

Environmental Assessment and Review Framework

Document Stage: Updated Draft
MFF Number: 0093-IND
Project Number: 48434-004
November 2022

India: Visakhapatnam-Chennai Industrial Corridor Development Program (Tranche 2)

Prepared by the Department of Industries, Government of Andhra Pradesh for the Asian
Development Bank.

CURRENCY EQUIVALENTS

(as of 17 November 2022)

Currency unit	–	India rupee/s (₹)
₹1.00	=	\$0.012
\$1.00	=	₹81.54

ABBREVIATIONS

ADB	–	Asian Development Bank
APPCB	–	Andhra Pradesh Pollution Control Board
APRDC	–	Andhra Pradesh Road Development Corporation
AP Transco	–	Andhra Pradesh Transmission Corporation
AE	–	Assistant Engineer
ASI	–	Archeological Survey of India
ASO	–	Assistant Safeguards Officer
CETP	–	Common Effluent Treatment Plant
CFE	–	Consent for Establishment
CFO	–	Consent for Operation
CGWA	–	Central Ground Water Authority
CPCB	–	Central Pollution Control Board
COVID19	–	Corona Virus Disease of 2019
EA	–	executing agency
EARF	–	environmental assessment and review framework
EAC	–	Expert Appraisal Committee
EC	–	Environmental Clearance
EIA	–	environmental impact assessment
SEIAA	–	State Environmental Impact Assessment Authority
EMP	–	environmental management plan
GOI	–	Government of India
GoAP	–	Government of Andhra Pradesh
GVMC	–	Greater Visakhapatnam Municipal Corporation
IA	–	implementing agency
IEE	–	initial environmental examination
PIU	–	Project Implementation Unit
PMU	–	Project Management Unit
MOEF	–	Ministry of Environment and Forest
MSWM	–	Municipal Solid Waste Management
NEP	–	National Environment Policy
NHAI	–	National Highways Authority of India
NOC	–	No Objection Certificate
NP	–	National Park
NPV	–	Net Present Value
PAM	–	project administration memorandum
PMSC	–	Project Management Consultant
PO	–	Project Officer
PPTA	–	project preparatory technical assistance
PWD	–	Public Works Department
APIIC	–	Andhra Pradesh Industrial Investment Corporation
REA	–	Rapid Environmental Assessment Checklist

RF	–	Resettlement Framework
ROW	–	right-of-way
SPS	–	Safeguard Policy Statement, 2009
STP	–	Sewage Treatment Plant
UNSECO	–	United Nations Educational, Scientific and Cultural Organization
VCIC	–	Vishakhapatnam Chennai Industrial Corridor
VCICDP	–	Vishakhapatnam Chennai Industrial Corