a fence made of woven reeds. The middle image shows a group of people, including a man in a white shirt and a man in a red dhoti, talking to a man in a blue shirt. The bottom image shows a small building with a yellow door and a motorcycle parked nearby.</p>	<ul style="list-style-type: none"> • Water supply is provided by the Thoothukudi Corporation • Electricity is available in the site • Most residents work as daily wagers in a nearby banana cultivation, and salt pans • Consultations confirmed that the Upathu Odai river floods during monsoon • Some encroachments are temporary thatched huts while some are semi-permanent structures. • None of the households are connected to septic tank facilities; toilet and kitchen wastewater is directly discharged into the water body • At the time of the consultation, some residents expressed their willingness to relocate while others expressed reluctance. Therefore, there is a mixed response to proposed resettlement and this will require ongoing consultations. • There is no patta. • Most residents work as agriculture laborers.

Location	Photographs	Observations
<p>Slum proposed for relocation (existing): Vivekanadanagar (Tsunami affected fishing hamlet)</p>	 	<ul style="list-style-type: none"> • The existing dwelling units were constructed by the Annai Therasa NGO for tsunami affected persons, however these are still prone to natural hazards e.g. cyclones or future tsunami events • Hospital is located at a distance of 4 to 5 km • Water supply is provided by the Thoothukudi Corporation • Electricity is available to the hamlet • Most residents are fishing folks while others work in salt pans • Few households have septic tanks. • At the time of the consultation, residents expressed their reluctance to relocate due to livelihood issues / access to sea for fishing.

Site Visit Date: October 11, 2019

<p>Karakudi (Kalanivasal):</p> <p>Suitable for a sample subproject</p> <ul style="list-style-type: none"> • The resettlement site (Kalanivasal Village) does not have environmental sensitive areas in the vicinity • The resettlement site is approachable through an arterial road as well as from NH (connecting Karakudi to Trichy) • Milk processing unit is located close to the resettlement site • The site is free from flood hazard • The site is flat and it does not require any slope stabilization/ retaining walls or any special treatment for stability etc., • Trees located near the boundary of the resettlement site has to be preserved. Provision should be given during the design stage itself • HTL crossing are observed, however, it is far from the resettlement site • Schools and hospitals are located at a distance of 2 to 3 km radius • Water supply shall be provided by the Tamil Nadu Water Supply and Drainage Board (TWAD) 					
1.	<p>Kalanivasal Village (Site for the construction of the Tenements)</p>	<ul style="list-style-type: none"> • 900 Dwelling units are proposed to be constructed • Provided with basic amenities/ infrastructure (including approach road, water supply, EB and SWM) 	<ul style="list-style-type: none"> • The project area does not have any habitations/ encroachments • The land is classified as Government Poramboku (waste land) • A helipad was observed in the project area, which was constructed and used once during a visit made by Ex-chief minister for visiting the Karaikudi city • Milk processing for Aavin is located near to the project area. • The project area is accessible through National Highway (karakudi to Trichy) and an arterial road. • Schools (Chellapan Vidya Mandir) and 	<ul style="list-style-type: none"> • The drain pattern of the project area has to be studied. The natural flow of water should not be disturbed during the construction period • The soil in the project area seems to be more fertile and hence top soil preservation has to be adopted. • Consultations are required with the community (to be settled in the proposed Resettlement site) to get concurrence for resettlement arrangements • Stake holder consultation have to be conducted with the line departments for the supply of electricity, UGSS and SWM etc., • Use of groundwater for construction activities 	 <p>View of the site from the Helipad</p>  <p>Approach road to the site</p>

			<p>hospitals (government general hospital) are located within 2 km radius from the project area</p> <ul style="list-style-type: none"> • Karakudi Bus stand is located at a distance of 3km from the project site • The site does not have HTL crossings • The total extent of the land is 20.87 acres of which enter upon permission has been received for 11 acres • Water supply shall be provided by the Tamil Nadu Water Supply and Drainage Board (TWAD) through construction of OHT's 	<p>should be prohibited (alternate source should be identified)</p> <ul style="list-style-type: none"> • Provisions should be made in the design stage for the transplantation of the trees in the site (located near the boundary of the project area) • Presence of Archaeological survey of India (ASI) monuments (if any) in the project area should be indicated in the Checklist 	 <p>Location of the Project Site</p>
2.	Chellam Chetti Oorani	Existing encroachers are to be resettled at resettlement site at Kalanivasal Village	<ul style="list-style-type: none"> • Patta is not available • UGSS has been provided in the encroachment area • Encroachers are staying for more than 45 years • Most of them are working as daily labourers and housemaid workers • Government schools are located at a distance of 3km • Water supply is provided by the municipality • Proper toilet facilities (provided with septic tank) are not available, 	<ul style="list-style-type: none"> • Since the information on the encroachers are five-year-old, the catchment area of the water body has to be defined to estimate the actual number of encroachers • Consultations are required with the community (to be settled in the proposed Resettlement site) to get concurrence for resettlement arrangements • Proposed project related information has to be disclosed to the local people during the consultations for better understanding • Information pertaining to the 	 <p>View of Chellam Chetti Pond</p>

			<p>the wastewater has been discharged into the pond</p>	<p>flooding in that area and other disasters have to be highlighted/ justified for evacuating the people.</p>	 <p>Enrocachments on the LHS</p>
<p>3.</p>	<p>Malaikadu Kanmai</p>	<p>Existing encroachers are to be resettled at resettlement site at Kalanivasal Village</p>	<ul style="list-style-type: none"> • Patta is not available • Siltation/ Deeping of pond (under the Government of Tamil Nadu initiation for restoring the water bodies across all districts in Tamil Nadu state) has been observed • for several decades • Encroachers are staying for more than 45 years • Most of them are working as daily labourers and housemaid workers • Government schools are located at a distance of 3km • Water supply is provided by the karakudi municipality • Proper toilet facilities (provided with septic tank) are not available, 	<ul style="list-style-type: none"> • Similar to Chellam Chetti Oorani (Ref sl.no13) 	 <p>Siltation/ dredging in progress</p>  <p>Presence of Encroachments</p>

			<p>the waste water has been discharged into the pond</p>		 <p>Encroachments within the Pond area</p>
<p>4.</p>	<p>Vadaku oorani</p>	<p>Existing encroachers are to be resettled at resettlement site at Kalanivasal Village</p>	<ul style="list-style-type: none"> • Kodimaramathu Scheme (rejuvenation of surface water bodies under Government of Tamil Nadu Scheme) is under progress • Patta is not provided for the encroachers • Pucca and kutcha houses are observed • Proper approach road is available • Most of them are working as daily labourers and housemaid workers • Government schools are located at a distance of 1km • Water supply is provided by the Karakudi municipality • Proper toilet facilities (provided with septic tank) is observed in the site 	<ul style="list-style-type: none"> • Similar to Chellam Chetti Oorani (Ref sl.no13) 	 <p>View of Vadaku Oorani (Pond)</p>  <p>Encroachments on the bank of the Pond</p>

5.	Kilaku Oorani	Existing encroachers are to be resettled at resettlement site at Kalanivasal Village	<ul style="list-style-type: none"> • Patta is not provided for the encroachers • Pucca and kutcha houses are observed • For bathing, bathroom facilities are available at a distance of 1km from the Kuruchi Kanmai and it is maintained by the Karakudi Municipality • Proper approach road is available • Most of them are working as daily labourers and housemaid workers • Government schools are located at a distance of 1to 1.5 km • Water supply is provided by the Karakudi municipality • Proper toilet facilities (provided with septic tank) is observed in the site 	<ul style="list-style-type: none"> • Similar to Chellam Chetti Oorani (Ref sl.no13) 	 <p>Wild vegetations has covered the Pond</p>  <p>Encroachments on the bank of the Pond</p>
6.	Kuruchi Kanmai	Existing encroachers are to be resettled at resettlement site at to Kalanivasal Village	<ul style="list-style-type: none"> • Patta is not available • Pucca and kutcha houses are observed • Proper approach road is available • Most of them are working as daily labourers and housemaid workers • Government schools are located at a distance of 3 km • Water supply is provided 	<ul style="list-style-type: none"> • Similar to Chellam Chetti Oorani (Ref sl.no13) 	 <p>View of the Kuruchi Kanmai (Pond)</p>

			<p>by the Karakudi municipality</p> <ul style="list-style-type: none"> • Proper toilet facilities (provided with septic tank) is observed in the site 		 <p>Encroachments on the bank of the Pond</p>
7.	Vaith oorani	Existing encroachers are to be resettled at resettlement site at Kalanivasal Village	<ul style="list-style-type: none"> • Patta is not available • Pucca and kutcha houses are observed • Most of them are working as daily labourers (construction labourers) and housemaid workers • Encroachers are staying for more than 15 years • Based on the consultation, it is observed that some third-party agent has sold the land • Government schools are located at a distance of 2 to 3 km • Some of the houses are provided with borewell facility. For others, they have to depend on the water supply from Karakudi Municipality • Proper toilet facilities (provided with septic tank) is observed in the site 	<ul style="list-style-type: none"> • Similar to Chellam Chetti Oorani (Ref sl.no13) 	 <p>View of the Vaith oorani (Pond)</p>  <p>Encroachments on the bank of the Pond</p>

<p>8.</p>	<p>Veeriyam Kanmai</p>	<p>Existing encroachers are to be resettled at resettlement site at Kalanivasal Village</p>	<ul style="list-style-type: none"> • Patta is not available • Pucca and kutcha houses are observed • Most of them are working as daily labourers (construction labourers) and housemaid workers • Some of the encroachers are found to be carrying out businesses and others are working in government organizations/ departments • Out of 4 outlets from the water body, 2 outlets have been completely closed due to the encroachment. • Encroachers are staying for more than 40 years • Government schools are located at a distance of 2 to 3 km • Some of the houses are provided with borewell facility. For others, they have to depend on the water supply from Karakudi Municipality • Sewage water has been directly discharged in to the pond • During the consultation, some of the encroachers showed their willingness to relocated, but some of them have shown their 	<ul style="list-style-type: none"> • Similar to Chellam Chetti Oorani (Ref sl.no13) 	 <p>View of the Veeriyam Kanmai (Pond)</p>  <p>Sewage water discharged into the Pond</p>  <p>Encroachments are on the RHS</p>
-----------	------------------------	---	---	--	---

<p>9.</p>	<p>Kudikatha Nenthai Kanmai</p>	<p>Existing encroachers are to be resettled at resettlement site at Kalanivasal Village</p>	<p>restriction for relocation</p> <ul style="list-style-type: none"> • Patta is not available • Semi pucca and kutcha houses are observed • Most of the houses remain closed and only one house is occupied • Milk business is the source of income for the encroachers • Encroachers are staying for more than 40 years • Government schools are located at a distance of 5 km • Groundwater has been used for drinking and domestic purposes • The encroachers are not interested in relocating to Kalanivasal 	<ul style="list-style-type: none"> • Similar to Chellam Chetti Oorani (Ref sl.no13) 	 <p>View of the Kudikatha Nenthai Kanmai</p>  <p>Encroachments within the pond area</p>
<p>10.</p>	<p>Thangachi Oorani</p>	<p>Existing encroachers are to be resettled at resettlement site at Kalanivasal Village</p>	<ul style="list-style-type: none"> • Patta is not available • Semi pucca and kutcha houses are observed • Most of them are working as daily labourers (construction labourers) and housemaid workers • Encroachers are staying for more than 40 years • Government schools are located at a distance of 6 km • Water is supplied by the Karakudi municipality (once in 3 days for 30 minutes) • The encroachers are not 	<ul style="list-style-type: none"> • Similar to Chellam Chetti Oorani (Ref sl.no13) 	 <p>Wild vegetations has covered the Pond</p>

			<p>interested in relocating to Kalanivasal</p>		 <p>Consultation with the Encroachers</p>
<p>11.</p>	<p>Athi Thitavida Kanmai</p>	<p>Existing encroachers are to be resettled at resettlement site at Kalanivasal Village</p>	<ul style="list-style-type: none"> • Patta is not available • Semi pucca and kutcha houses are observed • Most of them are working as daily labourers (construction labourers) and housemaid workers • Encroachers are staying for more than 40 years • Government schools are located at a distance of 2 to 3 km • Water has been supplied by the Karakudi Municipality. Twice a week water has been supplied for 30 minutes • Sewage water has been directly discharged in to the pond • The encroachers are not interested in relocating to Kalanivasal 	<ul style="list-style-type: none"> • Similar to Chellam Chetti Oorani (Ref sl.no13) 	 <p>View of the Athi Thitavida Kanmai (Pond)</p>  <p>Sewage water discharged into the Pond</p>

					 <p>Encroachments on the LHS</p>
12.	Servar Oorani	Existing encroachers are to be resettled at resettlement site at Kalanivasal Village	<ul style="list-style-type: none"> • Patta is not available • Semi pucca and kutcha houses are observed • Most of encroachers are working as daily labourers (construction labourers) and housemaid workers • Encroachers are staying for more than 40 years • UGSS has been provided in the encroachment areas • Government schools are located at a distance of 2 to 3 km • Water has been supplied by the Karakudi Municipality. Twice a week water has been supplied for 30 minutes • Wash and kitchen waste water is directly discharged into the pond • The encroachers are not interested in relocating to Kalanivasal 	<ul style="list-style-type: none"> • Similar to Chellam Chetti Oorani (Ref sl.no13) 	 <p>View of the Servar Oorani (Pond)</p>  <p>Encroachments on the LHS</p>

					 <p>Consultation with the Encroachers</p>
--	--	--	--	--	--

Site Visit Date: September 17 – 27, 2019

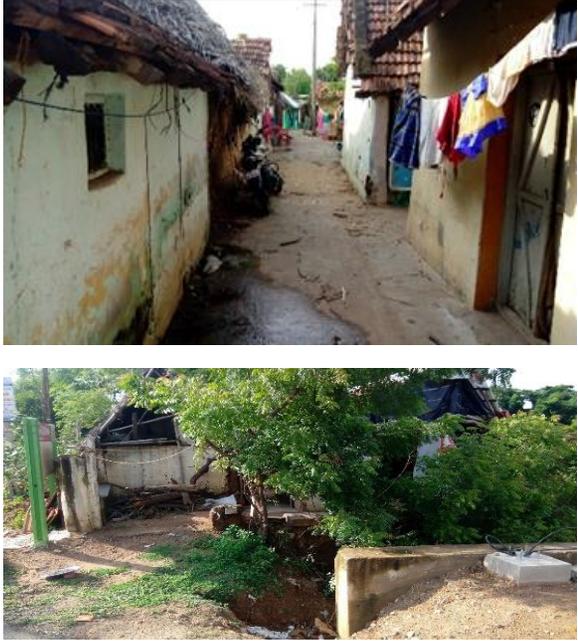
Location	Photographs	Observations
<p>POLLACHI - MGR NAGAR (NEAR COIMBATORE)</p>		
<p>Not suitable as a sample subproject - Some of the persons from total of five (5) slums identified for the proposed relocation reported that they have been issued patta and produced the same for verification. Furthermore, of the five (5) slums only two (2) slums are prone to some flooding.</p>		
<p>Proposed Relocation Site (new): POLLACHI – MGR Nagar</p> <p>Date of Site visit: 18.9.2019</p>		<ul style="list-style-type: none"> • Proposed relocation site within 2 km distance of the nearest town. However, lack of public transportation facilities available at the relocation site • The total proposed site is approximately 4.15 acres and located at a distance of 900m from the main road • No sensitive natural or human receptors in close proximity to the proposed relocation site; the nearest sensitive area is ANAMALAI at distance of 10km from the proposed site • Site is provided with an earthen drain • Minimal tree cutting is envisaged, vegetation comprises of medium size bushes and shrubs. • Water supply to the proposed relocation site will be tapped from the main water supply pipeline from AZHIYAR Dam with connections to be constructed, operated and maintained • SWM shall be arranged through the POLLACHI Municipality • No polluting industrial activities close by • The width of the main road is currently 6 m wide and will be widened to 9m as mandated by the local planning authority • The ‘natam’ or land surrounding the proposed site is private agricultural land. • Ground-water may be extracted for construction of housing unless there is no other water supply • Proposed site will have a 0.3 to 0.4 million liter per day (MLD) STP
<p>Slum proposed for</p>		<ul style="list-style-type: none"> • Dwelling units located close to the water canal / drain; unhygienic

Location	Photographs	Observations
<p>relocation (existing): POTTU MEDU – THANTHAI PERIYAR VEEDHI</p>		<p>living conditions observed</p> <ul style="list-style-type: none"> • Potentially prone to vector diseases • Drinking water provided by the local Municipality; however slum persons use it for only household purposes citing that it is not portable • Common toilets with septic tank provided at a distance from the slum • Residents have been provided with patta by the government and some have taken loans to build houses • No flooding reported (Consultations with community members at the slum suggest that they do not experience flood episodes from the exposed dirty water channel (width 10ft) that runs along the current settlement) • Easy access to livelihood activities • Easy access to social amenities • The water channel is mainly rain-fed from Krishnan-kuttai tank at a distance of approximately 40 km that is used for irrigation purposes and levels only rise during the rainy season between October and December. • The community members expressed their desire to dredge the canal of weeds and foliage and/or raise the embankment walls.
<p>Slum proposed for relocation (existing): MARAPETTAI PALLAM EAST</p>		<ul style="list-style-type: none"> • Dwelling units located close to the water canal / drain; unhygienic living conditions observed • Potentially prone to vector diseases • Drinking water provided by the local Municipality; however, slum persons use it for only household purposes citing that it is not portable • Common toilets provided at a distance from the slum but no septic tank leading to direct discharge into water canal • Residents have been provided with patta by the government • No flooding reported (Consultations with community members at the slum suggest that they do not experience flood episodes from the exposed dirty water channel that runs along the current settlement. Moreover, the embankment height / wall was raised

Location	Photographs	Observations
		<p>over three (3) years ago)</p> <ul style="list-style-type: none"> • Easy access to livelihood activities • Easy access to social amenities • Settlement is currently next to a water packing plant called Devkrish Aqua Systems, which discharges clear water in a storm-water drain running along the main street • There is no regular desilting carried out by the local municipality, therefore the water channel is full of foliage. •
<p>Slum proposed for relocation (existing): MARAPETTAI PALLAM WEST</p>		<ul style="list-style-type: none"> • Dwelling units located close to the water canal / drain; unhygienic living conditions observed • Potentially prone to vector borne diseases • Drinking water provided by the local Municipality • Common toilets provided at a distance from the slum • UGSS provision is available, however household connection is not provided • Flooding of low severity reported during rainy season • Residents have been provided with patta by the government • Easy access to livelihood activities • Easy access to social amenities • The entrance to the existing slum has a sewer pit but the HUs are not connected to this main and hence, all HU discharge sewage directly into the dirty water channel

Location	Photographs	Observations
<p>Slum proposed for relocation (existing): THANNACHIYAPPA N KOIL VEDDHI</p>		<ul style="list-style-type: none"> • Dwelling units located close to the water canal / drain that often gets blocked; unhygienic living conditions observed • Potentially prone to vector borne diseases • Drinking water provided by the local Municipality via common taps • Common toilets provided at a distance from the slum • Flooding of low severity reported during rainy season, with one major episode reported in 2015 • Residents have been provided with patta by the government • Easy access to livelihood activities <p>Easy access to social amenities</p> <ul style="list-style-type: none"> • The school going children usually walk to school.
<p>Slum proposed for relocation (existing): NEHRU NAGAR – KOTTU STREET</p>		<ul style="list-style-type: none"> • Dwelling units located close to the water canal / drain; unhygienic living conditions observed • Potentially prone to vector borne diseases • Drinking water provided by the local Municipality <p>Common toilets provided at a distance from the slum with discharge directly in the water canal / drain</p> <ul style="list-style-type: none"> • Consultations with community members at the slum suggest that there has been some flooding at least once every monsoon season; the main reason for flooding was attributed to non-servicing of the drainage by the municipality. • Residents have been provided with patta by the government • Easy access to livelihood activities <p>Easy access to social amenities</p>

Location	Photographs	Observations
<p>THANJAVUR- VALLAM</p> <p>Suitable as a sample subproject - the project proponent will be required to obtain all permissions / approvals from the relevant central, state and local government authorities.</p>		
<p>Proposed Relocation Site (new):</p> <p>TANJAVUR – VALLAM</p> <p>Date of Site Visit: 20.9.2109</p>		<ul style="list-style-type: none"> • The proposed relocation site is an abandoned gravel quarry. • It is located next to NH 67 in the south, SH 99 in the west and few settlements in the North and East directions • Proposed relocation site within 5 km distance of the nearest town and has easy access to public transportation facilities • Situated close to another relocation site (under construction), hence not isolated • Easy access to Thanjavur Government Hospital, distance 5 km • Easy access to local school, distance 1 km • No sensitive natural or human receptors in close proximity to the proposed relocation site • Tree cutting is not envisaged since the land is barren • Source of water supply will be through bore wells • SWM shall be arranged through the Vallam Town Panchayat • No polluting industrial activities nearby
<p>Slum proposed for relocation (existing):</p> <p>SRINIVASAPURAM SEKADI</p>		<ul style="list-style-type: none"> • Dwelling units located close to the water canal / drain; unhygienic living conditions observed • Potentially prone to vector borne diseases • Drinking water provided by the local Municipality • Toilet discharge is directly in the water canal / drain • No flooding reported, however houses are prone to damage during heavy rains

Location	Photographs	Observations
		<ul style="list-style-type: none"> • Residents do not have patta • Easy access to livelihood activities • Easy access to social amenities • A wall observed on side of the water way may be under the purview of the ASI
<p>KUMBAKONAM - SESHAMPADI</p> <p>Not suitable as a sample subproject: The proposed relocation site is not suitable due to its distance from the existing slums proposed for relocation to this site as well as distance to the nearest town center.</p>		

Location	Photographs	Observations
<p>Proposed Relocation Site (new): SESHAMPADI - KUMBAKONAM</p>		<ul style="list-style-type: none"> • The proposed relocation site, , is a greenfield located at a distance of 15 km from the main town. • There are no nearby transportation options or access • No sensitive natural or human receptors in close proximity to the proposed relocation site • Tree cutting is not envisaged; however, site is covered by vegetation - shrubs and bushes - that may be cleared. • Nearest school located at a distance of 2 km • Nearest hospital located at a distance of 4km in PATTEESWARAM • One OHT observed at the site and source of water supply will be through bore wells • SWM will be arranged through the local Panchayat (PATTEESWARAM) • Septic tank will be constructed for wastewater collection
<p>Slum proposed for relocation (existing): BANADURAI (AVN NAGAR)</p>		<ul style="list-style-type: none"> • Dwelling units located close to the water canal / drain; unhygienic living conditions observed • Potentially prone to vector borne diseases • Drinking water provided by the local Municipality • Common toilets • No flooding reported • Residents do not have patta • Slum located at distance of greater than 10 km from the proposed relocation site

VALLAM VADAGAL (KANCHIPURAM) - Industrial Housing Site for Migrant Workers

Location	Photographs	Observations
<p>The proposed site for industrial workers housing is located inside SIPCOT industrial estate and is suitable.</p>		
<p>Proposed Industrial Housing Site (new):</p> <p>VALLAM VADAGAL</p> <p>Date of visit : 23.09.2019</p>		<ul style="list-style-type: none"> • No sensitive natural receptors in close proximity to the proposed industrial housing site • On the western side of the proposed industrial housing, there is an existing host community in PALANALLUR village. These may share common supporting services with proposed housing such as sanitation, sewage industrial housing facilities. • Nearest hospital located at a distance of 5km • Nearest school located at a distance of 2.5km • Tree cutting maybe required for site clearance however emphasis will be given on retention of the same with optimum site design • Water supply will be through bore wells • SWM shall be managed by SIPCOT • Wastewater collection and treatment will be through a STP of adequate design and capacity
<p>KEERAPAKKAM</p> <p>Not suitable for sample subproject - most persons residing in existing slums proposed for relocation to this site reside in “pucca” / concrete buildings. Moreover, as per preliminary investigations, the proposed relocation site may be adjacent to the buffer of the NEMMELI Reserve Forest.</p>		
<p>Proposed Relocation Site (new):</p> <p>KEERAPAKKAM</p>		<ul style="list-style-type: none"> • The proposed relocation site (new) has an existing host (vulnerable) community residing within the proposed relocation site. This is further confirmed by the topographical survey that shows a total of seven (7) units/ dwellings and an OHT located within the proposed relocation site • As per the Google earth image, the proposed relocation site is under the influence of NEMMELI Reserve Forest. • Access to the proposed site is from SH 58

Location	Photographs	Observations
	 	<ul style="list-style-type: none">• Tree cutting maybe required for site clearance however emphasis will be given on retention of the same with optimum site design• Water supply will be through bore wells• SWM will be managed by THIRUKALUKUNDRAM town Panchayat

Location	Photographs	Observations
<p>Slum proposed to be relocation (existing): KOTHIMANGALAM LAKE AREA</p>		<ul style="list-style-type: none"> The slum has number of concrete houses, thereby making relocation difficult
<p>REDDIARPATTI (NEAR Tirunelveli)</p> <p>Suitable as a sample subproject: access to transportation, livelihood generation activities, no patta and most slums proposed for relocation are vulnerable to flooding</p>		

Location	Photographs	Observations
<p>Proposed Relocation Site (new): REDDIARPATTI</p> <p>Date of site visit: 26.09.2019</p>		<ul style="list-style-type: none"> • The proposed relocation site falls under the Municipal Corporation limits • It is well connected to NH7 and located at a distance of 4.5 km from the city bus terminus • It abuts private land on one side and is adjacent to an existing TNSCB settlement and upcoming (under construction) TNSCB settlement for about 450 families • All slums proposed for relocation to this new site are located at a distance of 9-10 km • No sensitive natural or human receptors in close proximity to the proposed relocation site • Leveling of land prior to construction is anticipated • It will require an environmental clearance (EC) from the state EIA authority due to the proposed built-up area of 45,000 square meters • Primary health care center located at a distance of 2.5 km • Proposed STP of adequate design and capacity will linked to the ongoing UGSS scheme • There is a private Children's Home next to the proposed site • Chicken coop (encroachment by private land owner) is on TNSCB land with some herb / fruit bearing trees that will be retained through optimum site design and allocation of open space
<p>Slum proposed or relocation (existing): KARUPANTHURAI at the banks of the THAMIRABARANI RIVER</p>		<ul style="list-style-type: none"> • Dwelling units situated along the banks of the river THAMIRABARANI • Area faced severe floods in years 1989,1992 and 2015 • Drinking water is supplied through Corporation • Encroachers are not having patta • SWM is maintained by the corporation • Street light facility is provided • Common toilets have been provided; however open defecation is common • Residents do not have patta • Livelihood opportunities available in nearby areas
<p>Slum proposed for relocation (existing):</p>		<ul style="list-style-type: none"> • Dwelling units situated along the banks of the river THAMIRABARANI • Area faced severe floods in years 1989,1992 and 2015

Location	Photographs	Observations
<p>WEST KOKARAKULAM at the banks of the THAMIRABARANI RIVER</p>		<ul style="list-style-type: none"> • Drinking water is supplied through Corporation • Encroachers are not having patta • SWM is maintained by the corporation • Street light facility is provided • Common toilets have been provided; however open defecation is common • Residents do not have patta • Livelihood opportunities available in nearby areas
<p>Slum proposed for relocation (existing): ELANTHAKULUM</p>		<ul style="list-style-type: none"> • Dwelling units are located in the ELANTHAI KULAM periphery area • Residents do not have patta • Concrete structures have been built on the lake-bed after filling • Religious structures constructed (church / temple) • Situated at a distance of 4.5 km from the proposed relocation site • Area prone to flooding • Drinking water is supplied through corporation; some of the dwelling units are having their own bore well facility • Street light facility is provided • SWM maintained by the corporation. • Common public toilets have been provided; however, open defecation is common

Location	Photographs	Observations
		<ul style="list-style-type: none">• Household wastewater directly discharges into the pond / tank (kulam)
		<ul style="list-style-type: none">• Place of worship on the bund of the pond
		<ul style="list-style-type: none">• Place of worship built within the pond, on the edge of the pond

Location	Photographs	Observations
<p>Slum proposed for relocation (existing): PILLAIKULAM</p>		<ul style="list-style-type: none"> • Dwelling units are located in the PILLAIKULAM periphery area • Residents do not have patta • Drinking water is supplied through bore well provided with a pump house • SWM is maintained by the Corporation • Some dwelling units have toilet facilities, however these discharges directly into the pond/ tank (kulam). • Most the dwelling units G+1 'pucca' / concrete structures • Street light facility is provided • It is located at a distance of 13 km from the proposed relocation site

Table A3.1. GENERAL ANTICIPATED IMPACTS – NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
All Subproject Components ³								
A. Physical Resources								
1	Climate Risks	Subproject vulnerability due to climate risks	M	Indirect/ Irreversible		X		<ul style="list-style-type: none"> Integrate climate change adaptation measures into detailed design Specifications for use of materials with the lowest embedded Greenhouse gases (GHG) Specify local materials from licensed and /or local providers that minimize transport distance Specify materials that are recycled, have recycled content or are from sustainable sources

¹In their bids, all contractors will be required to respond to the subproject specific IEE and EMP requirements, which shall take reference of the mitigation measures described in these Tables A3.1, A3.2 and A3.3 at a minimum. All contractors will be required to prepare a site-specific Environmental Management Plan (C-EMP) including sub-plans and Standard Operation & Maintenance Plans (SOMPs) detailed in Table 6.4 of the EARF. These plans will be prepared under the supervision of the TNSCB PIDs and in consultation and support of Urban Local Bodies (ULBs) as required. The plans will be reviewed and cleared by TNSCB PMU prior to any subproject activity. Each contractor will be required to assign a person responsible for environment, health and safety (Contractor-EHS) and grievance redress mechanism (Contractor-GRM) as well as for Asbestos Containing Materials (Contractor-ACM).

²With Category A excluded, the magnitude of impacts is predictable and will be relatively low for all subprojects. To maintain the integrity of the assessment process, the "Potential Impact" has been categorized as Low, Medium, High (L/M/H) while nature of impact is described as Direct / Indirect, Local/Regional, Reversible / Irreversible.

³Subproject components under new housing development will include a) New buildings for housing and other uses; b) Supporting services as such as electricity supply, water supply, onsite sanitation system e.g., a sewage treatment plant, septic tanks, etc., / wastewater collection, treatment and disposal; access roads; storm water drainage for runoff; rainwater harvesting tanks / pits, and solid waste management – segregation and collection.

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
2	Topography (Land and Vegetation)	Potential adverse impact on sensitive receptors ⁴	L	Direct/Local / Irreversible	X	x	X	<ul style="list-style-type: none"> Undertake detailed walk over survey to establish site conditions prior to any subproject activity Subproject selected to avoid sensitive receptors such as habitats of conservation value, households /structures, Physical Cultural Resources (PCRs) Locate site where there is low risk of flooding
		Lack of sufficient design and planning to ensure long term sustainability of subproject and protection of assets created	L	Direct/Local / Irreversible	X	x	X	<ul style="list-style-type: none"> Detailed design to integrate recommendations from geo-tech / topo investigations for site planning and civil works for all new housing development and supporting services Site design to allow efficient drainage and maintain natural drainage patterns Consider potential impacts from extreme weather events in design of subproject components Detailed design will include

⁴“Receptor”: the resource (human / natural environment / economic / social) that is potentially going to receive and have to cope with an impact; “Sensitivity”: ability to cope with an impact and/or its importance to India. It is generally accepted that human health is always a high sensitivity receptor, however in terms of environmental/natural resources, the sensitivity varies according to the receptor e.g. scrubland with no significant biodiversity is considered less sensitive than a water body which may support aquatic ecosystems, local biodiversity and/or livelihoods through fishing or marine tourism. “Magnitude”: the size of the potential impact. Impacts may be short term and considered low magnitude (e.g. noise, dust or vibration) or high magnitude and long term (e.g. global impacts due to the project).

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								provisions for ensuring effective maintenance and protection of assets created
		Change in the natural physical features and current aesthetics due to the construction and operation of the subproject	H	Direct/Local / Reversible	X	x	X	<ul style="list-style-type: none"> • Vegetation clearances strictly restricted to the works sites • Minimize permanent and temporary land take for civil works • All temporary land-take resorted to pre-construction conditions • Develop and implement <ul style="list-style-type: none"> ○ Site Restoration Plan (after completion of civil works) ○ New Housing Development Standard Operation & Maintenance Plan (during operation)
		Stockpiling of materials	H	Direct/Local / Reversible		x		<ul style="list-style-type: none"> • Storage of construction material confined to work sites in a way to ensure that there is no obstruction to natural drainage pattern, efficient drainage is maintained • Stockpiles to be covered to reduce dust generation • Develop and implement – <ul style="list-style-type: none"> ○ Materials Management Plan (including warehouses / storage)
		Borrow pits / Spoils re-use /	H	Direct/Local / Reversible	X	x		<ul style="list-style-type: none"> • Borrow pits and spoils disposal sites (if any), identified and

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
		disposal						<ul style="list-style-type: none"> utilized as per pre-approved plans from the relevant authority To be located at least 100m from existing residential areas to reduce dust and noise from these sites Vehicles covered during transportation to avoid spillage Rehabilitate and vegetate spent borrow areas and spoil disposal sites as soon as possible after closure to prevent soil erosion and dust generation Develop and implement – <ul style="list-style-type: none"> Spoils Re-use / Disposal Plan
		Sources of materials	M	Direct/Local / Reversible	x	x		<ul style="list-style-type: none"> Maximize the re-use of earth-cut materials, spoils, and construction & demolition debris / wastes Specify materials that are recycled, have recycled content or are from sustainable sources In case required, use borrow pits licensed by the relevant authority, if the re-use options are not feasible
		Hazardous materials	H	Direct/Local / Reversible	x	x	X	<ul style="list-style-type: none"> Temporary secured area set up for storage and handling of hazardous and polluting materials Design, as needed, a permanent ('bunded')

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								<p>impermeable surface capable of carrying 110% volume of materials for accidental spills or leakage</p> <ul style="list-style-type: none"> • Delivery and acceptance of all hazardous materials / equipment will be accompanied by a Materials Safety Data Sheets (MSDS) and/or be certified that it is polychlorinated biphenyl-free (PCB) free • Licensed vendors/ companies to collect transport and dispose used / unused hazardous materials / wastes • Vehicle / equipment maintenance and refueling to be done offsite or within designated service area on impermeable surfaces and away from water sources / water bodies • Develop and implement – <ul style="list-style-type: none"> ○ Hazardous Materials Control Plan
3	Physical Cultural Resources (PCRs)	Potential impact on archaeological , historical or cultural important sites	L	Direct/Local / Reversible		X	x	<ul style="list-style-type: none"> • Detailed walk over survey / and buffer selection to avoid sensitive receptors such as PCRs • Establish and implement (as required “Chance Find Procedures’ • Consult with local ASI office if any construction activities in

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								close proximity to World / Local Heritage Sites and obtain prior permission (requires prior permission of ASI for undertaking works within 100-300 m of the boundary of the protected / heritage monuments). <ul style="list-style-type: none"> Any impact on heritage needs to be assessed and included within the environmental assessment process. This includes the need to conduct and implement Heritage Impact Assessment and Management Plan in close consultation and support of the ASI Conduct training of works on PCR's and Chance Find Procedures during orientation / induction
B. Environmental Resources								
1	Air Quality	Impact on air quality during general construction activities due to increase in dust emissions and vehicular emissions	H	Direct/Local / Reversible		x	x	<ul style="list-style-type: none"> Work sites to be enclosed / barricaded Air quality monitoring once before the start of civil works to establish the baseline; monthly during the civil works (as per the confirmed construction schedule) and once after completion of the civil works (location: at new housing development)

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact	Nature of impact	Project Stage			Mitigation measures ¹
			L/M/H ²		Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								<ul style="list-style-type: none"> • Periodic watering at construction sites, construction staging areas, unpaved areas, exposed dust prone construction stockpiles • Maintenance of project construction vehicles, equipment, machinery, etc. • Control vehicle speed to ≤ 8 km/h in unpaved areas including unpaved approach roads; Post the speed limit sign in these areas • Install wheel washing equipment or conduct wheel washing manually at each exit of the construction sites and at asphalt/concrete mixing stations to prevent trucks from carrying muddy or dusty substances on public roads • Store dust-prone materials in areas with shelters on four sides and on top; If such materials have to be stored in open area, cover with strong tarpaulin • Vehicles with an open load-carrying case, which transport potentially dust-producing materials, shall have proper fitting sides and tail boards; Dust-prone materials shall not be loaded to a level higher than

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								the side and tail boards, and shall always be covered with a strong tarpaulin <ul style="list-style-type: none"> Develop and implement - <ul style="list-style-type: none"> Dust Control Plan
2	Noise	Noise/vibration due to general construction activities and vehicular movement	H	Direct/Local / Reversible	X	x	x	<ul style="list-style-type: none"> Noise level measurements once before the start of the civil works to establish the baseline; monthly during the civil works (as per the confirmed construction schedule) and once after completion of the civil works (location: new housing development) Proper maintenance of vehicles / equipment/ machineries so that the ambient noise standards are met, refer to Section 2 of EARF Restriction of noise generating activities at night or if required, no night time construction within 500 m of the nearest household) Restrictions on the movement of heavy construction vehicles at night Use of Personal Protective Equipment (PPE) like ear plugs, mufflers, etc. Develop and implement – <ul style="list-style-type: none"> Noise Control Plan
3	Surface and Ground Water Quality	Pollution due to runoff from general	H	Direct/Local / Reversible	X	x		<ul style="list-style-type: none"> Surface and ground water quality monitoring once before start of civil works to establish

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
		<p>construction activities</p> <p>Siltation of water sources / water bodies due to spillage of construction wastes / slurry</p>						<p>the baseline; once during civil works and once after completion of civil works (location: new housing development)⁵</p> <ul style="list-style-type: none"> • Construction / workers camps, stockpiles of materials, etc., to be located away from water bodies / water sources / drainage leading to water bodies / water sources • No disposal of construction & demolition debris / wastes into water bodies / water sources • Collect wastewater from construction activities in sedimentation tanks, retention ponds, and filter tanks to remove silts and oil • Install and operate temporary silt traps along drainage and/or sedimentation tanks on construction sites to treat and process water and muddy runoff with high concentrations of suspended solids. If necessary, use flocculants such as polyacrylamide (PAM) to

⁵ Mitigation of water quality impact during construction shall be based on site specific water quality monitoring results conducted once before start of civil works to establish baseline. In India, the Central Pollution Control Board has identified water quality requirements in terms of a few chemical characteristics, known as primary water quality criteria. Further, Bureau of Indian Standards has also recommended water quality parameters for different uses in the standard IS 2296:1992. Weblink: <http://cwc.gov.in/sites/default/files/annexure-2.pdf>

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								facilitate sedimentation <ul style="list-style-type: none"> • If there are nearby public sewers, install pipelines to convey sewage / wastewater to public sewers • No vehicle / equipment / machinery maintenance activity close to water bodies / water sources / drainage • Develop and implement – <ul style="list-style-type: none"> ○ Construction Wastewater Management Plan
		Pollution due to oil / lubricant / fuel spillage	M	Direct/Local / Reversible	X	x	x	<ul style="list-style-type: none"> • Temporary secured area set up for storage and handling of hazardous and polluting materials with a containment tray or provided with bunds • Design, as applicable, a permanent ('bunded') impermeable surface capable of carrying 110% volume of materials for accidental spills or leakage; site it at least 100 m away from water bodies/ water sources / drainage • Develop and implement – Spills Response Plan <ul style="list-style-type: none"> ○ Provide with cleanup kits ○ Keep a stock of absorbent materials (e.g. sand, earth or commercial products)

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								<ul style="list-style-type: none"> on site to deal with spillages and train staff in their use <ul style="list-style-type: none"> ○ Protocol for immediate action utilizing absorbents (final disposal at an approved waste disposal facility) • If refueling in the field is required, it shall be done from road-licensed fuel trucks away from water bodies / water sources / drainage
4	Soil and Geology	Damage due to seismic activity	L	Direct/Regional/Irreversible		x		<ul style="list-style-type: none"> • Site selection and design considering the geological conditions; design should consider seismicity as per national guidance on seismic design that calls for identification of a maximum credible earthquake scenario and associated ground acceleration parameters • Tamil Nadu is in Zone II and III
		Soil erosion	M	Direct/Local / Reversible		x	x	<ul style="list-style-type: none"> • Avoidance of new housing development on sites that are prone to the soil erosion • Detailed design to integrate recommendations from geo-tech / topo investigations • Soil quality testing as part of the detailed engineering design scope

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								<ul style="list-style-type: none"> • Consideration of suitable slope and soil type • Proper land leveling and grading for stabilization and other erosion-prone working areas, at spoils disposal sites and permanent stabilization measures at least within 30 days of end of construction period • Close attention to drainage provision; maintain natural drainage patterns • Restore vegetation cover on any backfilled areas to prevent soil erosion; If restoration is carried out during periods of hot or extreme weather, ensure adequate aftercare to maximize survival
		Pollution due to oil / lubricant / fuel spillage	M	Direct/Local / Reversible	x	x		<ul style="list-style-type: none"> • Temporary secured area set up for storage and handling of hazardous and polluting materials with a containment tray or provided with bunds • Design, as applicable, a permanent ('bunded') impermeable surface capable of carrying 110% volume of materials for accidental spills or leakage; site it at least 100 m away from water bodies/ water sources / drainage

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹	
					Design & Pre-construction	Construction	Operation		
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES									
								<ul style="list-style-type: none"> • Develop and implement – Spills Response Plan • If refueling in the field is required, it shall be done from road-licensed fuel trucks away from water bodies / water sources / drainage 	
C. Ecological Resources									
1	Terrestrial Ecology	Loss of ecology	L	Direct/Local / Irreversible		x	x	x	<ul style="list-style-type: none"> • Undertake detailed walk over survey to establish site conditions prior to any subproject activity • No use of chemicals (pesticides / herbicides) • Minimize vegetation clearing confined to the footprint of work (construction and construction staging) sites • Avoidance of tree cutting at new housing development • Plant trees and re-vegetate the site immediately after construction; Only native plant species of local prevalence will be used for re-vegetation • Restoring temporarily disturbed areas / land take to pre-construction conditions • Develop and implement – <ul style="list-style-type: none"> ○ Site Restoration Plan (after completion of civil works) ○ New Housing

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								Development Standard Operation & Maintenance Plan (during operation stage)
2	Terrestrial Fauna	Species vulnerability to anticipated change in habitat	L	Direct/Local / Irreversible	x			<ul style="list-style-type: none"> • None anticipated since new housing development located in urban and peri-urban areas with access to economic services / activities; but will be re-assessed for each specific subproject • If required, undertake ground surveys to assess impacts of subproject activity / any constructed new access / approach roads situated close to habitat of conservation value to inform the detailed design and incorporate relevant mitigation measures in the environmental assessment
3	Avifauna	Disturbance to the local avifauna	L	Direct/Local / Irreversible	x			<ul style="list-style-type: none"> • None anticipated since new housing development located in urban and peri-urban areas with access to economic services / activities • Allocation of open space reservation (OSR) equivalent to 10 percent of total area at a resettlement site; and additional 15 percent of green belt area for subprojects that require

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹	
					Design & Pre-construction	Construction	Operation		
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES									
								Environmental Clearance (EC) ; this is anticipated to attract local avifauna	
4	Aquatic Ecology	Not anticipated	L	Direct/Local / Irreversible		x		<ul style="list-style-type: none"> • None anticipated since new housing development will not be situated in close proximity to rivers or lakes, but will be re-assessed for each specific subproject • If required, undertake surveys to assess impacts of subproject activity / any constructed new access / approach roads situated close to rivers or lakes to inform the detailed design and incorporate relevant mitigation measures in the environmental assessment 	
D. Human Environment									
1	Occupational Health and Safety	Exposure to hazards for workers working on asphalt mixing, concrete mixing, cement, etc.	H	Direct/Local / Reversible		x	x	x	<ul style="list-style-type: none"> • Develop and implement – Occupational Environment, Health and Safety (EHS) Plan and Emergency Response Plan (ERPs) at work sites <ul style="list-style-type: none"> ○ E.g. IFC (WB) EHS Guidelines on Occupational Environment, Health and Safety ○ Strictly enforce the use of PPE during

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								<p>construction such as goggles, gloves, noise reducing mufflers, head-lamps, stand-alone outdoor lighting, high visibility safety vests with reflective striping for night-time works (if any), and respirators to construction workers doing asphalt concrete and cement concrete road paving to minimize skin exposure to and inhalation of fumes and dust</p> <ul style="list-style-type: none"> ○ Training of workers for specific type of work engagement, e.g. STP operation and maintenance, sludge handling and disposal, electric transformer operation and maintenance, pumping equipment operation and maintenance, CNG/ LPG / Diesel genset operation and maintenance, etc. ○ Create awareness health & safety risks of transmittable diseases

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								(HIV/AIDs / COVID-19), child labor, bonded labor or forced labor
		Fires, explosion and other accidents	H	Direct / Local / Irreversible		x	X	<ul style="list-style-type: none"> Strictly enforce the use of PPE during construction and operation and maintenance Develop and implement – Occupational EHS Plan and ERP during construction and operation Regular inspection of equipment / machineries for faults Log accidents
		Provision of construction / workers accommodation	H	Direct/Local / Reversible		x		<ul style="list-style-type: none"> Provide adequate workers accommodation in line with IFC (WBG) guidelines IFC Guidance Note/ Workers Accommodation
		Unhygienic conditions at construction / workers camps	H	Direct/Local / Reversible		x		<ul style="list-style-type: none"> Provide water and sanitation facilities (situated separately for men and women); regular cleaning and disinfection of camps Provide temporary electricity connection Provide portable water / storage tanks Provide health checkup / access to medical care Provide waste bins and collection, no final disposal

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹	
					Design & Pre-construction	Construction	Operation		
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES									
								onsite • Discharge construction / workers camp sewage / wastewater into onsite septic tanks or connect to local public sewer system	
2	Community Health and Safety	Excessive disturbance to communities due to prolonged construction	M	Direct/Local / Reversible		x	x	X	<ul style="list-style-type: none"> • Meaningful consultations with communities to keep them informed of anticipated activities, in particular those that may result in disruption with respect to area access, utilities, and noisy or dust-generating activities that are likely to result in significant disturbance • Identify and adhere to strict construction schedule • Liaise with schools that are in close proximity to construction sites on school examination periods and scale down construction activities during such periods • Alert communities and residents if night time construction work shall occur nearby (no night time construction within 500 m of the nearest household) and ensure alternative access is provided • Ensure communities are aware of Grievance Redress Mechanism (GRM) entry points • Create awareness of health &

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								<p>safety risks of transmittable diseases (HIV/AIDs / COVID-19), child labor, bonded labor or forced labor</p> <ul style="list-style-type: none"> • Develop and implement – <ul style="list-style-type: none"> ○ Community Health and Safety Plan
		Temporary traffic management	M	Direct/Local / Reversible	X	x		<ul style="list-style-type: none"> • Develop and implement - Traffic Control Plan together with the local traffic police prior to any construction activities • Avoid high density areas for movement of construction vehicles • Proper traffic signs at the construction sites with information on nature and duration of work for public safety • Schedule transport routes and activities during non-peak hours; in case of lane closures, deploy workers to direct traffic • Erect speed limit signs of 8 km/h on all unpaved approach roads and unpaved construction site areas as a means of controlling fugitive dust emission in unpaved areas
		Access to construction sites	M	Direct/Local / Reversible		x		<ul style="list-style-type: none"> • Make all sites secure, and discourage access by members of the public through appropriate fencing, signage

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								and/or security personnel, as appropriate
		Utility services interruptions	M	Direct/Local / Reversible		X	x	<ul style="list-style-type: none"> Assess construction locations in advance and identify potential for disruption to utility services and risks before starting construction Any damage or hindrance/disadvantage to local communities, businesses, persons, etc., caused by the premature removal or insufficient replacement of public utilities is subject to full compensation, at the full liability of the contractor who caused the problem If temporary disruption is unavoidable, develop a plan in collaboration with relevant local authorities such as power company, water supply company and communication company to minimize the disruption and communicate the dates and duration in advance to affected communities / persons / businesses
		Information disclosure	H	Direct/Local		x	x	<ul style="list-style-type: none"> Conduct meaningful consultations to inform nearby residents and businesses in advance of the construction activities, given the dates and duration of expected disruption

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹	
					Design & Pre-construction	Construction	Operation		
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES									
								<ul style="list-style-type: none"> and make aware of the subproject GRM entry points Erect construction billboards, which include construction contents, schedule, responsible person and complaint phone number, at the entry to each construction site and construction staging area Place clear signs at construction sites in view of the public, warning people of potential dangers such as moving vehicles, hazardous materials, etc. and raising awareness on safety issues 	
4	Socio-economics	Beneficial impacts / job opportunities Influx of migrant workers	H	Direct/ Regional		x	X	<ul style="list-style-type: none"> Hiring for temporary construction jobs; emphasis to local hiring to avoid social conflict Overall economic growth of the region 	
New Buildings for Housing and Other Uses									
1	Topography (Land and Vegetation)	Lack of sufficient design and planning to ensure long term sustainability of subproject and protection	L	Direct/Local / Reversible		X	x	x	<ul style="list-style-type: none"> Implement mitigation measures for potential environmental impacts on Topography as listed under "All Subproject Components" sub-heading; and the following: New housing development located on vacant land

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
		of assets created						<ul style="list-style-type: none"> Detailed design to integrate Bureau of Indian Standards (BIS) code for buildings Design an energy efficient layout Allocation of open space reservation (OSR) equivalent to 10 percent of total area at a resettlement site; and additional 15 percent of green belt area for subprojects that require Environmental Clearance (EC); these will either retained and/or maintained to improve aesthetics Existing trees to be retained, plant new trees and re-vegetate site immediately after completion of construction / civil works Operation & Maintenance (O&M) manuals for buildings as per recommendations of SH architects / engineers
2	Air Quality	Impact on air quality during general construction activities due to increase in dust emissions and vehicular emissions	H	Direct/Local / Reversible	x	x	X	<ul style="list-style-type: none"> Implement mitigation measures for potential environmental impacts on Air Quality as listed under "All Subproject Components" sub-heading; and the following: Mitigate fumes and particulate matter from concrete batching units as follows: <ul style="list-style-type: none"> Locations for hot

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								<p>mix/concrete batching stations must be at least 300 m downwind of the nearest existing household</p> <ul style="list-style-type: none"> ○ Confined within work sites that are enclosed and barricaded ○ Equip hot mix/ concrete batching stations with fabric filters and/or wet scrubbers to reduce the level of dust emissions
3	Noise	Noise / vibration due to general construction activities	H	Direct/Local / Reversible	x	x		<ul style="list-style-type: none"> • Implement mitigation measures for potential environmental impacts for Noise as listed under “All Subproject Components” sub-heading; and the following: • Placement of hot mix / batching units confined within work sites that are enclosed and barricaded
4	Surface and Ground Water Quality	<p>Pollution due to runoff from general construction and operation activities</p> <p>Siltation of water sources / water bodies</p>	H	Direct/Local / Reversible	x	x	X	<ul style="list-style-type: none"> • Implement mitigation measures for potential environmental impacts on Surface and Ground Water Quality as listed under “All Subproject Components” sub-heading; and the following: • All buildings for housing and other uses shall be connected to a trunk sewer that will connect to onsite Sewage

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹	
					Design & Pre-construction	Construction	Operation		
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES									
		due to spillage of construction wastes / slurry						Treatment Plant (STP); no direct discharge to drainage, water bodies or water sources or nearby community resources <ul style="list-style-type: none"> • Kitchen wastewater from housing will be treated onsite in a Wastewater Treatment Plant (WWTP), recycled and reused for watering of plants, trees, etc.; no direct discharge to drainage, water bodies or water sources or nearby community resources • All housing units will have connection to water supply that shall meet the designated standards; refer to details in "Water Supply" section of Table A3.1 . 	
5	Soil and Geology	Soil erosion; Pollution due to oil / lubricant / fuel spillage	M	Direct/Local / Reversible		x	x	<ul style="list-style-type: none"> • Implement mitigation measures for potential environmental impacts on Soil and Geology as listed under "All Subproject Components" sub-heading 	
Access Roads within New Housing Development / Upgrade of Approach Roads to New Housing Development									
1	Topography (Land and Vegetation)	Lack of sufficient design and planning to ensure long term sustainability	L	Direct/Local / Reversible		x	x	X	<ul style="list-style-type: none"> • Implement mitigation measures for potential environmental impacts on Topography as listed under "All Subproject Components" sub-heading; and the following: • Detailed design to integrate

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹	
					Design & Pre-construction	Construction	Operation		
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES									
		of subproject and protection of assets created						<p>recommendations as per geo-tech / topo investigations such as for: road alignment, road surface</p> <ul style="list-style-type: none"> • Design to maximize the re-use of earth-cut materials (if any), spoils, and construction & demolition debris/ wastes, including the re-use of old asphalt or concrete road pavements for subgrade materials • Minimize temporary land take for road works • All temporary land-take resorted to pre-construction conditions • Develop and Implement - <ul style="list-style-type: none"> ○ Site Restoration Plan (after completion of civil works) ○ New Housing Development Standard Operation & Maintenance Plan (during operation stage) • Regularly inspect and maintain the road surface 	
2	Air Quality	Impact on air quality during general construction activities due to increase in	H	Direct/Local / Reversible		x	x	X	<ul style="list-style-type: none"> • Implement mitigation measures for potential environmental impacts on Air Quality as listed under "All Subproject Components" sub-heading; and the following:

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
		dust emissions and vehicular emissions						<ul style="list-style-type: none"> Mitigate fumes and particulate matter from asphalt mixing stations as follows: <ul style="list-style-type: none"> Locations for asphalt mixing stations must be at least 300 m downwind of the nearest existing household Confined within work sites that are enclosed and barricaded Equip asphalt mixing stations with fabric filters and/or wet scrubbers to reduce the level of dust emissions
3	Noise	Noise / vibration due to general construction activities	H	Direct/Local / Reversible	x	x		<ul style="list-style-type: none"> Implement mitigation measures for potential environmental impacts for Noise as listed under "All Subproject Components" sub-heading; and the following: Placement of asphalt mixing units confined within enclosed and barricaded spaces
4	Surface and Ground Water Quality	Pollution due to runoff from general construction activities Siltation of	H	Direct/Local / Reversible	X	x	x	<ul style="list-style-type: none"> Implement mitigation measures for potential environmental impacts on Surface and Ground Water Quality as listed under "All Subproject Components" sub-heading; and the following: Design of access roads /

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
		water sources / water bodies due to spillage of construction wastes / slurry						upgrade of approach roads to ensure no alteration of natural drainage pattern <ul style="list-style-type: none"> Maintain a buffer from any water bodies / water sources such that it does not lead to an alteration of surface water hydrology due to increase in sediment load due to construction waste run-off
5	Soil and Geology	Soil erosion; Pollution due to oil / lubricant / fuel spillage	M	Direct/Local / Reversible	X	x	X	<ul style="list-style-type: none"> Implement mitigation measures for potential environmental impacts on Topography as listed under "All Subproject Components" sub-heading
Stormwater Drainage								
1	Topography (Land and Vegetation)	Lack of sufficient design and planning to ensure long term sustainability of subproject and protection of assets created	L	Direct/Local / Reversible	x	x	x	<ul style="list-style-type: none"> Implement mitigation measures for potential environmental impacts on Topography as listed under "All Subproject Components" sub-heading; and the following: Detailed design to integrate recommendations as per geo-tech / topo investigations such as for: drainage alignment and depth Drainage works confined to work sites within new housing development and barricaded and enclosed

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								<ul style="list-style-type: none"> • Drainage works designed to utilize and maintain natural drainage patterns and to blend in the environment • Minimize permanent and temporary land take for civil works • All temporary land-take resorted to pre-construction conditions • Develop and implement <ul style="list-style-type: none"> ○ Site Restoration Plan (after completion of civil works) ○ New Housing Development Standard Operation & Maintenance Plan (during operation stage) • Regularly inspect (frequency - once per week) and maintain stormwater drainage system, e.g. silt accumulation, odor, obstruction, livestock discharge
2	Air Quality	Impact on air quality during general construction activities due to increase in dust emissions and vehicular emissions	H	Direct/Local / Reversible		x	x	<ul style="list-style-type: none"> • Implement mitigation measures for potential environmental impacts on Air Quality as listed under "All Subproject Components" sub-heading
3	Noise	Noise / vibration due	H	Direct/Local / Reversible		X	x	<ul style="list-style-type: none"> • Implement mitigation measures for potential environmental

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹	
					Design & Pre-construction	Construction	Operation		
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES									
		to general construction activities						impacts for Noise as listed under "All Subproject Components" sub-heading	
4	Surface and Ground Water Quality	Pollution due to runoff from general construction activities; siltation of water sources due to spillage of construction wastes and run-off during operation stage	H	Direct/Local / Reversible		X	x	X	<ul style="list-style-type: none"> Implement mitigation measures for potential environmental impacts on Surface and Ground Water Quality as listed under "All Subproject Components" sub-heading; and the following: Run-off during operation stage to adequate receiving body e.g. rainwater harvesting pits / tanks, without causing on-site / off-site adverse environmental impacts
5	Soil and Geology	Soil erosion; Pollution due to oil / lubricant / fuel spillage	M	Direct/Local / Reversible		X	x	X	<ul style="list-style-type: none"> Implement mitigation measures for potential environmental impacts on Soil and Geology as listed under "All Subproject Components" sub-heading; and the following: Run-off during operation stage to adequate receiving body e.g. rainwater harvesting pits / tanks, without causing on-site / off-site adverse environmental impacts
Sanitation System – Sewage Treatment Plant - STP / Wastewater Treatment Plant - WWTP									
1	Topography (Land and Vegetation)	Lack of sufficient design and	L	Direct/Local / Reversible		x	x	x	<ul style="list-style-type: none"> Implement mitigation measures for potential environmental impacts on Topography as

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact	Nature of impact	Project Stage			Mitigation measures ¹
			L/M/H ²		Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
		planning to ensure long term sustainability of subproject and protection of assets created						listed under "All Subproject Components" sub-heading; and the following: <ul style="list-style-type: none"> • Design a STP / WWTP of appropriate capacity, technology corresponding to the number of buildings for housing and other uses to capture sewage and wastewater discharge (e.g. from kitchens) • Detailed design to integrate recommendations as per geo-tech / topo investigations such as for: site preparation, laying of sewer lines, wastewater pipe lines, manholes, etc. • Siting of STP/ WWTP away from new buildings for housing; at least 100 m distance • Underground sewer lines to carry sewage from households to trunk sewers and further to STP; therefore sewer line placement away from water supply lines / wastewater pipe lines and drainage; at least 1 m depth below water supply lines / wastewater pipe lines • Minimize permanent and temporary land take for civil works • All temporary land-take resorted to pre-construction conditions • Develop and implement

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								<ul style="list-style-type: none"> ○ Site Restoration Plan (after completion of civil works) ○ New Housing Development Standard Operation & Maintenance Plan (during operation stage) ● Develop and Implement – Sludge Management and Disposal / Re-use Plan <ul style="list-style-type: none"> ○ Treated sludge to meet applicable discharge standards as set by TNPCB⁶ and should be disposed at authorised landfills/ disposed with municipal organic waste⁷ ● Treated wastewater to meet effluent discharge standards; refer to Appendix 13 ● Regularly inspect and maintain STP, WWTP, sewer lines, wastewater pipe lines for silt accumulation, overflows, blockages, H₂S buildup, etc.
2	Air Quality	Impact on air quality during general construction	H	Direct/Local / Reversible		x	X	<ul style="list-style-type: none"> ● Implement mitigation measures for potential environmental impacts on Air Quality as listed under “All Subproject

⁶The STP shall be designed to meet the latest standards defined in Appendix 12.

⁷ Treated effluent and sludge shall be reuse as per guidelines of Central Public Health and Environmental Engineering Organization (CPHEEO), Appendix 13.

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
		activities due to increase in dust emissions, vehicular emissions and operation activities such as foul smell and odour						<p>Components” sub-heading; and the following:</p> <ul style="list-style-type: none"> Dense plantation in the periphery of STP/ WWTP to avoid adverse impacts on aesthetics and reduce odour / foul smell Install odor collection and treatment devices, if necessary
3	Noise	Noise / vibration due to general construction & operation activities	H	Direct/Local / Reversible		x	X	<ul style="list-style-type: none"> Implement mitigation measures for potential environmental impacts for Noise as listed under “All Subproject Components” sub-heading; and the following: Deploy low noise pumps or other equipment with sound insulation including enclose pumps with a sound proof structure. Pump station located at least 100 m from the nearest new building for housing
4	Surface and Ground Water Quality	<p>Pollution due to runoff from general construction activities and operation</p> <p>Siltation of water bodies /</p>	H	Direct/Local / Reversible		x	x	<ul style="list-style-type: none"> Implement mitigation measures for potential environmental impacts on Surface and Ground Water Quality as listed under “All Subproject Components” sub-heading and the following: No direct discharge to drainage, water bodies or water sources or nearby community

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
		sources due to spillage of construction wastes						
		Domestic wastewater / sewage from sanitary facilities at new housing development (new buildings for housing)	M			x	x	<ul style="list-style-type: none"> • Construction / workers camps provided with portable toilets/ and or septic tanks • Discharge construction/ workers camp sewage / wastewater into onsite septic tanks or connect to local public sewer system • Develop and Implement – Sludge Management and Disposal / Re-use Plan <ul style="list-style-type: none"> ○ Treated sludge to meet applicable discharge standards as set by TNPCB⁸ and / disposed at authorized landfill /disposed with municipal organic waste⁹ • Treated wastewater to meet effluent discharge standards; refer to Appendix 13 of the EARF. • Conduct effluent monitoring (at inlet and at outlet of STP) once a month • Conduct effluent monitoring at

⁸The STP shall be designed to meet the latest standards defined in Appendix 12.

⁹ Treated effluent and sludge shall be reuse as per guidelines of Central Public Health and Environmental Engineering Organization (CPHEEO), Appendix 13.

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								WWTP outlet once a month
5	Soil and Geology	Soil erosion; Pollution due to oil / lubricant / fuel spillage	M	Direct/Local / Reversible	x	x	X	<ul style="list-style-type: none"> Implement mitigation measures for potential environmental impacts on Topography as listed under “All Subproject Components” sub-heading
Waste Management¹⁰								
1	Topography (Land and Vegetation)	Waste generation (including construction & demolition debris / waste) and improper disposal	H	Direct/Local / Reversible	x	x	X	<ul style="list-style-type: none"> Develop and Implement - Waste Management Plan for construction stage and operation stage in consultation with ULBs / PWDs Construction stage: <ul style="list-style-type: none"> Provide multiple waste containers at construction / workers camps Transport of recyclables /scrap/ discarded equipment to identified depots Maximize the re-use of earth cut materials, spoils, and construction & demolition debris / waste to minimize waste disposal For unused construction &

¹⁰ The project will not support new construction of landfills.

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								<ul style="list-style-type: none"> ○ demolition debris / waste, contractors will collect, transport and dispose of debris / wastes at licensed dump facilities¹¹ and / or used for site reclamation or backfilling ○ Store all refuse and construction & demolition debris / waste generated on construction sites and construction staging areas away from water bodies / water sources / drainage and in designated areas and remove them from these locations for disposal to approved disposal sites or reuse regularly ○ Biodegradable waste such as cleared vegetation may be provided to local communities for use ○ Waste burning will be prohibited ● Operation stage:

¹¹TNSCB shall ensure that this condition is stipulated in the contractor bid document.

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								<ul style="list-style-type: none"> ○ Use of pre-defined areas within the new housing development for temporary safe repository of solid waste ○ Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas ○ Locate pre-defined areas away from new buildings for housing, at least 100 m ○ Ensure SWM area is lined with bunds to prevent liquid waste run-off; run-off to feed into onsite STP ○ Provide bovine permanent concrete trays for organic waste collection to be used for livestock feed; at least 100 m from new buildings for housing ○ Provide an open area for collection, airing, drying of manure; at least 100 m from new buildings for housing and/or stormwater

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								<p>drainage within new housing development</p> <ul style="list-style-type: none"> ○ No final waste disposal on site / off-site unless in approved landfills ○ Regularly monitor SWM area for pest incidences and reduce numbers if necessary
		Hazardous materials	H	Direct/Local / Reversible	x	x	x	<ul style="list-style-type: none"> ● Implement mitigation measures for potential environmental impacts on Hazardous materials as listed under "All Subproject Components" sub-heading ● Prohibit burning of solid / hazardous waste
2	Air Quality	Impact on air quality during general construction activities due to increase in dust emissions, vehicular emissions and during operation activities such as foul smell / odour	H	Direct/Local / Reversible		x	X	<ul style="list-style-type: none"> ● Implement mitigation measures for potential environmental impacts on Air Quality as listed under "All Subproject components" sub-heading; and the following: ● Dense plantation in the periphery of SWM site to avoid adverse impacts on aesthetics and reduce odor / foul smell
3	Noise	Noise / vibration due	H	Direct/Local / Reversible		x		<ul style="list-style-type: none"> ● Implement mitigation measures for potential environmental

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹	
					Design & Pre-construction	Construction	Operation		
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES									
		to general construction activities						impacts for Noise as listed under "All Subproject Components" sub-heading	
4	Surface and Ground Water Quality	Pollution due to runoff from general construction activities Siltation of water sources / water bodies due to spillage of construction debris / wastes Runoff from temporary solid waste disposal onsite	H	Direct/Local / Reversible		x	x	x	<ul style="list-style-type: none"> Implement mitigation measures for potential environmental impacts on Surface and Ground Water Quality as listed under "All Subproject Components" sub-heading
5	Soil and Geology	Soil erosion; Pollution due to oil / lubricant / fuel spillage	M	Direct/Local / Reversible		x	x	X	<ul style="list-style-type: none"> Implement mitigation measures for potential environmental impacts on Soil and Geology as listed under "All Subproject Components" sub-heading
Water Supply									
1	Topography (Land and Vegetation)	Lack of sufficient design and planning to ensure long term	L	Direct/Local / Reversible		x	x	x	<ul style="list-style-type: none"> Implement mitigation measures for potential environmental impacts on Topography as listed under "All Subproject Components" sub-heading; and the following:

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
		sustainability of subproject and protection of assets created						<p>Within New Housing Development</p> <ul style="list-style-type: none"> • Detailed design to integrate recommendations from geo-tech / topo investigations • All activities confined to work sites within new housing development; to be barricaded and enclosed • Water supply line works designed to blend in the environment • Minimize permanent and temporary land take for civil works • All temporary land-take resorted to pre-construction conditions • Develop and implement - <ul style="list-style-type: none"> ○ Site Restoration Plan (after completion of civil works) ○ New Housing Development Standard Operation & Maintenance Plan (during operation stage) • Regularly inspect and maintain water supply line, bulk valves, pump equipment for silt accumulation, obstruction, etc. <p>Outside new housing development</p> <ul style="list-style-type: none"> • Conduct detailed survey after

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								finalization of alignment from bulk water source to new housing development to access the feasibility of the alignment for need of any tree cutting, demolition of any structure, road and railway crossings, pipe laying in any private land, presence of any sensitive receptor along alignment, disturbance to public or business etc. <ul style="list-style-type: none"> Obtain prior consent from land owners (if pipe laying is required in private land) and No Objection Certificate (NOC) from concerned departments (for pipe laying in roads, road/railway crossings etc.,) prior to start of construction works, is required
		Hazard related to ground subsidence caused by excessive groundwater pumping	M	Direct/Local / Reversible	x	x	x	<ul style="list-style-type: none"> Bulk water to be drawn from existing water supply source In consultation with water supply regulatory authority, undertake environmental flow assessment to determine acceptable sustainable bulk water withdrawal rates for construction and operation stage at new housing development or water supply authority to furnish subproject specific commitment letter that

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								<p>relays the above or equivalent information</p> <ul style="list-style-type: none"> • Avoidance of groundwater abstraction • In case of groundwater abstraction from new borewells or new surface water source abstraction, develop and implement - Water Use Sustainability study / hydro-geological study specific to each subproject site¹²and at minimum to include estimation of sustainable yield, necessary modification to abstraction rates and/or locations to prevent adverse current and future impacts to downstream users or the relevant water agency to furnish subproject specific commitment letter that relays the above or equivalent information. • Groundwater abstraction to be undertaken in line with due permission obtained from the

¹² The water use sustainability / hydro-geological study for each new water source development is typically studied and monitored by the concerned water supply agency. The TNSCB will obtain a commitment letter and regulatory approvals from the relevant government agency / water supply agency affirming that any new water source development shall utilize water sources at sustainable levels of abstraction only (i.e. without significant reductions in the quantity or quality of the source overall), avoid polluted water sources, avoid water use conflicts by not abstracting water that is used for other purposes and ensure water quality provided complies with national drinking water standards at all times through regular monitoring. This requires identification of all users of the water source and that the water source can be appropriately recharged. Any subsequent water source sustainability study conducted should be incorporated into the relevant IEE and EMP.

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								relevant ground water authority prior to any subproject activity .
2	Air Quality	Impact on air quality during general construction activities due to increase in dust emissions, vehicular emissions	H	Direct/Local / Reversible	x	x		<ul style="list-style-type: none"> Implement mitigation measures for potential environmental impacts on Air Quality as listed under “All Subproject Components” sub-heading
3	Noise	Noise / vibration due to general construction and operation activities	H	Direct/Local / Reversible		x	X	<ul style="list-style-type: none"> Implement mitigation measures for potential environmental impacts for Noise as listed under “All Subproject Components” sub-heading; and the following: Deploy low noise pumps or other equipment with sound insulation including enclosing pumps with a sound proof structure. Pump station located at least 100 m from the nearest new building for housing
4	Surface and Ground Water Quality	Pollution due to runoff from general construction activities Siltation of water sources	H	Direct/Local / Reversible	x	x		Implement mitigation measures for potential environmental impacts on Surface and Ground Water Quality as listed under “All Subproject Components” sub-heading

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
		/ water bodies due to spillage of construction debris / wastes						
		Abstraction of water affecting downstream users / conflicts with other beneficial uses (groundwater / surface water)	H	Direct/Local / Reversible	x	X	x	<ul style="list-style-type: none"> • Bulk water to be drawn from existing water supply source • No water to be drawn from polluted sources or from a water source that is being used for other purposes to avoid water conflicts. • In consultation with water supply regulatory authority, undertake environmental flow assessment to determine acceptable bulk water withdrawal rates for construction and operation stage at new housing development or water supply authority to furnish subproject specific commitment letter that relays the above or equivalent information • Avoidance of groundwater abstraction • In case of groundwater abstraction from new borewells, develop and Implement - Water Use Sustainability study / hydro-geological study that is specific to each subproject site¹³ and will

¹³ The water use sustainability / hydro-geological study for each new water source development is typically studied and monitored by the concerned water supply agency. The TNSCB will obtain a commitment letter and regulatory approvals from the relevant government agency / water supply agency affirming that any

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								at minimum include estimation of sustainable yield, necessary modification to abstraction rates and/or locations to prevent adverse current and future impacts to downstream users or the relevant ground water agency to furnish subproject specific commitment letter that relays the above or equivalent information.
		Inadequate water supply or poor water quality for drinking and other household purposes	L	Direct/Local / Reversible	x	x	x	<ul style="list-style-type: none"> Groundwater abstraction to be undertaken in line with due permission obtained from the relevant authority prior to any subproject activity Provision of portable water and water for other uses at construction / workers camps Construction of adequate water supply infrastructure (temporary / permanent) to new housing development including distribution mains, bulk valves, and flow meters to supply portable water and water for

new water source development shall utilize water sources at sustainable levels of abstraction only (i.e. without significant reductions in the quantity or quality of the source overall), avoid polluted water sources, avoid water use conflicts by not abstracting water that is used for other purposes and ensure water quality provided complies with national drinking water standards at all times through regular monitoring. This requires identification of all users of the water source and that the water source can be appropriately recharged. Any subsequent water source sustainability study conducted should be incorporated into the relevant IEE and EMP.

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹	
					Design & Pre-construction	Construction	Operation		
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES									
								other household uses <ul style="list-style-type: none"> • Ensure municipal water supply complies with designated drinking water quality standards, refer to Section 2 of EARF • Ensure 'water for other household uses' meets applicable standards¹⁴ 	
5	Soil and Geology	Soil erosion; Pollution due to oil / lubricant / fuel spillage	M	Direct/Local / Reversible		x	x	x	<ul style="list-style-type: none"> • Implement mitigation measures for potential environmental impacts on Soil and Geology as listed under "All Subproject Components" sub-heading
Electricity Supply¹⁵									
1	Topography (Land and Vegetation)	Lack of sufficient design and planning to ensure long term sustainability of subproject and protection of assets created	L	Direct/Local / Reversible		x	x	x	<ul style="list-style-type: none"> • Implement mitigation measures for potential environmental impacts on Topography as listed under "All Subproject components" sub-heading; and the following: <p>Within new housing development</p> <ul style="list-style-type: none"> • All activities confined to work sites within new housing development i.e. erecting distribution poles, street lights,

¹⁴ In India, the Central Pollution Control Board has identified water quality requirements in terms of a few chemical characteristics, known as primary water quality criteria. Further, Bureau of Indian Standards has also recommended water quality parameters for different uses in the standard IS 2296:1992.

¹⁵ No new electricity generation source unless rooftop solar panels on new buildings for housing.

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								placement of step-down transformer, CNG/ LPG / D gensets ¹⁶ of appropriate capacity and stack height for dedicated supply to new buildings for housing and other uses, STP/WWTP operation, etc.); rooftop solar panels; <ul style="list-style-type: none"> • All works within barricaded and enclosed area • Minimize permanent and temporary land take for civil works • All temporary land-take resorted to pre-construction conditions • Develop and implement - <ul style="list-style-type: none"> ○ Site Restoration Plan (after completion of civil works) ○ New Housing Development Standard Operation & Maintenance Plan (during operation stage) • Regularly inspect and maintain electricity poles, e.g. conductors, maintenance of minimum sag, transformer, CNG / LPG / Diesel gensets, etc.

¹⁶ CNG = Compressed natural gas; LPG = Liquefied Petroleum Gas; D = Diesel.

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
								<p>Outside new housing development</p> <ul style="list-style-type: none"> • Conduct detailed survey after finalization of distribution line alignment (from tap off point from main line) to access the feasibility of the alignment for need of any tree cutting, maintaining distance from existing structures, PCRs, road and railway crossings, pole placement in any private land, presence of any sensitive receptor along alignment, disturbance to public or business etc. • Obtain prior consent from land owners (if erection of poles is required in private land) and NOC from concerned departments (for erecting pole along roads, road/railway crossings etc.), prior to start of construction works, is required
		Hazardous materials	H	Direct/Local / Reversible	X	x	x	<ul style="list-style-type: none"> • Implement mitigation measures for potential environmental impacts on Hazardous Materials as listed under "All Subproject Components" sub-heading • Ensure trained staff in receiving, handling and storage of LPG/ CNG and Diesel; to store in a shaded and enclosed area at least 100 m from the nearest new building for housing

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
2	Air Quality	Impact on air quality during general construction activities due to increase in dust emissions, operation of CNG / LPG / Diesel Gensets	H	Direct/Local / Reversible	X	x	x	<ul style="list-style-type: none"> Implement mitigation measures for potential environmental impacts on Air Quality as listed under "All Subproject Components" sub-heading; and the following: Ensure operation of CNG / LPG / Diesel gensets comply with the emissions standards prescribed by the CPCB; weblink: https://cpcb.nic.in/genset-notifications/
3	Noise	Noise / vibration due to general construction and operation activities	H	Direct/Local / Reversible		x	x	<ul style="list-style-type: none"> Implement mitigation measures for potential environmental impacts for Noise as listed under "All Subproject Components" sub-heading; and the following: Place CNG / LPG / Diesel gensets in an acoustic enclosure, other sound insulation CNG / LPG / Diesel genset located at least 100 m from the nearest new building for housing and ensure CNG / LPG / Diesel gensets comply with the noise standards prescribed by the CPSB, weblink: https://cpcb.nic.in/genset-notifications/
4	Surface and Ground Water	Pollution due to runoff from	H	Direct/Local / Reversible	x	x		<ul style="list-style-type: none"> Implement mitigation measures

S. No	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²	Nature of impact	Project Stage			Mitigation measures ¹
					Design & Pre-construction	Construction	Operation	
NEW HOUSING DEVELOPMENT (RESETTLEMENT SITE) AND SUPPORTING SERVICES								
	Quality	<p>general construction activities</p> <p>Siltation of water sources / water bodies due to spillage of construction debris/ wastes</p> <p>Pollution due to oil / lubricant / fuel spillage</p>						for potential environmental impacts on Surface and Ground Water Quality as listed under "All Subproject Components" sub-heading
5	Soil and Geology	Soil erosion; Pollution due to oil / lubricant / fuel spillage	M	Direct/Local/Reversible	x	x	x	<ul style="list-style-type: none"> Implement mitigation measures for potential environmental impacts on Soil and Geology as listed under "All Subproject components" sub-heading

Table A3.2. GENERAL ANTICIPATED ENVIRONMENTAL IMPACTS – DEMOLITION WORKS

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ¹⁸	Nature of impact	Project Stage			Mitigation measures ¹⁷
					Design & Pre- demolition	Demolition	Operation	
DEMOLITION WORKS¹⁹								
All selected encroachments for rehabilitation								
A. Physical Resources								
1	Topography (Land and Vegetation)	Potential adverse impact on sensitive receptors ²⁰	L	Direct/Local / Irreversible		x	x	<ul style="list-style-type: none"> • Demolition works to avoid sensitive receptors such as Physical Cultural Resources (PCRs) and will exclude: <ul style="list-style-type: none"> ○ Religious structures e.g., chapels, temples, mosques, etc. and if cannot exclude, then the religious structures in consultation with the relevant local stakeholders

¹⁷In their bids, all contractors will be required to respond to the subproject specific IEE and EMP requirements, which shall take reference of the mitigation measures described in these Tables A3.1, A3.2 and A3.3 at a minimum. All contractors will be required to prepare a site-specific Demolition Environmental Management Plan (D-EMP) including sub-plans as described in Table A3.2. These plans will be prepared under the supervision of the TNSCB PIDs and in consultation and support of Urban Local Bodies (ULBs), Public Works Departments (PWDs) as required. The plans will be reviewed and cleared by TNSCB PMU prior to any subproject activity. Each contractor will be required to assign a person responsible for environment, health and safety (Contractor-EHS) and grievance redress mechanism (Contractor-GRM) as well as for Asbestos Containing Materials (Contractor-ACM).

¹⁸With Category A excluded, the magnitude of impacts is predictable and will be relatively low for all subprojects; however to maintain the integrity of the assessment process, the "Potential Impact" has been categorised as Low, Medium, High (L/M/H) while nature of impact is described as Direct / Indirect, Local/Regional, Reversible / Irreversible.

¹⁹The works will include a) Demolition works - of existing encroachments, clearance and fencing.

²⁰"Receptor": the resource (human / natural environment / economic / social) that is potentially going to receive and have to cope with an impact; "Sensitivity": ability to cope with an impact and/or its importance to India. It is generally accepted that human health is always a high sensitivity receptor, however in terms of environmental/natural resources, the sensitivity varies according to the receptor e.g. scrubland with no significant biodiversity is considered less sensitive than a water body which may support aquatic ecosystems, local biodiversity and/or livelihoods through fishing or marine tourism. "Magnitude": the size of the potential impact. Impacts may be short term and considered low magnitude (e.g. noise, dust or vibration) or high magnitude and long term (e.g. global impacts due to the project).

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ¹⁸	Nature of impact	Project Stage			Mitigation measures ¹⁷
					Design & Pre-demolition	Demolition	Operation	
DEMOLITION WORKS ¹⁹								
								<ul style="list-style-type: none"> ○ Avoid cutting trees
		Lack of sufficient design and planning to ensure long term sustainability of subproject and protection of assets created	L	Direct/Local / Irreversible		x	x	<ul style="list-style-type: none"> ● Undertake a detailed walk over survey prior to any subproject activity: <ul style="list-style-type: none"> ○ Delineating and mapping of catchment areas of encroached water bodies / areas vulnerable to flooding hazards ○ Delineating and mapping Right of Way (ROW) for water canals / channels ○ Delineating and mapping fencing lines / perimeters ○ Ascertaining the location of any Asbestos Containing Materials (ACM) prior to any demolition activity on all site maps and in GIS system; activity undertaken by ACM expert (refer to details below) ○ Conducting situation analysis in the subproject area of influence for current solid waste and hazardous waste disposal, collection and transport, sewerage discharge, drainage, structural integrity of

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ¹⁸	Nature of impact	Project Stage			Mitigation measures ¹⁷
					Design & Pre-demolition	Demolition	Operation	
DEMOLITION WORKS ¹⁹								
								nearby building that may be affected by vibration during demolition works, etc.
		Change in the natural physical features and current aesthetics due to demolition works	H	Direct/Local / Reversible	x	x	x	<ul style="list-style-type: none"> Demolition works strictly restricted to the works sites Regeneration works to take place at the end of demolition works as per Table A3.3
		Stockpiling of demolition debris / waste	H	Direct/Local / Reversible		x		<ul style="list-style-type: none"> Temporary storage of demolition debris / waste (concrete rubble, etc.) confined to work sites, such as there is no obstruction to natural drainage pattern at site Debris / waste stockpile covered to reduce dust generation
		Spoils re-use / disposal	H	Direct/Local / Reversible		x	x	<ul style="list-style-type: none"> Maximize the re-use spoils if any as much as possible for backfilling and site reclamation Spoils disposal sites identified and utilized as per pre-approved sites and plans from the ULBs / PWDs Temporary storage to be located within demolition sites and at least 100 m from existing residential areas to reduce dust emissions Vehicles covered during transportation to avoid spillage Develop and Implement – <ul style="list-style-type: none"> Spoils Re-use / Disposal

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ¹⁸	Nature of impact	Project Stage			Mitigation measures ¹⁷
					Design & Pre-demolition	Demolition	Operation	
DEMOLITION WORKS ¹⁹								
								Plan
		Waste generation (including demolition debris/ waste) and improper disposal	H	Direct/Local / Reversible		x	x	<ul style="list-style-type: none"> • Develop and Implement - Waste Management Plan for demolition works in consultation with ULBs / PWDs • Demolition stage: <ul style="list-style-type: none"> ○ Transport of recyclables /scrap/ discarded equipment either to identified depots or to be handed over to subproject beneficiaries for use or re-sale ○ Store all refuse and construction & demolition debris / waste generated on demolition sites away from water bodies / water sources / drainage and in designated areas and remove them from these locations for disposal to approved disposal sites or re-use for backfilling / site reclamation ○ Maximize the re-use of spoils, construction & demolition debris / wastes to minimize waste disposal ○ For construction & demolition debris / waste, the contractor(s) will

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ¹⁸	Nature of impact	Project Stage			Mitigation measures ¹⁷
					Design & Pre-demolition	Demolition	Operation	
DEMOLITION WORKS ¹⁹								
								collect, transport and dispose of wastes at licensed dump facilities that should be clearly identified prior to start of any works ²¹ <ul style="list-style-type: none"> ○ Biodegradable waste such as cleared vegetation may be provided to local communities for use ○ Waste burning will be prohibited ○ No final waste disposal on site / off-site unless in approved disposal facilities / landfills
		Hazardous waste materials	H	Direct/Local / Reversible	x	x		<ul style="list-style-type: none"> • Temporary secured area set up for handling hazardous and polluting materials e.g. polychlorinated biphenyl-free (PCB) in discarded electrical wiring • Licensed vendors/ companies to collect transport and dispose used / unused hazardous materials / hazardous wastes in approved disposal facilities • Develop and Implement – <ul style="list-style-type: none"> ○ Hazardous Materials Control Plan (including hazardous waste)

²¹ TNSCB shall ensure that this condition is stipulated in the contractor bid document.

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ¹⁸	Nature of impact	Project Stage			Mitigation measures ¹⁷
					Design & Pre-demolition	Demolition	Operation	
DEMOLITION WORKS ¹⁹								
		Asbestos containing materials (ACM)	H			x	x	<ul style="list-style-type: none"> • Hire an Asbestos Expert to undertake training of all workers / contractors as well as PMU, PIDs in identifying existing ACM and on Occupational Environment, Health and Safety related to potential hazardous material exposure (refer to TOR included as Appendix 11 of EARF) • Conduct detailed walk over survey by ACM expert to ascertain the location of any ACM prior to any demolition activity • Demolition works conducted to avoid disturbing any ACM • Support contractor assigned person (Contractor -ACM) in conducting site assessment (across selected encroachments), developing inventory of existing ACM including tagging and marking locations of existing ACM in all site maps and GIS system • Develop ACM management plan /protocol for compliance with asbestos policies of major international agencies²² and /or

²² In the USA, standards and approaches for handling asbestos are prescribed by the Occupational Health and Safety Administration (OHSA) and the Environmental Protection Agency (EPA) and can be found at <http://www.osha.gov/SLTC/asbestos>

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ¹⁸	Nature of impact	Project Stage			Mitigation measures ¹⁷
					Design & Pre-demolition	Demolition	Operation	
DEMOLITION WORKS ¹⁹								
								national requirements <ul style="list-style-type: none"> • Submission of site assessment, inventory, and ACM management plan to TNSCB PMU for review and approval • Contractor-ACM to carry out general awareness campaigns on ACM exposure for field staff and community • Conduct training of workers on ACM during orientation / induction
2	Physical Cultural Resources (PCRs)	Potential impact on archaeological, historical or cultural important sites	L	Direct/Local / Reversible		x	x	<ul style="list-style-type: none"> • Detailed walk over survey / and buffer selection to avoid PCRs • Establish 'Chance Find Procedures' • Consult with local Archaeology Survey of India (ASI) office if any demolition activities in close proximity to World Heritage Sites, Local Heritage Sites, etc., and obtain prior permission (requires prior permission of ASI for undertaking works within 100-300 m of the boundary of the protected/heritage monuments) • If required, develop and implement Heritage Impact Assessment and Management Plan in close consultation and support of ASI • Conduct training of workers on PCRs and Chance Find Procedures during orientation / induction

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ¹⁸	Nature of impact	Project Stage			Mitigation measures ¹⁷
					Design & Pre-demolition	Demolition	Operation	
DEMOLITION WORKS ¹⁹								
B. Environmental Resources								
1	Air Quality	Impact on air quality during demolition activities due to increase in dust emissions and vehicular movement	H	Direct/Local / Reversible		x	x	<ul style="list-style-type: none"> • Work sites to be enclosed / barricaded • Structures to be demolished should be wetted through water sprinkling to reduce dust • Air quality monitoring once before the start of demolition works to establish the baseline; and once after completion of the demolition work • Periodic watering at demolition sites e.g. at exposed dust prone demolition debris / waste/ stockpiles until final disposal • Vehicles with an open load-carrying case, which transport potentially dust-producing demolition debris/ waste materials / stockpiles, shall have proper fitting sides and tail boards. Dust-prone materials shall not be loaded to a level higher than the side and tail boards, and shall always be covered with a strong tarpaulin • Use of Personal Protective Equipment (PPE); refer to details under Occupational Environment, Health and Safety
2	Noise	Noise/ vibration due to general	H			x	x	<ul style="list-style-type: none"> • Conduct situation analysis in the subproject area of influence for checking structural integrity of

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ¹⁸	Nature of impact	Project Stage			Mitigation measures ¹⁷	
					Design & Pre-demolition	Demolition	Operation		
DEMOLITION WORKS ¹⁹									
		demolition activities and vehicular movement						<p>nearby building that may be affected by vibration during demolition works, etc.</p> <ul style="list-style-type: none"> • Noise level measurements once before the start of the demolition works to establish the baseline; and once after completion of the demolition works • Proper maintenance of vehicles / equipment/ machineries so that the ambient noise standards are met; also refer to Section 2 of the EARF • No demolition works at night time; restrictions on the movement of heavy vehicles • Use of Personal Protective Equipment (PPE) like ear plugs, mufflers etc.; refer to details under Occupational Environment, Health and Safety • Develop and implement <ul style="list-style-type: none"> ○ Noise and Dust Control Plan 	
3	Surface and Ground Water Quality	<p>Pollution due to runoff from general demolition activities</p> <p>Siltation of water sources / water bodies due to spillage</p>	H	Direct/Local / Reversible		x	x	x	<ul style="list-style-type: none"> • No anticipated impact on ground water quality • Stockpiles of demolition debris, waste, materials, etc., located away from water bodies / water sources / drainage leading to water bodies / water sources • No disposal of demolition debris, wastes, etc., into water bodies /

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ¹⁸	Nature of impact	Project Stage			Mitigation measures ¹⁷	
					Design & Pre-demolition	Demolition	Operation		
DEMOLITION WORKS ¹⁹									
		of demolition debris / wastes						<p>water sources / drainage in and around the work sites</p> <ul style="list-style-type: none"> Note: water quality monitoring will be conducted prior to start of Regeneration works, refer to details in Table A3.3 	
		Pollution due to oil / lubricant / fuel spillage	M	Direct/Local / Reversible		x	x	<ul style="list-style-type: none"> Temporary secured area set up for storage and handling of hazardous and polluting materials with a containment tray or provided with bunds Develop and implement – Spill Response Plan <ul style="list-style-type: none"> Provide with cleanup kits Keep a stock of absorbent materials (e.g. sand, earth or commercial products) on site to deal with spillages and train staff in their use Final disposal at an approved waste disposal facility If refueling in the field is required, it shall be done from road-licensed fuel trucks away from water bodies / water sources / drainage and/or other sensitive natural receptors 	
4	Soil and Geology	Soil erosion	M	Direct/Local / Reversible			x	x	<ul style="list-style-type: none"> After demolition works, conduct proper land leveling, backfilling, and grading for stabilization, and permanent stabilization measures at the end of demolition works

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ¹⁸	Nature of impact	Project Stage			Mitigation measures ¹⁷	
					Design & Pre-demolition	Demolition	Operation		
DEMOLITION WORKS¹⁹									
								<ul style="list-style-type: none"> • Close attention to drainage provision; maintain natural drainage patterns • Restore vegetation cover on any backfilled areas to prevent soil erosion • Note: the site will be restored via Regeneration Works of demolished sites, refer to details in Table A3.3. 	
		Pollution due to oil / lubricant / fuel spillage	M	Direct/Local / Reversible		x	x	<ul style="list-style-type: none"> • Temporary secured area set up for storage and handling of hazardous and polluting materials with a containment tray or provided with bunds • Develop and implement – Spill Response Plan • If refueling in the field is required, it shall be done from road-licensed fuel trucks away from water bodies / water sources / drainage and/or other sensitive natural receptors 	
C. Ecological Resources									
1	Terrestrial Ecology	Loss of ecology	L	Direct/Local / Irreversible		x	x	x	<ul style="list-style-type: none"> • Avoidance of tree cutting at existing encroachments / demolition sites • Develop and implement - Regeneration Works Standard Operation and Maintenance Plan (SOMP) (also see Table A3.3)
2	Terrestrial Fauna	Species vulnerability to	L	Direct/Local /		x			<ul style="list-style-type: none"> • None expected since existing

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ¹⁸	Nature of impact	Project Stage			Mitigation measures ¹⁷
					Design & Pre-demolition	Demolition	Operation	
DEMOLITION WORKS¹⁹								
		anticipated change in habitat		Irreversible				encroachments are located in urban and peri-urban areas with access to economic services / activities
3	Avifauna	Disturbance to the local avifauna	L	Direct/Local / Irreversible		x		<ul style="list-style-type: none"> None expected since existing encroachments are located in urban and peri-urban areas with access to economic services / activities
4	Aquatic Ecology	Disturbance to the local aquatic ecology	L	Direct/Local / Irreversible		x		<ul style="list-style-type: none"> Stockpiles of debris, waste, materials, etc., located away from water bodies / water sources / drainage leading to water bodies or water sources No disposal of demolition debris, wastes into water bodies / water sources / drainage in and around the work sites
D. Human Environment								
1	Occupational Health and Safety	Exposure to hazards for workers working on demolition works	H	Direct/Local / Reversible		x	x	<ul style="list-style-type: none"> Develop and implement – Occupational Environment, Health and Safety (EHS) Plan and Emergency Response Plan (ERPs) at work sites <ul style="list-style-type: none"> E.g. IFC (WB) EHS Guidelines on occupational health and safety; Good Practice Note – Asbestos Occupational and

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ¹⁸	Nature of impact	Project Stage			Mitigation measures ¹⁷
					Design & Pre-demolition	Demolition	Operation	
DEMOLITION WORKS ¹⁹								
								<p>Community Health Issues²³</p> <ul style="list-style-type: none"> ○ Strictly enforce the use of PPE during demolition works such as goggles, gloves, noise reducing mufflers, and respirators to workers to minimize inhalation of fumes and dust • Create awareness of health & safety risks of transmittable diseases (HIV/AIDs / COVID-19), child labor, bonded labor or forced labor
		Fires, explosion and other accidents	H	Direct / Local / Irreversible		x		<ul style="list-style-type: none"> • Strictly enforce the use of PPE during demolition works • Implement Occupational EHS Plan and ERP • Regular inspection of equipment / machineries for faults • Log accidents
2	Community Health and Safety	Excessive disturbance to communities due to demolition works	H	Direct/Local / Reversible		x	x	<ul style="list-style-type: none"> • Meaningful consultations with communities to keep them informed of anticipated activities, in particular those that may result in disruption of access, utilities, noisy or dust-generating activities that are likely to result in significant disturbance

²³<https://siteresources.worldbank.org/EXTPOPS/Resources/AsbestosGuidanceNoteFinal.pdf>

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ¹⁸	Nature of impact	Project Stage			Mitigation measures ¹⁷
					Design & Pre-demolition	Demolition	Operation	
DEMOLITION WORKS ¹⁹								
								<ul style="list-style-type: none"> • Identify and adhere to strict demolition schedule, avoid prolonged demolition and disturbance • Ensure alternative access is provided for community facilities. • Liaise with schools that are in close proximity to demolition sites on examination periods and scale down activities during such periods if necessary • Ensure communities are aware of Grievance Redress Mechanism (GRM) entry points • Create awareness of health & safety risks of transmittable diseases (HIV/AIDs / COVID-19), child labor, bonded labor or forced labor • Develop and implement – <ul style="list-style-type: none"> ○ Community Health and Safety Plan
		Temporary traffic management	M	Direct/Local / Reversible	x	x		<ul style="list-style-type: none"> • Develop and implement - Traffic Control Plan together with the local traffic police prior to any demolition activities • Proper traffic signs at the demolition sites with information on nature and duration of work for public safety • Schedule transport routes and activities during non-peak hours; in case of lane closures, deploy

S . N o	Environmenta l Parameter	Potential Environmental Impacts	Level of Impact L/M/H ¹⁸	Nature of impact	Project Stage			Mitigation measures ¹⁷
					Design & Pre- demolition	Demolition	Operatio n	
DEMOLITION WORKS ¹⁹								
								workers to direct traffic
		Access to demolition sites	M	Direct/Local / Reversible			x	<ul style="list-style-type: none"> Erect signs and barricades Make all sites secure, and discourage access by members of the public through appropriate barricades, signage and/or security personnel, as appropriate Ensure alternative access is provided for community facilities
		Utility services interruptions	H	Direct/Local / Reversible		x	x	<ul style="list-style-type: none"> Assess demolition sites in advance and identify potential for disruption to services and risks before commencing demolition activities Any damage or hindrance/disadvantage to local businesses caused by the premature removal or insufficient replacement of public utilities is subject to full compensation, at the full liability of the contractor who caused the problem If temporary disruption is unavoidable, develop a plan in collaboration with relevant local authorities such as power company, water supply company and communication company to minimize the disruption and communicate the dates and duration in advance to affected communities / persons
		Information	H	Direct/Local		x	x	<ul style="list-style-type: none"> Conduct meaningful consultations

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ¹⁸	Nature of impact	Project Stage			Mitigation measures ¹⁷
					Design & Pre-demolition	Demolition	Operation	
DEMOLITION WORKS ¹⁹								
		disclosure						<p>to inform subproject affected persons / beneficiaries, nearby residents and businesses in advance of the demolition activities, give the dates and duration of expected disruption and make aware of the subproject GRM entry points</p> <ul style="list-style-type: none"> • Erect billboards, which include schedule, responsible person and complaint phone number, at the entry to each demolition site • Place clear signs at demolition sites in view of the public, warning people of potential dangers such as moving vehicles, hazardous materials, demolition schedule, etc. and raising awareness on safety issues
4	Socio-economics	Beneficial impacts / job opportunities Influx of migrant workers	H	Direct/ Regional		X		<ul style="list-style-type: none"> • Hiring for temporary jobs / emphasis to local hiring to avoid social conflicts

Table A4.3. GENERAL ANTICIPATED ENVIRONMENTAL IMPACTS – REGENERATION WORKS

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²⁵	Nature of impact	Project Stage			Minimum Mitigation measures ²⁴
					Design & Pre- regeneratio n	Regenerati on works	Operatio n	
RE-GENERATION WORKS ²⁶								
All selected encroachments after completion of demolition works.								
A. Physical Resources								
1	Climate Risks	Subproject vulnerability due to climate risks	M	Indirect/ Irreversibl e	x	X	x	<ul style="list-style-type: none"> • Specifications for use of materials with the lowest embedded Greenhouse gases (GHG) • Specify local materials from licensed and /or local providers that minimize transport distance for re-generation works. • Specify materials that are recycled, have recycled content or are from sustainable sources
2	Topograph y (Land and Vegetation	Potential impact on sensitive receptors ²⁷	L	Direct/Loc al/ Irreversibl e	x	X	x	<ul style="list-style-type: none"> • Regeneration works to include preservation of Physical Cultural Resources (PCRs)

²⁴All Contractors in close coordination with the TNSCB PMU and PIDs will be responsible for developing and implementing a site-specific Regeneration Works Environmental Management Plan (R-EMP) including sub-plans as described in Table A3.3; this will be done in consultation and with support of the ULBs /PWDs.

²⁵ With Category A excluded, the magnitude of impacts is predictable and will be relatively low for all subprojects; still to maintain the integrity of the assessment process, the "Potential Impact" has been categorised as Low, Medium, High (L.M/H) while nature of impact is described as Direct / Indirect, Local/Regional, Reversible / Irreversible.

²⁶ The works will include a) Regeneration works - will include at minimum re-greening/re-vegetation of banks along water bodies and channels, clearing and preventing new solid waste disposal and/or sewage disposal in water bodies and channels.

²⁷"Receptor": the resource (human / natural environment / economic / social) that is potentially going to receive and have to cope with an impact; "Sensitivity": ability to cope with an impact and/or its importance to India. It is generally accepted that human health is always a high sensitivity receptor, however in terms of environmental/natural resources, the sensitivity varies according to the receptor e.g., scrubland with no significant biodiversity is considered less sensitive than a water body which may support aquatic ecosystems, local biodiversity and/or livelihoods through fishing or marine tourism. "Magnitude": the size of the potential impact. Impacts may be short term and considered low magnitude (e.g., noise, dust or vibration) or high magnitude and long term (e.g. global impacts due to the project).

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²⁵	Nature of impact	Project Stage			Minimum Mitigation measures ²⁴
					Design & Pre- regeneratio n	Regenerati on works	Operatio n	
RE-GENERATION WORKS ²⁶								
)							<ul style="list-style-type: none"> • Trees to be retained
		Lack of sufficient design and planning to ensure long term sustainability of subproject and protection of assets created	L	Direct/Local/Irreversible	x	x	x	<ul style="list-style-type: none"> • Undertake a detailed walk over survey prior to any subproject activity: <ul style="list-style-type: none"> ○ Conducting situation analysis in the subproject area of influence for current solid waste disposal, sewerage, drainage, etc. (also included in Table 3.2). ○ Based on outcome of situational analysis, develop – site specific plans in close coordination with ULBs / PWDs e.g., waste management plan, sewerage collection and management plan • Develop and Implement - Regeneration Works Standard Operation & Maintenance Plan (SOMP), including at minimum: <ul style="list-style-type: none"> ○ Re-greening / re-vegetation of banks / land along water bodies and channels ○ New plantations with native species ○ Implement – site specific plans in close coordination with ULBs / PWDs e.g., waste management plan, sewerage collection and management plan, etc. • Regeneration works to commence at the end of demolition works to prevent further

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²⁵	Nature of impact	Project Stage			Minimum Mitigation measures ²⁴
					Design & Pre- regeneratio n	Regenerati on works	Operatio n	
RE-GENERATION WORKS ²⁶								
								encroachments
		Change in the natural physical features and current aesthetics due to regeneration works	H	Direct/Local/ Reversible	x	x	x	<ul style="list-style-type: none"> Minimize temporary land take for regeneration works All temporary land-take resorted to original conditions Develop and Implement - Regeneration Works Standard Operation & Maintenance Plan (SOMP) Regeneration works to commence at the end of demolition works to prevent further encroachments
		Stockpiling of materials	M	Direct/Local/ Reversible		x		<ul style="list-style-type: none"> Storage of materials for regeneration works confined to work sites, such as there is no obstruction to natural drainage pattern at site; covered to reduce dust generation
		Spoils re-use / disposal	L	Direct/Local/ Reversible	x	x		<ul style="list-style-type: none"> Maximize the re-use of spoils and demolition debris / wastes to minimize waste disposal Spoils disposal sites identified and utilized as per pre-approved plans from the relevant authority To be located within work sites and at least 100 m from existing residential areas and/or water bodies / water sources Vehicles covered during transportation to avoid spillage Develop and implement – <ul style="list-style-type: none"> Spoils Re-use / Disposal Plan
		Sources of	H	Direct/Loc	x	x		<ul style="list-style-type: none"> Maximize the re-use of spoils, demolition

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²⁵	Nature of impact	Project Stage			Minimum Mitigation measures ²⁴	
					Design & Pre- regeneratio n	Regenerati on works	Operatio n		
RE-GENERATION WORKS ²⁶									
		materials		al/ Reversibl e				debris / wastes <ul style="list-style-type: none"> Specify materials that are recycled, have recycled content or are from sustainable sources In case required, use sources licensed by the relevant authorities if the re-use options are not feasible 	
		Waste generation (including construction and demolition waste)	L			x	x	x	<ul style="list-style-type: none"> Implement site specific Waste Management Plan in close coordination with ULBs / PWDs as part of SOMP Provide waste containers for public use at regenerated sites Collaborate with ULBs/ PWDs for collection and disposal No final waste disposal on site / off-site unless in approved landfills Regularly monitor regenerated area
B. Environmental Resources									
1	Air Quality	Impact on air quality during general regeneration work activities due to increase in dust emissions and /or vehicular movement	H	Direct/Loc al/ Reversibl e		x	x		<ul style="list-style-type: none"> Re-generation sites to be enclosed / barricaded during works Periodic watering at works sites, work staging areas, unpaved areas, exposed dust prone stockpiles Store dust-prone materials in areas with shelters on four sides and on top. If such materials have to be stored in open area, cover with strong tarpaulin Vehicles with an open load-carrying case, which transport potentially dust-producing materials, shall have proper fitting sides

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²⁵	Nature of impact	Project Stage			Minimum Mitigation measures ²⁴	
					Design & Pre- regeneratio n	Regenerati on works	Operatio n		
RE-GENERATION WORKS ²⁶									
								and tail boards. Dust-prone materials shall not be loaded to a level higher than the side and tail boards, and shall always be covered with a strong tarpaulin	
2	Noise	Noise/ vibration due to general regeneration work activities and /or vehicular movement	H			x	x	<ul style="list-style-type: none"> • Proper maintenance of vehicles / equipment/ machineries so that the ambient noise standards are met; refer to Section 2 of EARF • Restriction of noise generating activities at night • Use of Personal Protective Equipment (PPE) like ear plugs, mufflers etc. 	
3	Surface and Ground Water Quality	Pollution due to runoff from general regeneration work activities Siltation of water sources / water bodies due to spillage of wastes	L	Direct/Loc al/ Reversibl e		x	x	x	<ul style="list-style-type: none"> • No anticipated impact on ground water quality • Surface quality monitoring once before start of regeneration works to establish the baseline; once during regeneration works and once after completion of regeneration works²⁸ • Construction / workers camps (portable toilets, stockpiles of materials, etc.) located away from water bodies / water sources / drainage leading to water bodies or water sources • No disposal of wastes into water bodies / water sources / drainage • Install and operate temporary silt traps along existing drainage (if any) on work sites to treat and process water and muddy

²⁸ Mitigation of water quality impact during regeneration works shall be based on site specific water quality monitoring results conducted once before start of regeneration works to establish baseline.

S . N o	Environmental Parameter	Potential Environment al Impacts	Level of Impact L/M/H ²⁵	Nature of impact	Project Stage			Minimum Mitigation measures ²⁴	
					Design & Pre- regeneratio n	Regenerati on works	Operatio n		
RE-GENERATION WORKS ²⁶									
								<p>runoff with high concentrations of suspended solids prior to final discharge</p> <ul style="list-style-type: none"> • No vehicle / equipment / machinery maintenance activity close to water bodies / water sources / drainage 	
		Pollution due to oil / lubricant / fuel spillage	L	Direct/Local/ Reversible		x	x	<ul style="list-style-type: none"> • Temporary secured area set up for storage and handling of hazardous and polluting materials with a containment tray or provided with bunds • Develop and implement – Spill Response Plan <ul style="list-style-type: none"> ○ Provide with cleanup kits ○ Keep a stock of absorbent materials (e.g. sand, earth or commercial products) on site to deal with spillages and train staff in their use ○ Protocol for immediate action utilizing absorbents (final disposal at an approved waste disposal facility) • If refueling in the field is required, it shall be done from road-licensed fuel trucks away from water bodies / water sources / drainage 	
4	Soil and Geology	Soil erosion	L	Direct/Local/ Reversible		x	x	X	<ul style="list-style-type: none"> • Proper land leveling and grading for stabilization and other erosion-prone working areas, and permanent stabilization measures at the end of demolition period / start of regeneration works • Close attention to drainage provision; maintain natural drainage patterns

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²⁵	Nature of impact	Project Stage			Minimum Mitigation measures ²⁴	
					Design & Pre- regeneratio n	Regenerati on works	Operatio n		
RE-GENERATION WORKS ²⁶									
								<ul style="list-style-type: none"> Restore vegetation cover to prevent soil erosion; If restoration is carried out during periods of hot or extreme weather, ensure adequate aftercare to maximize survival 	
		Pollution due to oil / lubricant / fuel spillage	L	Direct/Local/ Reversible		x	x	<ul style="list-style-type: none"> Temporary secured area set up for storage and handling of hazardous and polluting materials with a containment tray or provided with bunds Develop and implement – Spill Response Plan If refueling in the field is required, it shall be done from road-licensed fuel trucks away from water bodies / water sources / drainage and/or other sensitive natural receptors 	
A. Ecological Resources									
1	Terrestrial Ecology	Loss of ecology	L	Direct/Local/ Irreversible		x	x	X	<ul style="list-style-type: none"> Avoidance of tree cutting (at demolition sites / regeneration sites) No use of chemicals (pesticides / herbicides) Positive impact anticipated after regeneration of cleared water bodies / channels and surrounding land areas Develop and implement – Regeneration Works Standard Operation & Maintenance Plan (SOMP)
2	Terrestrial Fauna	Species vulnerability to anticipated change in habitat	L	Direct/Local/ Irreversible		x			<ul style="list-style-type: none"> None expected since regeneration works will take place after demolition of existing encroachments that are located in urban and peri-urban areas with access to

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²⁵	Nature of impact	Project Stage			Minimum Mitigation measures ²⁴
					Design & Pre- regeneratio n	Regenerati on works	Operatio n	
RE-GENERATION WORKS ²⁶								
								economic services / activities
3	Avifauna	Disturbance to the local avifauna	L	Direct/Loc al/ Irreversibl e			X	<ul style="list-style-type: none"> Positive impact anticipated after regeneration of cleared water bodies / channels and surrounding areas /land
4	Aquatic Ecology	Not anticipated	L	Direct/Loc al/ Irreversibl e		x	X	<ul style="list-style-type: none"> Store all refuse and waste generated during regeneration works away from water bodies / water sources / drainage and in designated areas and remove them from these locations for disposal to approved disposal facilities or re-cycle and re-use Positive impact anticipated after regeneration of water bodies / channels
D. Human Environment								
1	Occupatio nal Health and Safety	Exposure to hazards for workers working on asphalt mixing, concrete mixing, cement, etc.	M	Direct/Loc al/ Continuou s		x	x	<ul style="list-style-type: none"> Develop and implement – Occupational Environment, Health and Safety (EHS) Plan and Emergency Response Plan (ERPs) at work sites <ul style="list-style-type: none"> E.g. IFC (WB) EHS Guidelines on Occupational Environment, Health and Safety Strictly enforce the use of PPE during works such as goggles, gloves, noise reducing mufflers to workers to minimize inhalation of fumes and dust, head-lamps, high visibility vests, stand-alone outdoor lighting, etc. Create awareness of health & safety risks

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²⁵	Nature of impact	Project Stage			Minimum Mitigation measures ²⁴
					Design & Pre- regeneratio n	Regenerati on works	Operatio n	
RE-GENERATION WORKS ²⁶								
								of transmittable diseases (HIV/AIDs / COVID-19), child labor, bonded labor or forced labor
		Provision of workers camp / accommodation	H	Direct/Local/ Reversible		x		<ul style="list-style-type: none"> • Provide adequate workers accommodation in line with IFC (WBG) guidelines²⁹
		Unhygienic conditions at workers camp / accommodation	H	Direct/Local/ Reversible		x		<ul style="list-style-type: none"> • Provide water and sanitation facilities (situated separately for men and women); regular cleaning and disinfection of site • Provide adequate electricity / lighting • Provide portable water / storage tanks • Conduct regular health checkup / provide access to medical care • Provide solid waste bins and collection; no final disposal on-site • Discharge construction / workers camp sewage / wastewater into onsite septic tanks or connect to local public sewer system
2	Community Health and Safety	Excessive disturbance to communities due to prolonged construction	L	Direct/Local/ Reversible		x	x	<ul style="list-style-type: none"> • Meaningful consultations with communities to keep them informed of anticipated activities, in particular those that may result in disruption of access, utilities, noisy or dust-generating activities that are likely to result in significant disturbance • Identify and adhere to strict work schedule

²⁹[IFC Guidance Note on Workers Accommodation](#)

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²⁵	Nature of impact	Project Stage			Minimum Mitigation measures ²⁴
					Design & Pre- regeneratio n	Regenerati on works	Operatio n	
RE-GENERATION WORKS ²⁶								
								<ul style="list-style-type: none"> • Restriction of all night time activities • Liaise with schools that are in close proximity to work sites on school examination periods and scale down work activities during such periods, if necessary, to reduce disturbance • Ensure communities are aware of Grievance Redress Mechanism (GRM) entry points • Create awareness of health & safety risks of transmittable diseases (HIV/AIDs / COVID-19), child labor, bonded labor or forced labor • Develop and implement – <ul style="list-style-type: none"> ○ Community Health and Safety Plan
		Temporary traffic management	M	Direct/Local/Reversible		x	x	<ul style="list-style-type: none"> • Develop and implement - Traffic Control Plan together with the local traffic police prior to any regeneration activities • Proper traffic signs at the work sites with information on nature and duration of work for public safety • Schedule transport routes and activities during non-peak hours; in case of lane closures, deploy workers to direct traffic • Erect speed limit signs of 8 km/h on all unpaved approach roads and unpaved work sites as a means of controlling fugitive dust emission in unpaved areas
		Access to work sites	M	Direct/Local/Reversible			x	<ul style="list-style-type: none"> • Make all sites secure and discourage access by members of the public through appropriate fencing, signage and/or

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²⁵	Nature of impact	Project Stage			Minimum Mitigation measures ²⁴
					Design & Pre- regeneratio n	Regenerati on works	Operatio n	
RE-GENERATION WORKS ²⁶								
				e				security personnel, as appropriate during regeneration works <ul style="list-style-type: none"> • Ensure alternative access is provided for community facilities
		Utility services interruptions	L	Direct/Loc al/ Reversibl e	x	x		<ul style="list-style-type: none"> • Assess sites in advance and identify potential for disruption to services and risks before starting of any activities • Any damage or hindrance/disadvantage to local businesses caused by the premature removal or insufficient replacement of public utilities is subject to full compensation, at the full liability of the contractor who caused the problem • If temporary disruption is unavoidable, develop a plan in collaboration with relevant local authorities such as power company, water supply company and communication company to minimize the disruption and communicate the dates and duration in advance to affected communities / persons
		Information disclosure	H	Direct/Loc al	x	x		<ul style="list-style-type: none"> • Conduct meaningful consultations to inform nearby residents and businesses in advance of the work activities, given the dates and duration of expected disruption and make aware of the subproject GRM entry points • Erect billboards, which include work contents, schedule, responsible person and complaint phone number, at the entry to each work site and/ or staging area

S . N o	Environmental Parameter	Potential Environmental Impacts	Level of Impact L/M/H ²⁵	Nature of impact	Project Stage			Minimum Mitigation measures ²⁴
					Design & Pre- regeneratio n	Regenerati on works	Operatio n	
RE-GENERATION WORKS ²⁶								
								<ul style="list-style-type: none"> Place clear signs at work sites in view of the public, warning people of potential dangers such as moving vehicles, etc. and raising awareness on safety issues
4	Socio- economics	Beneficial impacts / job opportunities Influx of migrant workers	H	Direct/ Regional		x	x	<ul style="list-style-type: none"> Hiring for temporary construction / demolition jobs Emphasis given to local hiring Overall economic growth of the region

RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST

Instructions: Answer the questions assuming the **“without mitigation”** case. The purpose is to identify potential impacts. Use the “remarks” section to discuss any anticipated mitigation measures.

Package Number: _____

Package Title: _____

Components: _____

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area...			
▪ Densely populated?			
▪ Heavy with development activities?			
▪ Adjacent to or within any environmentally sensitive areas?			
• Cultural heritage site			
• Protected Area			
• Wetland			
• Mangrove			
• Estuarine			
• Buffer zone of protected area			
• Special area for protecting biodiversity			
• Bay			
B. Potential Environmental Impacts Will the Project cause...			
▪ impacts on the sustainability of associated sanitation and solid waste disposal systems and their interactions with other urban services.			
▪ deterioration of surrounding environmental conditions due to rapid urban population growth, commercial and industrial activity, and increased waste generation to the point that both manmade and natural systems are			

Screening Questions	Yes	No	Remarks
overloaded and the capacities to manage these systems are overwhelmed?			
▪ degradation of land and ecosystems (e.g. loss of wetlands and wild lands, coastal zones, watersheds and forests)?			
▪ dislocation or involuntary resettlement of people?			
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable group?			
▪ degradation of cultural property, and loss of cultural heritage and tourism revenues?			
▪ occupation of low-lying lands, floodplains and steep hillsides by squatters and low-income groups, and their exposure to increased health hazards and risks due to pollutive industries?			
▪ water resource problems (e.g. depletion/degradation of available water supply, deterioration for surface and ground water quality , and pollution of receiving waters?			
▪ air pollution due to urban emissions?			
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical and biological hazards during project construction and operation?			
▪ road blocking and temporary flooding due to land excavation during rainy season?			
▪ noise and dust from construction activities?			
▪ traffic disturbances due to construction material transport and wastes?			
▪ temporary silt runoff due to construction?			
▪ hazards to public health due to ambient, household and occupational pollution,			

Screening Questions	Yes	No	Remarks
thermal inversion, and smog formation?			
▪ water depletion and/or degradation?			
▪ overpaying of ground water, leading to land subsidence, lowered ground water table, and salinization?			
▪ contamination of surface and ground waters due to improper waste disposal?			
▪ pollution of receiving waters resulting in amenity losses, fisheries and marine resource depletion, and health problems?			
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ social conflicts if workers from other regions or countries are hired?			
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during operation and construction?			
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?			

A Checklist for Preliminary Climate Risk Screening

Screening Questions		Score	Remarks ¹
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?		
	Would the project design (e.g., the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?		
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?		
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?		
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g., annual power production) of project output(s) (e.g., hydro-power generation facilities) throughout their design lifetime?		

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high risk project.

Result of Initial Screening (Low, Medium, High): _____

Other Comments: _____

Prepared by: _____

¹If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

No Mitigation Scenario (Scoping Checklist)

Instructions: Answer the questions based on subproject/package information. Discuss/consult design engineers, social safeguards team and other technical experts to ensure most recent information is used. The answers will be used in the preparation of EIA/IEE and EMP. If subproject/package will involve rehabilitation/expansion of existing facility, specify in the checklist (audit is required as part of the EIA/IEE).

PART 1: Project Characteristics

No.	Questions to be considered in Scoping	Yes No n/a Not Sure	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why? (See last page for Questions to Guide Assessing Significance of Impacts)
1. Will construction, operation or decommissioning of the Project involve actions which will cause physical changes in the locality (topography, land use, changes in waterbodies, etc.)?				
1.1	Permanent or temporary change in land use, land cover or topography including increases in intensity of land use?			
1.2	Clearance of existing land, vegetation and buildings?			
1.3	Creation of new land uses?			
1.4	Pre-construction investigations e.g., boreholes, soil testing?			
1.5	Construction works?			
1.6	Demolition works?			
1.7	Temporary sites used for construction works or housing of construction workers?			
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations?			
1.9	Underground works			

No.	Questions to be considered in Scoping	Yes No n/a Not Sure	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why? (See last page for Questions to Guide Assessing Significance of Impacts)
	including mining or tunnelling?			
1.10	Reclamation works?			
1.11	Dredging?			
1.12	Coastal structures e.g., seawalls, piers?			
1.13	Offshore structures?			
1.14	Production and manufacturing processes?			
1.15	Facilities for storage of goods or materials?			
1.16	Facilities for treatment or disposal of solid wastes or liquid effluents?			
1.17	Facilities for long term housing of operational workers?			
1.18	New road, rail or sea traffic during construction or operation?	No		
1.19	New road, rail, air, waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?	No		
1.20	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?			
1.21	New or diverted transmission lines or pipelines?			

No.	Questions to be considered in Scoping	Yes No n/a Not Sure	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why? (See last page for Questions to Guide Assessing Significance of Impacts)
1.22	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?			
1.23	Stream crossings?			
1.24	Abstraction or transfers of water from ground or surface waters?			
1.25	Changes in water bodies or the land surface affecting drainage or run-off?			
1.26	Transport of personnel or materials for construction, operation or decommissioning?			
1.27	Long term dismantling or decommissioning or restoration works?			
1.28	Ongoing activity during decommissioning which could have an impact on the environment?			
1.29	Influx of people to an area in either temporarily or permanently?			
1.30	Introduction of alien species?			
1.31	Loss of native species or genetic diversity?			
1.32	Any other actions?			
2. Will construction or operation of the Project use natural resources such as				

No.	Questions to be considered in Scoping	Yes No n/a Not Sure	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why? (See last page for Questions to Guide Assessing Significance of Impacts)
land, water, materials or energy, especially any resources which are non-renewable or in short supply?				
2.1	Land especially undeveloped or agricultural land?			
2.2	Water?			
2.3	Minerals?			
2.4	Aggregates?			
2.5	Forests and timber?			
2.6	Energy including electricity and fuels?			
2.7	Any other resources?			
3. Will the Project involve use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?				
3.1	Will the project involve use of substances or materials which are hazardous or toxic to human health or the environment (flora, fauna, water supplies)?			
3.2	Will the project result in changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)?			
3.3	Will the project affect the welfare of people e.g. by changing living conditions?			
3.4	Are there especially vulnerable groups of people who could be affected by the project			

No.	Questions to be considered in Scoping	Yes No n/a Not Sure	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why? (See last page for Questions to Guide Assessing Significance of Impacts)
	e.g. hospital patients, the elderly? (check this with the Social Safeguards Team)			
3.5	Any other causes?			
4. Will the Project produce solid wastes during construction or operation or decommissioning?				
4.1	Spoil, overburden or mine wastes?			
4.2	Municipal waste (household and or commercial wastes)?			
4.3	Hazardous or toxic wastes (including radioactive wastes)?			
4.4	Other industrial process wastes?			
4.5	Surplus product?			
4.6	Sewage sludge or other sludge from effluent treatment?			
4.7	Construction or demolition wastes?			
4.8	Redundant machinery or equipment?			
4.9	Contaminated soils or other material?			
4.10	Agricultural wastes?			
4.11	Any other solid wastes?			
5. Will the Project release pollutants or any hazardous, toxic or noxious substances to air?				
5.1	Emissions from combustion of fossil fuels from stationary or			

No.	Questions to be considered in Scoping	Yes No n/a Not Sure	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why? (See last page for Questions to Guide Assessing Significance of Impacts)
	mobile sources (vehicles and/or heavy equipment)?			
5.2	Emissions from production processes?			
5.3	Emissions from materials handling including storage or transport?			
5.4	Emissions from construction activities including plant and equipment?			
5.5	Dust or odours from handling of materials including construction materials, sewage and waste?			
5.6	Emissions from incineration of waste?			
5.7	Emissions from burning of waste in open air (eg slash material, construction debris)?			
5.8	Emissions from any other sources?			
6. Will the Project cause noise and vibration or release of light, heat energy or electromagnetic radiation?				
6.1	From operation of equipment eg engines, ventilation plant, crushers?			
6.2	From industrial or similar processes?			
6.3	From construction or demolition?			

No.	Questions to be considered in Scoping	Yes No n/a Not Sure	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why? (See last page for Questions to Guide Assessing Significance of Impacts)
6.4	From blasting or piling?			
6.5	From construction or operational traffic?			
6.6	From lighting or cooling systems?			
6.7	From sources of electromagnetic radiation (consider effects on nearby sensitive equipment as well as people)?			
6.8	From any other sources?			
7. Will the Project lead to risks of contamination of land or water from releases of pollutants onto the ground or into sewers, surface waters, groundwater, coastal waters or the sea?				
7.1	From handling, storage, use or spillage of hazardous or toxic materials?			
7.2	From discharge of sewage or other effluents (whether treated or untreated) to water or the land?			
7.3	By deposition of pollutants emitted to air, onto the land or into water?			
7.4	From any other sources?			
7.5	Is there a risk of long term build-up of pollutants in the environment from these sources?			

No.	Questions to be considered in Scoping	Yes No n/a Not Sure	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why? (See last page for Questions to Guide Assessing Significance of Impacts)
8. Will there be any risk of accidents during construction or operation of the Project which could affect human health or the environment?				
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous or toxic substances?			
8.2	From events beyond the limits of normal environmental protection e.g., failure of pollution control systems?			
8.3	From any other causes?			
8.4	Could the project be affected by natural disasters causing environmental damage (e.g., floods, earthquakes, landslip, etc.)?			
9. Will the Project result in social changes, for example, in demography, traditional lifestyles, employment?				
9.1	Changes in population size, age, structure, social groups etc.?			
9.2	By resettlement of people or demolition of homes or communities or community facilities e.g., schools, hospitals, social facilities?			
9.3	Through in-migration of new residents or			

No.	Questions to be considered in Scoping	Yes No n/a Not Sure	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why? (See last page for Questions to Guide Assessing Significance of Impacts)
	creation of new communities?			
9.4	By placing increased demands on local facilities or services eg housing, education, health?			
9.5	By creating jobs during construction or operation or causing the loss of jobs with effects on unemployment and the economy?			
9.6	Any other causes?			
10. Are there any other factors which should be considered such as consequential development which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality?				
10.1	Will the project lead to pressure for consequential development which could have significant impact on the environment e.g., more housing, new roads, new supporting industries or utilities, etc.?			
10.2	Will the project lead to development of supporting facilities, ancillary development or development stimulated by the project which could have impact on			

No.	Questions to be considered in Scoping	Yes No n/a Not Sure	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why? (See last page for Questions to Guide Assessing Significance of Impacts)
	the environment e.g. supporting infrastructure (roads, power supply, waste or wastewater treatment, etc.) housing development extractive industries supply industries other?			
10.3	Will the project lead to after-use of the site which could have an impact on the environment?			
10.4	Will the project set a precedent for later developments?			
10.5	Will the project have cumulative effects due to proximity to other existing or planned projects with similar effects?			

Part 2 - Characteristics of the Project Environment (Environmental Sensitivity)

Question	Remarks
<p>Are there features of the local environment on or around the Project location which could be affected by the Project?</p> <ul style="list-style-type: none"> • Areas which are protected under international or national or local legislation for their ecological, landscape, cultural or other value, which could be affected by the project? • Other areas which are important or 	

Question	Remarks
<p>sensitive for reasons of their ecology e.g.</p> <ul style="list-style-type: none"> ○ Wetlands, ○ Watercourses or other waterbodies, ○ the coastal zone, ○ mountains, ○ forests or woodlands <ul style="list-style-type: none"> • Areas used by protected, important or sensitive species of fauna or flora e.g., for breeding, nesting, foraging, resting, overwintering, migration, which could be affected by the project? • Inland, coastal, marine or underground waters? • Areas or features of high landscape or scenic value? • Routes or facilities used by the public for access to recreation or other facilities? • Transport routes which are susceptible to congestion or which cause environmental problems? • Areas or features of historic or cultural importance? 	
<p>Is the Project in a location where it is likely to be highly visible to many people?</p>	
<p>Is the Project located in a previously undeveloped area where there will be loss of greenfield land?</p>	
<p>Are there existing land uses on or around the Project location which could be affected by the Project? For example:</p> <ul style="list-style-type: none"> • homes, gardens, other private property, • industry, • commerce, • recreation, • public open space, • community facilities, • agriculture, • forestry, 	

Question	Remarks
<ul style="list-style-type: none"> • tourism, • mining or quarrying 	
<p>Are there any plans for future land uses on or around the location which could be affected by the Project?</p>	
<p>Are there any areas on or around the location which are densely populated or built-up, which could be affected by the Project?</p>	
<p>Are there any areas on or around the location which are occupied by sensitive land uses which could be affected by the Project?</p> <ul style="list-style-type: none"> • hospitals, • schools, • places of worship, • community facilities 	
<p>Are there any areas on or around the location which contain important, high quality or scarce resources which could be affected by the Project? For example:</p> <ul style="list-style-type: none"> • groundwater resources, • surface waters, • forestry, • agriculture, • fisheries, • tourism, • minerals. 	
<p>Are there any areas on or around the location of the Project which are already subject to pollution or environmental damage? For example:</p> <ul style="list-style-type: none"> • where existing legal environmental standards are exceeded, which could be affected by the Project 	
<p>Is the Project location susceptible to earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions? For example:</p>	

Question	Remarks
<ul style="list-style-type: none"> • temperature inversions, fogs, severe winds, which could cause the Project to present environmental problems? 	
<p style="text-align: center;">Is the Project likely to affect the physical condition of any environmental media?</p> <ul style="list-style-type: none"> • The atmospheric environment including microclimate and local and larger scale climatic conditions? • Water – e.g., quantities, flows or levels of rivers, lakes, groundwater. Estuaries, coastal waters or the sea? • Soils – e.g., quantities, depths, humidity, stability or erodibility of soils? • Geological and ground conditions? 	
<p style="text-align: center;">Are releases from the Project likely to have effects on the quality of any environmental media?</p> <ul style="list-style-type: none"> • local air quality • global air quality including climate change and ozone depletion • water quality – rivers, lakes, groundwater. estuaries, coastal waters or the sea • nutrient status and eutrophication of waters • acidification of soils or waters • soils • noise • temperature, light or electromagnetic radiation including electrical interference • productivity of natural or agricultural systems 	
<p style="text-align: center;">Is the Project likely to affect the availability or scarcity of any resources either locally or globally?</p> <ul style="list-style-type: none"> • fossil fuels • water • minerals and aggregates • timber • other non-renewable resources • infrastructure capacity in the locality - 	

Question	Remarks
water, sewerage, power generation and transmission, telecommunications • waste disposal roads, rail	
<p>Is the Project likely to affect human or community health or welfare?</p> <ul style="list-style-type: none"> • The quality or toxicity of air, water, foodstuffs and other products consumed by humans? • Morbidity or mortality of individuals, communities or populations by exposure to pollution? • Occurrence or distribution of disease vectors including insects? • Vulnerability of individuals, communities or populations to disease? • Individuals' sense of personal security? • Community cohesion and identity? • Cultural identity and associations? • Minority rights? • Housing conditions? • Employment and quality of employment? • Economic conditions? • Social institutions? 	

Questions to Guide Significance of Impacts

1. Will there be a large change in environmental conditions?
2. Will new features be out-of-scale with the existing environment?
3. Will the effect be unusual in the area or particularly complex?
4. Will the effect extend over a large area?
5. Will there be any potential for trans boundary impact?
6. Will many people be affected?
7. Will many receptors of other types (fauna and flora, businesses, facilities) be affected?
8. Will valuable or scarce features or resources be affected?
9. Is there a risk that environmental standards will be breached?
10. Is there a risk that protected sites, areas, features will be affected?
11. Is there a high probability of the effect occurring?
12. Will the effect continue for a long time?
13. Will the effect be permanent rather than temporary?
14. Will the impact be continuous rather than intermittent?
15. If it is intermittent will it be frequent rather than rare?
16. Will the impact be irreversible?
17. Will it be difficult to avoid, or reduce or repair or compensate for the effect?

Prepared by:	
Designation and Office:	
Date:	

OUTLINE OF INITIAL ENVIRONMENTAL EXAMINATION REPORT

1. An initial environmental examination (IEE) report is required for all environment B projects. Its level of detail and comprehensiveness is commensurate with the significance of potential environmental impacts and risks. An IEE report will follow the outline below. The substantive aspects of this outline will guide the preparation of environmental impact assessment reports, although not necessarily in the order shown. Sample IEEs have been prepared during loan processing, which will serve as actual reference for the preparation of IEE reports of future subprojects.
2. **Executive Summary.** Describe concisely the critical facts, significant findings, and recommended actions.
3. **Policy, Legal, and Administrative Framework.** Discuss the national and local legal and institutional framework within which the environmental assessment is carried out. Identify project-relevant international environmental agreements to which Government of Bangladesh is a party.
4. **Description of the Project.** Describe the project, its major components, and its geographic, ecological, social, and temporal context, including any associated facility required by and for the subproject/package (for example, access roads, power plants, water supply, quarries and borrow pits, and spoil disposal). Include drawings and maps showing the project's layout and components, the subproject site, and the subproject's area of influence.
5. **Description of the Environment (Baseline Data).** Describe relevant physical, biological, and socioeconomic conditions within the subproject area. Include any known current and proposed development activities within the subproject's area of influence, including those not directly connected to the subproject. Indicate the accuracy, reliability, and sources of the data.
6. **Anticipated Environmental Impacts and Mitigation Measures.** Predict and assess the subproject's likely positive and negative direct and indirect impacts to physical, biological, socioeconomic (including occupational health and safety, community health and safety, vulnerable groups and gender issues, and impacts on livelihoods through environmental media and physical cultural resources in the subproject's area of influence, in quantitative terms to the extent possible; identify mitigation measures and any residual negative impacts that cannot be mitigated; explore opportunities for enhancement; identify and estimate the extent and quality of available data, key data gaps, and uncertainties associated with predictions and specify topics that do not require further attention; and examine global, trans boundary, and cumulative impacts as appropriate.
7. **Analysis of Alternatives.** Examine alternatives to subproject or subproject component site, technology, design, and operation—including the no project alternative—in terms of their potential environmental impacts; the feasibility of mitigating these impacts; their capital and recurrent costs; their suitability under local conditions; and their institutional, training, and monitoring requirements. State the basis for selecting the particular subproject design proposed and, justify recommended emission levels and approaches to pollution prevention and abatement.
8. **Information Disclosure, Consultation, and Participation.** (i) Describe the process undertaken during subproject design and preparation for engaging stakeholders, including information disclosure and consultation with affected people and other stakeholders; (ii) Summarize comments and concerns received from affected people and other stakeholders and how these comments have been addressed in subproject design and mitigation measures, with

special attention paid to the needs and concerns of vulnerable groups, including women, the poor, and Indigenous Peoples; and (iii) Describe the planned information disclosure measures (including the type of information to be disseminated and the method of dissemination) and the process for carrying out consultation with affected people and facilitating their participation during subproject implementation.

9. **Grievance Redress Mechanism.** Describe the grievance redress framework (both informal and formal channels), setting out the time frame and mechanisms for resolving complaints about environmental performance.

10. **Environmental Management Plan.** Describe and discuss the set of mitigation and management measures to be taken during subproject implementation to avoid, reduce, mitigate, or compensate for adverse environmental impacts (in that order of priority). Include multiple management plans and actions, if necessary. Include the following key components (with the level of detail commensurate with the subproject's impacts and risks):

- (i) **Mitigation.** Identify and summarize anticipated significant adverse environmental impacts and risks; describe each mitigation measure with technical details, including the type of impact to which it relates and the conditions under which it is required (for instance, continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate; and provide links to any other mitigation plans (for example, for involuntary resettlement, Indigenous Peoples, or emergency response) required for the subproject.
- (ii) **Monitoring.** Describe the monitoring measures with technical details, including parameters to be measured, methods to be used, sampling locations frequency of measurements, detection limits and definition of thresholds that will signal the need for corrective actions; and describe monitoring and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures and document the progress and results of mitigation.
- (iii) **Implementation arrangements.** Specify the implementation schedule showing phasing and coordination with overall project implementation; describe institutional or organizational arrangements, namely, who is responsible for carrying out the mitigation and monitoring measures, which may include one or more of the following additional topics to strengthen environmental management capability: technical assistance programs, training programs, procurement of equipment and supplies related to environmental management and monitoring, and organizational changes; and estimate capital and recurrent costs and describe sources of funds for implementing the environmental management plan.
- (iv) **Performance indicators.** Describe the desired outcomes as measurable events to the extent possible, such as performance indicators, targets, or acceptance criteria that can be tracked over defined time periods.

11. **Conclusion and Recommendation.** Provide the conclusions drawn from the assessment and provide recommendations.

SUBPROJECT DATA SHEET / INFORMATION DISCLOSURE

Subproject Information	Description
Name of the subproject, executing agency/implementing agency and town	
Proposed subproject technical details and project benefits	
Summary of subproject impacts	<ul style="list-style-type: none"> • Environment • Social
Compensation and entitlements	
Environmental management plan budget	
Resettlement plan budget	
Environmental management plan implementation schedule	
Resettlement plan implementation schedule	
Consultation and information disclosure requirements	
Implementation structure and grievance redress mechanism (GRM) information	
Contact numbers of PIDs, PMU	

Reviewed by: Name of Affected Person

Place:

Date:

Issues:

SAMPLE GRIEVANCE FORM*(To be available in Tamil)*

The Proposed Inclusive, Resilient and Sustainable Housing for the Urban Poor Project welcomes complaints, suggestions, queries, and comments regarding program implementation. We encourage persons with a grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback.

In case you want to include your personal details but want information to remain confidential, please type CONFIDENTIAL above your name.

Date		Place of Registration	
Contact Information/Personal Details			
Name:		Gender: Male Female	Age:
Home Address			
Village/Town			
District			
Phone no.			
E-mail			
Complaint/Suggestion/Comment/Question Please provide the details (who, what, where and how) of your Grievance below:			
How do you want us to reach you for feedback on your comment/grievance?			
FOR OFFICIAL USE ONLY			
Registered by: (Name of Official registering grievance)			
Verified through:	Note/Letter	E-mail	Verbal/Telephonic
Reviewed by: (Names/Position of Official(s) reviewing grievance)			
Action Taken:			
Whether Action Taken Disclosed:		Yes	No
Means of Disclosure:			

OUTLINE of DAILY MONITORING SHEET FOR CONTRACTORS

Contractor Monitoring Sheet

Name of Subproject: _____
 Location of Subproject: _____
 Supervising PIU: _____
 Contractor: _____
 Contractor EHS Supervisor (or equivalent): _____
 Date of monitoring: _____

Summary of Findings

Monitoring Item	Status	Remarks
1. Compliance with Local Permit Requirements		
(Secured / Application Submitted / Not Applicable)		
<i>Location/zoning permits</i>		
<i>Permit to construct</i>		
<i>Building permit</i>		
<i>Transport / hauling permits</i>		
2. Compliance with IEE Requirements		
(Approved / Under Preparation / Submitted to PIU for Approval)		
<i>Construction EMP (C-EMP)</i>		
<i>Corrective Action Plan, if any</i>		
3. Compliance with C-EMP		
Construction Site		
(Satisfactory / Needs Improvement / Not Implemented)		
- Conduct of toolbox talk		
- Use of PPE		
- Rest areas for male and female workers		
- Toilets for male and female workers		
- Medical kits		
- Drinking water supply		
- Dust control		
- Noise control		
- Solid waste management		
- Wastewater management		
- Chemicals storage (fuel, oil, etc.)		
- Siltation or erosion control		
- Heavy equipment staging / parking area		
- Barricades around excavation sites		
- Access to residential houses/shops/businesses		
- Traffic routing signages		
- Lightings at night		

- Trench shoring / landslide protection

Construction Workers' Camp Site	(Available / Needs Improvement / Not Available)
- Quarters for male and female workers	

Monitoring Item	Status	Remarks
- Sleeping utilities (e.g., beds, pillows, blankets, mosquito nets, etc.)		
- Power/Electricity supply		
- Drinking water supply		
- Toilets for male and female workers		
- General purpose water supply (cooking, washing, bathing)		
- Cooking facilities and areas		
- Solid waste management		
- Wastewater management		
- Pest control		
4. Implementation of GRM	(Yes / No or None / Under Resolution)	
<i>Complaints</i>		
<i>Complaints resolution</i>		
5. Environmental Quality Measurement	(Passed / Failed / Not Applicable)	
<i>Ambient air quality sampling</i>		
<i>Noise level measurement</i>		
<i>Receiving water quality sampling</i>		

Other Issues: _____

Attachments:

1. Copies of permits secured, if any.
2. Photos taken at worksites, if any.
(photos attached in previous monitoring sheets should not be used again).
3. Laboratory results of environmental quality measurements, if any.

Prepared by: _____
 Name, Designation and Signature

					O&M phase) ¹		

- For package with “Contract Awarded”, provide name/s and contact details of contractor/s’ nodal person/s for environmental safeguards.

Package-wise Contractor/s’ Nodal Persons for Environmental Safeguards

Package Name	IEE Cleared by ADB (provide date)	Contractor	EHS Nodal Person	Email Address	Contact Number

STATUS OF IEE PER SUBPROJECT/PACKAGE

- Provide status of updated/final IEE² per package.

Package-wise Implementation Status

Package Number	Final IEE based on Detailed Design				Site-specific EMP or Construction (C-EMP) approved by Chief Engineer ³ (Yes/No)	Remarks
	Not yet due (detailed design not yet completed)	Submitted to ADB (provide date of submission)	Disclosed on project website (provide link)	Final IEE provided to Contractor/s (Yes/No)		

Compliance status with National/State/Local statutory environmental requirements⁴

Package Number	Statutory Environmental Requirements ⁵	Status of Compliance (Specify if obtained,	Validity Date(s) (if already	Action Required	Specific Conditions that will require

¹ If on-going construction, include %physical progress and expected date of completion.

² IEE prepared based on preliminary design and cleared by ADB with condition that updated/Final IEE based on detailed design will be submitted.

³ Works will not be allowed until site specific EMP is approved by the PMU and/or PIU.

⁴ All statutory clearance/s, no-objection certificates, permit/s, etc. should be obtained prior to award of contract/s. Attach

as Appendix all clearances obtained during the reporting period. If already reported, specify in the “remarks” column.

⁵ Specify statutory requirements: environmental clearance? Permit/consent to establish? Forest clearance? Workers/Labor permit, etc.

		submitted and awaiting approval, application not yet submitted)	obtained)		environmental monitoring as per environmental clearance, consent / permit to establish ⁶

Compliance status with environmental loan covenants

Schedule No. and Item (see Project Loan Agreement and list provisions / paragraph relevant to environmental safeguards, core labor standards, occupational EHS, community health and safety)	Covenant	Status of Compliance	Action Required

Compliance status with the environmental management plan (refer to EMP tables in approved IEE/s)

- Confirm in IEE/s if contractors are required to submit construction EMPs (C-EMP). If not, describe the methodology of monitoring each package under implementation.
- Provide over-all compliance of the contractors with C-EMP. This should be supported by contractors' monthly monitoring reports to PIU(s) and/or verification reports of PIU(s) or project consultants. Include as an Appendix supporting documents such as **signed** monthly environmental site inspection reports prepared by consultants and/or contractors.

Overall Compliance with C-EMP

Package Number	Status of C-EMP Implementation (Excellent/ Satisfactory/ Partially Satisfactory/ Below Satisfactory)	Action Proposed and Additional Measures Required

⁶Example: Environmental Clearance requires ambient air quality monitoring, Forest Clearance/Tree-cutting Permit requires 2 trees for every tree, etc.

--	--	--

- Provide description based on site observations and records:
 - Confirm if any dust was noted to escape the site boundaries and identify dust suppression techniques followed for site/s.
 - Identify muddy water was escaping site boundaries or muddy tracks were seen on adjacent roads.
 - Identify type of erosion and sediment control measures installed on site/s, condition of erosion and sediment control measures including if these were intact following heavy rain.
 - Identify designated areas for concrete works, chemical storage, construction materials, and re-fueling. Attach photographs of each area.
 - Confirm spill kits on site and site procedure for handling emergencies.
 - Identify any chemical stored on site and provide information on storage condition. Attach photograph.
 - Describe management of stockpiles in each work site (construction materials, excavated soils, spoils, etc.). Provide photographs.
 - Describe management of solid and liquid wastes on-site (quantity generated, transport, storage and disposal). Provide photographs.
 - Provide information on barricades, signages, and on-site boards. Provide photographs.
 - Provide information on construction / workers camp(s). Provide photographs.
 - Provide information on work-related accidents and incidents. Describe actions implemented.
 - Provide information on if there are any activities being undertaken out of working hours and how that is being managed.

- Provide list of trainings on environmental safeguards, core labor standards, and Occupational environment, health and safety conducted during the reporting period. Include ADB-organized workshop, trainings, seminars, etc)

Trainings, Workshops and Seminars Conducted

Date	Topic	Conducted by	No. of Participants (Total)	No. of Participants (Female)	Remarks

- Provide the monitoring results as per the parameters outlined in the approved EMP (or C-EMP when applicable).

Summary of Environmental Monitoring Activities (for the Reporting Period)⁷

⁷ Attach Laboratory Results and Sampling Map/Locations

Impacts (List from C-EMP)	Mitigation Measures (List from C-EMP)	Parameters Monitored (As identified in the C-EMP)	Method of Monitoring (Visual, Actual Sampling, etc.)	Location of Monitoring (Provide GPS Coordinates) ⁸	Date of Monitoring Conducted	Person Who Conducted the Monitoring
Design Phase						
Pre-Construction Phase						
Construction Phase						
Operational Phase						

Monitoring of environmental IMPACTS on PROJECT SURROUNDINGS

- Confirm records of pre-work condition of roads, agricultural land or other infrastructure prior to starting to transport materials and construction.

Package Number.	Status of Pre-Work Conditions (Recorded / Not Recorded)	Baseline Environmental Conditions (air, water, noise) Documented. (Yes / No)	Action Proposed and Additional Measures Required

- Provide information on monitoring activities conducted during reporting period. If not conducted, provide justification. Compare results with baseline and internationally recognized standards.⁹

Air Quality Monitoring Results

Site	Date of	Site Location	Parameters (as	Remarks
------	---------	---------------	----------------	---------

⁸ If GPS coordinate is not available, provide landmark(s) and/or chainage.

⁹ ADB Safeguard Policy Statement (SPS) Appendix 1, para 33: During the design, construction, and operation of the project the borrower/client will apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines. These standards contain performance levels and measures that are normally acceptable and applicable to projects. When host country regulations differ from these levels and measures, the borrower/client will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view

of specific project circumstances, the borrower/client will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in the SPS.

No.	Testing	(Provide GPS Coordinates) ¹⁰	required by statutory clearances or as mentioned in the IEE)		
			PM10 µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³

Water Quality Monitoring Results

Site No.	Date of Sampling	Site Location	Parameters (as required by statutory clearances or as mentioned in the IEE)						Remarks
			pH	Conductivity µS/cm	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L	

Noise Quality Monitoring Results

Site No.	Date of Testing	Site Location	LA _{eq} (dBA) (as required by statutory clearances or as mentioned in the IEE)		Remarks
			Day Time	Night Time	

INFORMATION DISCLOSURE, PARTICIPATION AND CONSULTATIONS

- Confirm PMU/PIU/contractors provide project-related information to stakeholders, communities and/or affected people before and during construction works.¹¹
- Provide information on consultations conducted during reporting period such dates, topics discussed, type of consultation, issues/concerns raised, safeguards team member present. Attach minutes of meetings (ensure English translation is provided), attendance sheet, and photos.

Date of Consultation	Location	Number of Participants (specify total, male and female)	Issues/Concerns Raised	Response to issues/concerns

¹⁰ If GPS coordinate is not available, provide landmark(s) and/or chainage.

¹¹ Check EMP requirement on information disclosure. At a minimum, PIU through the contractor should notify communities/affected persons/sensitive receptors 7 days and again 1 day before start of works.

Grievance Redress Mechanism

- **Grievance Redress Mechanism.** Provide information on establishment of grievance redress mechanism and capacity of grievance redress committee to address project-related issues/complaints. Include as an Appendix - Notification of the GRM (package-wise if applicable).
- **Complaints Received during the Reporting Period.** Provide information on number, nature, and resolution of complaints received during reporting period. Attach records as per GRM in the approved IEE. Identify safeguards team member/s involved in the GRM process. Attach minutes of meetings (ensure English translation is provided).

Summary of key issues/concerns identified during the reporting period and remedial actions.

- Provide corrective action plan which should include all issues/concerns, actions required to be implemented, responsible entities, and target dates.

Status of corrective actions from previous monitoring report(s)

- Provide information on corrective actions to be implemented as reported in the previous monitoring report(s). Include status of implementation of feedbacks/comments/suggestions as provided by ADB, if any.

Corrective Action Plan Status

Issues/Concerns	Corrective Action	Status	Remarks

APPENDIXES

- Photos
- Records of consultations
- Copies of environmental clearances and permits (if not provided in the previous monitoring report)
- Environmental site inspection report (if not provided in the previous monitoring report)
- Other

Appendix 11

**TERMS OF REFERENCE
SAFEGUARDS IMPLEMENTATION
ENVIRONMENTAL CONSULTANT AT PMU AND ENVIRONMENTAL SPECIALIST AT PIDS**

A. OBJECTIVE

To ensure effective implementation and monitoring of environmental safeguards policies and procedures and to support the PMU team, one (1) environmental consultant will be assigned to the PMU Environmental Team.

The PMU will be supported by a total of three (3) Project Implementation Divisions (PIDs). Each PID will have one (1) environmental specialist assigned to the PID Environmental Cell.

B. SCOPE OF WORK

The environmental consultant / specialist will be responsible for safeguards implementation and monitoring in line with requirements of ADB Safeguards Policy Statement (SPS) 2009 and national regulatory framework for subprojects under output 1 of the Inclusive, Resilient and Sustainable Housing for the Urban Poor Project in Tamil Nadu (IRSHUPP) project financed by ADB. They may also support work on safeguard requirements for World Bank funder projects and streamline safeguards implementation for other housing development projects. The PMU environmental consultant will work in close coordination with PID environmental specialist, and other staff of the Environmental Cell, line departments of TNSCB, and under the overall direction of the Joint Managing Director, TNSCB. Their primary role will be to support the implementation and monitoring of safeguards for IRSHUPP.

The environmental consultant / specialist will ensure environmental safeguards consideration in project design, construction and operation of the IRSHUPP project, to avoid/minimize adverse environmental impacts and meet internationally accepted performance indicators. They shall review, strengthen/update all environmental documents, such as initial environmental examination, environment impact assessments, environmental assessment and review frameworks, environmental management plans in accordance with the Government's and ADB's relevant policies and procedures. They will review and track submission of safeguard monitoring reports and compliance with disclosure requirements. They will also be responsible to ensure health and safety considerations including issues related to COVID 19 pandemic, are adequately covered and costed.

The environmental consultant / specialist will assist in capacity development and institutional training relevant to ADB SPS 2009 and compliance with its requirements. The environmental consultant / specialist will also conduct field verifications and consultations as part of project due diligence and monitoring.

The environmental consultant / specialist will work in close coordination with the PMU staff, social cell, line departments of TNSCB and under the overall direction of the Joint Managing Director, TNSCB. Detailed tasks and responsibilities are listed below.

C. DETAILED TASKS

The following are the detailed tasks for the PMU (Environment Team) - Environment Consultant:

4.1 GENERAL

- Provide information and advice to other PMU Teams and PIDs on the environmental safeguard implementation for housing development projects such as:
 - International Finance Corporation (World Bank Group) Environment, Health and Safety or IFC (WBG) EHS Guidelines and Guidance Notes
 - World Bank's Operational Policies and Guidelines
 - Best practices in green building and urban greening concepts in the planning / design, implementation and operational stages of housing projects
- Participate in external meetings, seminars, conferences and other events on behalf of TNSCB to (a) present's TNSCB's work and (b) obtain up- to-date information on best-in-class technologies and approaches relevant to safeguards and EHSmanagement
- Liaise with other Government agencies such as the Chennai Rivers Restoration Trust (CRRT) and Chennai Corporation (particularly, the Smart City initiatives) and other implementing partners on an ongoingbasis
- Liaise closely, via the TNSCB, where technical guidance is required, with the Environmental Specialists of the World Bank and/or Asian Development Bank taskteam
- Coordinate and support the staff of the PID Environmental Cell in coordinating with the World Bank and Asian Development Bank as may be required in terms of planning missions / site visits, furnishing documents and responding to otherrequests
- Assist and facilitate the development and implementation of the EHS management systems within TNSCB for housing development projects including IRSHUPP / TNHHP

4.2 TASKS SPECIFIC TO OUTPUT 1 UNDER IRSHUPP

- Ensure subproject compliance to GOI statutory and legal environmental requirements, ADB SPS 2009, the project EARF, and loan covenants across the project cycle
- Ensure subprojects conforms to exclusion criteria and subproject selection guidelines as stipulated in the EARF
- Review and approve subproject category for environment
- Review and approve subproject IEE studies and reports and EMPs and submit to ADB for approval
- Ensure that updated subproject IEEs and EMPs reflect final subproject detailed design and submit to ADB for approval
- Check whether all relevant permits / environment clearances/approvals are obtained in a timely manner
- Ensure that EMPs are included in bidding documents and civil works contracts
- Ensure an efficient subproject implementation in line with IEE studies and reports and EMPs with adequate budget
- Review and approve quarterly environmental monitoring reports submitted by PIDs (Environment / Social Cell)
- Prepare quarterly monitoring reports and submit to ADB

- Ensure effective GRM set up and monitor grievances redress process and ensure timely redress by PIDs and contractors and other parties
- Ensure adequate awareness campaigns, information disclosure etc., are held within affected communities to minimize resistance and ensure hassle free transition for the project beneficiaries to new settlement sites
- Promote community participation in planning and design process
- Periodical review of safeguards related loan covenants, and the compliance in project implementation
- Organize periodic capacity building and training programs for subproject staff in safeguards
- Ensure timely compensation as per ADB Entitlement matrix and GOI norms
- Ensuring availability of budget for safeguards activities
- Ensuring disclosure of EARF, IEEs and EMPs, and monitoring documents

4.3 ADDITIONAL TASKS DURING PLANNING AND DESIGN STAGE

- Prepare terms of references (TOR) / requests for proposal for conducting environmental assessments for proposed housing development projects including the GOI Environmental Impact Assessment (EIA) in accordance with National environmental regulatory framework and in line with ADB SPS 2009 / World Bank's safeguard policies
- Review proposals received from individual consultants and/or consulting firms and advise in the decision-making among the various Request for Proposals responses received
- Coordinate works for the GOI EIA with the selected EIA consultants, and provide the required information and site-level decisions that may be required of the TNSCB officials
- Support the selected EIA consultants in conducting stakeholder / public consultations that is required as a part of the EIA process, and assist with meetings with other Government departments / agencies
- Review and approve GOI EIA studies and reports
- Ensure that updated GOI EIA studies and reports reflect final subproject detailed design
- Submit draft GOI EIA studies and reports to the World Bank for obtaining their clearance as required by the World Bank's operational policies
- Facilitate the translation of the Executive Summary of the GOI EIA studies and reports to local languages
- Disclose the draft GOI EIA studies reports and translated Executive Summary on TNSCB website and support PIDs in information disclosure at physical locations on the ground
- Review and approve inputs by the selected EIA consultants in bidding documents and civil works contracts
- Review and approve contractor's bid evaluation process and provide inputs relevant to environmental performance that may be important in the decision-making
- Ensure that IEE studies and GOI EIA studies for a subproject is prepared concurrently to avoid any inconsistencies and ensure robust environmental assessment is undertaken
- Disseminate information on the good practices under the IRSHUPP / TNHHP housing development projects to other TNSCB projects wherever relevant

The following are the detailed tasks for the PID (Environmental Cell) - Environment Specialist:

5.1 TASKS SPECIFIC TO OUTPUT 1 UNDER IRSHUPP

- Support the PMU in preparing and/or updating, reviewing, and finalizing safeguard documents (including but not limited to) environmental assessment and review framework (EARF), environmental impact assessment (EIA), initial environmental examination (IEE), environmental management plans (EMP) safeguards compliance report, time bound environmental safeguards corrective action plans and environmental audits of the proposed project in line with ADB requirements.
- Identify, select and screen subprojects in compliance with the key exclusion criteria and subproject selection guidelines stipulated in the environmental assessment and review framework (EARF) and relevant screening checklists. Conduct regular site visits for overseeing compliance with safeguards
- Prepare screening checklists and conduct classification of the sub-projects and submit to PMU for confirmation; update checklist and category as and when required to reflect subproject changes, and report to PMU
- Work closely with design teams to include environmental considerations in subproject location, design and technical specifications.
- Identify and obtain statutory environmental clearance/permissions/approvals required for subproject
- Include standards/conditions, if any, stipulated in regulatory clearances, consents in the subproject detailed design
- Conduct environmental baseline surveys including assessment of hazards and risks the projects may pose to the environment and people Prepare IEE or environmental due diligence report (DDR), and/or environmental management plans (EMPs) as required by country's environmental legal frameworks and ADB SPS 2009, and submit to PMU for approval Update subproject IEE studies and reports and EMPs to reflect any changes in subproject during detail design / implementation; IEE shall reflect the final subproject design; IEE shall also be updated in case of any unanticipated impacts
- Calculate and provide to relevant team members the indicative costs to implement package-wise EMPs, environmental monitoring programs, awareness programs, etc.
- Conduct adequate awareness campaigns are held with affected persons and within the host communities to minimize resistance and ensure hassle free transition for the affected persons / resettled households to new locations
- Conduct and document meaningful consultation in compliance with the EARF and IEEs; disclose relevant information on safeguards to stakeholders, affected people etc. reflect inputs from public consultation in subproject IEE studies and reports and EMPs
- Ensure that relevant provisions of the EMP are fully included in bid and contract documents (for all contracts, include full IEE studies and EMP in bids and relevant costs and clauses are included in the contract and bill of quantities)
- Review and approval of contractor site specific C-EMP / D-EMP
- Ensure implementation and compliance of subproject C-EMP / D-EMP by contractors
- Establish project GRM acceptable to ADB at divisional level; coordinate grievance redress process, ensure registration, record-keeping/ documentation, information dissemination, etc., and ensure timely actions by all parties; report to PMU
- Conduct training and capacity building activities (workshops, hands-on trainings, visits etc.) to contractors and field level staff in subproject IEEs and EMPs implementation
- Undertake internal monitoring and supervision and record observations throughout the subproject preparation and implementation period; identify issues that require intervention of senior TNSCB management in consultation with the PMU
- Ensure contractors follow their obligations as prescribed in the EARF and subproject

specific IEEs and EMPs

- Review and approval of contractor's monthly report, consolidation into quarterly progress reports and submission to PMU
- Submit periodic monitoring reports¹ to the PMU, who will then submit these to the ADB

5.2 ADDITIONAL TASKS DURING IMPLEMENTATION / OPERATION STAGE

- Ensure adherence to GOI environmental assessment requirements for subprojects in line with the national regulatory requirements and other safeguard requirements as per ADB SPS 2009 policies and site specific IEE and EMPs
- Conduct training and capacity building activities (workshops, hands-on trainings, visits etc.) to contractors and field level staff in safeguards implementation for housing development projects
- Conduct regular site visits for overseeing compliance with safeguards and prepare regular monitoring reports
- Prepare monthly implementation performance monitoring reports for TNSCB internal management and quarterly progress / monitoring reports for the ADB; reports should clearly identify deviations in environmental performance, if any, and corrective and preventive actions taken or being taken, and relevant loan covenants

REQUIRED QUALIFICATIONS AND EXPERIENCE AT MINIMUM

- A minimum of five years' work experience in environmental management, environmental safeguards, environment, health and safety in project implementation
- A M.Sc./M.Plan/M.E/M.Tech in a relevant technical field such as environmental management, environmental science, environment planning, civil engineering, environmental engineering from a reputed university
- Prior experience working in the housing/urban development sector will be an advantage
- Prior experience in World Bank and/or ADB funded projects will be an advantage

Professional Competencies Required at Minimum:

- Ability to read and write excellent Tamil and English and produce project reports in Tamil and English for regular and continuous presentations to World Bank and ADB staff.
- Ability to guide and deliver the range of safeguards management activities required by the project throughout design, construction and operations of a project
- Ability to interact with staff in the relevant implementing agencies and in-line departments
- Effectiveness in analyzing and resolving project implementation issues
- Familiarity with the relevant Government procedures and regulations
- High level of computer literacy, including Word, Excel, email and the internet
- Strong communication skills and good interpersonal relations

¹The monitoring report will focus on the progress of implementation of the safeguard, issues encountered and measures adopted, follow-up actions required, if any, as well as the status of compliance with subprojects election criteria and relevant loan covenants.

**TERMS OF REFERENCE
SAFEGUARDS IMPLEMENTATION
ASBESTOS / HAZARDOUS WASTE MANAGEMENT CONSULTANT**

A. OBJECTIVE

1. To ensure effective implementation of environmental safeguards procedures, one (1) asbestos / hazardous waste management expert (consultant) will be hired to assist the PMU (Environmental Team) and PIDs (Environment Cell).
2. The objective of the consulting service is to improve asbestos / hazardous waste management capacity for subprojects under output 1
3. The consultant will also provide training and capacity building to strengthen the capacity of PMU and PIDs to systematically design, implement and monitor asbestos and hazardous waste management and assessment processes, and its implementation to ensure compliance with ADB SPS requirements on environment.

B. SCOPE OF WORK

4. The consultant will assist in subproject implementation activities to ensure compliance with international and national / state standards on asbestos / hazardous waste management and ADB SPS (2009)
5. Assist in monitoring environmental compliance / performance of asbestos and hazardous waste issues in subprojects under output 1
6. Assist in establishing good documentation on asbestos and hazardous waste management, including screening, protocols and site specific management plans
7. Conduct training to PMU, PIDs, contractors etc., to understand asbestos and hazardous waste management processes in subproject design, implementation and monitoring of subproject activities under output 1.
8. The consultant will work in close coordination with PMU (Environment Team) and PID (Environment Cell), line departments of TNSCB, on-site contractors and under the overall direction of the TNSCB PMU.

C. DETAILED TASKS

9. **The following are the detailed tasks:**
 - Conduct site visits to subproject sites to meet with relevant government counterparts and undertake field investigations / surveys to ascertain locations of Asbestos Containing Materials (ACM)
 - Prepare an asbestos register, mark ACM locations on site-maps and in GIS system;
 - Develop a hazardous waste register, mark temporary waste disposal area on site maps

- Prepare asbestos and hazardous waste investigation reports and risk assessment, for all subprojects under output 1 to confirm the extent or lack of ACM
- Compile and report the results to PMU (Environment Team) and ADB
- Prepare an overall asbestos and hazardous waste management guidance, checklists and/or protocols and asbestos and hazardous waste management plan for all subprojects under output 1 in line with international and/or national and state standards that sets out steps on how asbestos and hazardous waste will be managed throughout the project cycle including temporary placement/ siting, removal, transport and disposal. For Asbestos: the guidance, checklist / protocol should also include relevant mitigation measures if it is not feasible for asbestos to be physically removed.
- Prepare monitoring and reporting requirements; this will include preparing a monitoring and reporting template report with relevant indicators for IA to monitor compliance with the asbestos management and hazardous waste management plan and report to ADB.
- Incorporate comments and feedback on the reports from the IA and ADB
- Prepare and conduct capacity building training workshops on asbestos and hazardous waste management and monitoring requirements (including type of monitoring methods / equipment) to comply with international best practices as well as national and state standards and ADB SPS requirements for PMU, PIDs, contractors and other stakeholders (local municipalities / ULB / PWD)¹ involved in subproject implementation under output 1
- Prepare a repository of reference materials on asbestos and hazardous waste management for PMU and PIDs.

MINIMUM REQUIRED QUALIFICATIONS

- The Consultant shall have a Bachelor's degree in environmental management, environmental sciences, civil engineering or any related field with at least 10 years' work experience.
- Master's degree will be an advantage
- Past experience in safeguards work in India, urban development sector and specifically on asbestos and hazardous waste management projects supported by multilateral agencies, international organizations or multinational firms is required.

MINIMUM EXPERIENCE

Minimum General Experience	10 Years
Minimum Specific Experience (relevant to assignment)	10 Years

¹ ULB = Urban Local Body; PWD = Public Work Departments

Standards for Sewage Treatment Plants (STPs)
 (Source: NGT (PB) Order dated 30.04.2019 in O.A. No. 1069/2018) ¹⁵⁷

Parameters	Standards (Applicable to all mode of disposal)			
	Mega and Metropolitan Cities	Class I Cities	Others	Deep Marine Outfall
pH	5.5 - 9.0	5.5 - 9.0	5.5 - 9.0	5.5 - 9.0
Bio-chemical Oxygen Demand (BOD)	10	20	30	30
Total Suspended Solids (TSS)	20	30	50	50
Chemical Oxygen Demand (COD)	50	100	150	150
Nitrogen-Total	10	15	-	-
Phosphorus-Total (For Discharge into Ponds, Lakes)	1.0	1.0	1.0	-
Fecal Coliform (FC) (Most Probable Number per 100 milliliter, MPN/100)	Desirable-100 Permissible-230	Desirable-230 Permissible-1000	Desirable-1000 Permissible-10,000	Desirable-1000 Permissible-10,000

Note:

- (i). Mega-Metropolitan Cities have population more than 1 crore, Metropolitan Cities-Population more than 10 Lakhs and Class-1 Population more than 1 Lakh.
- (ii). All value in mg/l except for pH and Fecal Coliform.
- (iii). These standards will be applicable for discharge into water bodies as well as for land disposal/applications.
- (iv). These Standards shall apply to all new STPs for which construction is yet to be initiated.
- (v). The existing/under construction STPs shall achieve these standards within 07 years from the date of notification.
- (vi). In case where the marine outfall provides a minimum initial dilution of 150 times at the point of discharge and a minimum dilution of 1500 times at a point 100m away from discharge point, then norms for deep sea marine discharge shall be applied.
- (vii). Reuse/Recycling of treated effluent shall be encouraged.
- (viii). State Pollution Control Boards/Pollution Control Committees may make these norms more stringent taking into account the local conditions

¹⁵⁷Reference: 2.1.6 Standards for Sewage Treatment Plants (STPs) from <https://tnpcb.gov.in/pdf/TNPCB&You2020.pdf>

GUIDELINES FOR REUSE OF TREATED EFFLUENT AND SLUDGE FROM STP FOR BENEFICIAL PURPOSES

(Source: Manual on Sewerage and Sewage Treatment Systems, CPHEEO, Ministry of Urban Development, Govt. of India)

Health Hazards during Sewage Operations

Labourers working on the sewage treatment and operations may suffer from a number of ailments directly attributed to handling of sewage. In view of this it is desirable to disinfect sewage and where feasible mechanize sewage operations.

The staff of sewage operations must be well educated in the sanitary rules on the utilization of sewage for irrigation as well as with personal hygiene. All persons working in sewage farms must undergo preventive vaccination against enteric infections and annual medical examination for helminthiasis and be provided treatment if necessary.

Sewage treatment plants should be provided with adequate space for canteens with proper sanitation, wash-stands and lockers for irrigation implements and protective clothing. Safe drinking water must be provided for the workers and for population residing within the effective range of the sewage treatment plants.

All workers should be provided with gum boots and rubber gloves, which must compulsorily be worn while at work. They should be forced to observe personal hygiene such as washing after work as well as washing before taking food. The use of antiseptics in the water used for washing should be emphasized. The farm worker should be examined medically at regular intervals and necessary curative measures enforced.

Mitigation measures to avoid Health Hazards

Personal Hygiene against Pathogen

The worker should take precautions because a large number of coliform groups, various kinds of micro-organisms, and egg parasites exist in sewage. The workers should strive to maintain good health by taking care of the following points:

- Wear clean uniform, work boots, etc.
- After work and before having a meal, always wash hands and disinfect them.
- After work, take a shower if possible.
- Do not enter the offices and lounges wearing dirty clothes.
- If necessary, take vaccinations against tetanus, leptospirosis fever and so on

Maintaining Cleanliness The worker should maintain each facility in a clean and neat condition.

- The floors of workrooms, stairs and corridors should be cleaned at the appropriate frequency to maintain them in a clean condition
- Disinfection of relevant locations is to be carried out periodically.

Health Check Workers should receive health check once a year to maintain their health, and prevent illnesses or detect them at an early stage. The results of the health check should be maintained as records. Recommended items to be inspected during the health check are as given below.

- Examine medical history.
- Examine subjective symptoms and other objective symptoms.

- Check height, weight, vision and hearing ability.
- Chest X-ray examination.
- Blood pressure measurement.
- Check for anaemia.
- Check for liver functions.
- Check for lipids in blood.
- Check blood sugar level
- Urine analysis.
- Electrocardiogram analysis

Welfare Measures The Sanitation Workers (Regulation of Employment and Conditions of Service) Act 2012 proposes constitution of a Sanitation Workers State Welfare Board to exercise powers conferred on it and to perform welfare functions such as the following for sanitation workers:

- Provide immediate assistance to a beneficiary in case of an accident
- Sanction of loan and advances.
- Medical expenses for treatment of major ailments
- Financial assistance for education of children
- Payment of maternity benefits
- Make provision and improvement of welfare measures and facilities as may be prescribed

Corrective Measures When a worker has symptoms of an illness listed above, the plant engineer should ensure that the worker is checked-up by a specialist doctor and receives proper treatment and care and should take the following actions considering the content of work done by the worker:

- Change the workplace if necessary
- Change the content of the work
- Shorten the working hours
- Perform relevant measurements of the working environment
- Maintain the facility or equipment

Risks in use of treated effluent and sludge in agriculture practices

Cultivation of crops that are eaten raw should be banned. Cultivation of paddy in bunded fields is likely to give rise to sanitation problems and hence is undesirable. Growing of non-edible commercial crops like cotton, jute, fodder, milling varieties of sugarcane and tobacco would be suitable. Cultivation of grasses and fodder legumes, medicinal and essential oil yielding plants like menthol and citronella may be allowed. Cultivation of cereals, pulses, potatoes and other crops that are cooked before consumption may be permitted, if sewage is treated and care is taken in handling the harvests to ensure that they are not contaminated. Cultivation of crop exclusively under seed multiplication programmes would be advantageous as these are not consumed. As an additional safeguard, sewage irrigation should be discontinued at least two months in advance of harvesting of fruits and berries, one month for all kinds of vegetables and a fortnight for all other crops. Direct grazing on sewage irrigated farms should be prohibited.

Risks of Nutrient Loading in Agriculture

Crops receiving excessive dosage of nitrogen show superfluous vegetative growth and decrease in grain or fruit yield. The phosphate deficit of sewage, therefore, should be made good by supplementing with phosphate fertilizers, the extent of phosphate fortification depending upon the nature of crop and its phosphate requirements. As the availability of

phosphate is low in the irrigation water it would be desirable to apply the required quantity of phosphatic fertilizer at the time or even (about a fortnight) before the sowing or planting of the crop. Even when sewage nutrients are balanced by fortification, irrigation with such sewage may supply excessive amount of nutrients resulting in waste or unbalanced growth of plants with adverse effects on yields. It may therefore be necessary to dilute the sewage. Dilution also helps in reducing the concentration of dissolved salts and decomposable organic matter in the sewage thus, decreasing hazards to the fertility of the soil. It is desirable to limit the BOD and total suspended solids of sewage to be disposed on land for irrigation, as per relevant standards. There is a need to take caution on describing nutrient supply capacity of sewage particularly in the case of availability of phosphorus because there is a possible conversion of available phosphorus in unavailable mode in the presence of heavy metals present in the sewerage. This happens commonly in high as well as low pH soils.

Alternative Arrangement during Non-irrigating Periods

During rainy and non-irrigating seasons, agricultural practices may not need any water for irrigation. Even during irrigating season, the water requirement fluctuates significantly. Hence, satisfactory alternative arrangements have to be made for the disposal of sewage on such occasions either by storing the excess sewage or discharging it elsewhere without creating environmental hazards. The following alternatives are generally considered: a) Provision of holding lagoons for off-season storage. They enable irrigation of a fixed area of land to varying rates of crop demand. They may also serve as treatment units such as aerated or stabilization lagoons, provided the minimum volume required for treatment is provided beyond the flow-balancing requirement. b) Provision of additional land where treated sewage is not required on the main plot of land c) Discharge of surplus treated sewage to river or into sea with or without additional treatment. Combining surface discharge facilities with irrigation system is quite common and often quite compatible. d) Resorting to artificial recharge in combination with an irrigation system where feasible.

Treated Sewage into Perennial Rivers

When sewage is treated and discharged into perennial flowing rivers and the blended river water is drawn downstream of the point of such blending as raw water for treatment in public water supply schemes. This is indirect potable use after blending. This is historical and ongoing all around. However, of late, the organic load due to the discharged treated, partially treated and non-point sewage becomes in excess of the self-purifying capacity of the river. Thus, the river water is not actually fresh water. The water quality of Yamuna river for Agra water supply scheme requires to be first treated in MBBR to purify the river water to a level as raw water for the downstream WTP. When it passes through flowing surface water it has the potential disadvantages of contamination by human and animal activities adding organic matter and waterborne pathogens unless the river stretch is protected from such activities. The guiding principle in such cases for the ULBs will be to at least intercept the sewage outfalls and provide adequate STPs and follow the recommended quality criteria for the treated sewage.

Treated Sewage into Non-Perennial / Dry River Courses

There are locations where the rivers are not perennial or almost dry throughout the year except some monsoon runoff. In this case the discharged treated sewage sinks into the aquifer zone and is extracted by infiltration wells or galleries. The advantage of direct dilution from surface water is lost, but the additional purification in the soil and dilution from the aquifer water are happening. An example is the case of the Palar river course in Tamilnadu. The surface water

flow in this occurs only for about a week if the monsoon is normal and if the water spills beyond the upstream impoundments. The aquifer however supports the public water supply of over 30 habitations along its dry tract of nearly 80 km before the sea. The partly treated sewage of the en-route habitations does reach this river course as intervals. So far, no epidemics have been met with. This may be due to the above said additional purification in the soil and dilution by aquifer water. However, if these are exceeded by the contamination load, there can be immediate health problems. The guiding principle in such cases for the ULBs will be (a) to keep a check on the raw water quality from the infiltration wells to detect sudden increase in contaminants and (b) at least intercept the sewage outfalls and provide adequate STPs.

ENVIRONMENT, HEALTH AND SAFETY AUDIT CHECKLIST AND SITE INVESTIGATION PROCEDURE - Template

1. BASIC INFORMATION

SUBSTATION DATA		List Responses Here	
1.1	Location / Address	District / Township:	Village:
1.2	Geographic coordinates		
1.3	Substation Plot (acres / hectares)		
1.4	Date substation was constructed / commissioned (year)		
1.5	List of major equipment / components at the substation Type of Substation (e.g. Hybrid, AIS, GIS) Capacity (MVA)	e.g. number of transformers; switch bay sets, etc	
1.6	Number of workers	Permanent:	Temporary:

2. OBSERVATIONS

SITE OBSERVATIONS		List Responses Here	
2.1	Description of substation within fenced boundary		
2.1 (a)	Adequate to undertake upgrade / extension / renovation works?		
2.2	Description of neighboring area / type of land use of surrounding area (outside the substation boundary) e.g. households, farm, warehouse yard, government building, barren / dense vegetation, vacant plot, agricultural fields, trees / forests, etc.		
2.3	List any sensitive natural and/or human receptors in close		

	proximity with distance in meters / km e.g. households, religious sites (pagodas, temples), schools, clinics, ponds, rivers, streams, trees / forests (including protected areas), etc.	
2.4	Any observed water logging at substation facility and/or surrounding areas	
2.5	Evidence of adequate fencing and other means of keeping the public and unauthorized persons away from the substation facility	
2.6	Evidence of leaks from existing transformers or other equipment / provision of oil pits	
2.7	Evidence of emergency planning e.g. Standard Operating Procedures (SOP) / Manual on Emergency Response Plan (ERP) on-site	
2.8	Evidence of safety signs , warning signs on-site.	
2.9	Evidence of fire-fighting equipment e.g. fire extinguishers, sand buckets, etc., (List numbers)	
2.10	Evidence of solid waste / hazardous waste management on-site	
2.11	Evidence of adequately sized drainage canals at the existing substation (This is to determine whether the drainage canals drain towards the road canal and/or towards adjoining areas and agricultural fields / vacant plots.)	
2.12	Evidence of adequate temporary storage space for new equipment /old and damaged equipment, materials on-site. (Also determine the condition of storage area e.g. permanent ('bunded') impermeable surface or temporary area)or directly on	

	ground	
2.13	Condition of approach road to substation facility, e.g. paved, unpaved, dusty, etc	

3. ISSUES INVESTIGATED DURING THE SITE VISITS

QUESTIONS FOR SITE ENGINEER		List responses here and ->		Remarks
	When was the substation first constructed / commissioned (year)? In general, check if substation facility was constructed prior to the Environmental Impact Assessment or equivalent regulations or after the regulations came into effect.)	Prior to EIA or equivalent regulations came into effect:	After EIA or equivalent regulations came into effect:	
	Was an environmental clearance obtained at the time of the initial planning of the substation facility?	Yes	No	Document available on site / to be requested from Regional office, date of effect:
	Was resettlement or compensation required at the time of the initial planning of the substation facility?	Yes	No	If Yes, describe procedures If No, describe why
	Were any external donors involved in the financing of the substation facility? (This is to determine if there were environmental assessment requirements from the donors.)	Yes	No	If Yes, documentation of requirements to be requested from Regional office, date of effect:
	Provide a layout plan of the substation facility, with dimensions (This is to determine the area of the substations and check for environmental issues such as drainage.)			Documentation of layout to be requested from Regional office

<p>What is the age of the transformers? How many transformers?</p> <p>(Answer will be used to judge the general condition of the substation facility, evidence of maintenance, and likelihood of the presence of older transformers containing PCBs¹ or other hazardous chemicals.)</p>			
<p>What are your procedures for servicing of the transformers?</p> <p>When was the transformer last serviced?</p> <p>What do you do with the used transformer oil?</p>			
<p>What type of circuit breakers do you use?</p> <p>(This is to determine if there are still sulphur hexafluoride (SF₆) circuit breakers with ceramic insulators at the substation which are more prone to breaking and explosion and release of SF₆ gas or with composite / rubber).</p>	Ceramic insulators:	Composite / rubber insulators:	
<p>Is there a written Environment, Health and Safety (EHS) plan on-site?</p>	Yes	No	Or where is it?
<p>Is there a written Emergency Response Plan (ERP) on-site?</p>	Yes	No	Or Where is it?
<p>Is training on Electrical works / Environment, Health and Safety / Emergency Response Plan done regularly?</p> <p>Is it quarterly, bi-annually or annually?</p> <p>(Please list type of training and number of times)</p>	Yes	No	If Yes, type of training and number of times:
<p>Did you or do you regularly</p>	Yes	No	If Yes, type of consultation

¹ PCB - Polychlorinated Biphenyl

	consultant with nearby communities on Environment, Health and Safety risks / Emergency Response Plan?			(formal / informal), when was it last done and number of times
	Do you conduct monitoring for Electro-magnetic fields (EMF)?	Yes	No	
	Describe your hazardous waste management procedures on-site. (This is to determine the measures on disposal of old batteries, transformers discarded / broken circuit breakers and other equipment)			
	Describe your solid waste management procedures on-site.			
	How do you handle any community complaints received?			
QUESTIONS FOR SITE STAFF / WORKERS				
	Have you participated in the Environment, Health and Safety training / Emergency Response Plan training? Are you aware of the Standard Operating Procedures for the substation?	Yes	No	If Yes, when
	Do you have adequate Personal Protective Equipment (PPE) such as helmets, gloves, boots, and eye and ear protection? Do you use them on daily basis?	Yes	No	
	Have there been any accidents in the substation facility that involved workers?	Yes	No	If Yes, when and details
	Have there been any accidents in the facility that involved the nearby community?	Yes	No	If Yes, when and details

	<p>Are there wild animals which enter or live in the substation facility?</p> <p>Do you have any issues with birds?</p>			
	<p>Are you aware of the grievance redress mechanism to address community complaints?</p>	<p>Yes</p>	<p>No</p>	

SUMMARY OF FINDINGS:

CORRECTIVE ACTION PLAN:
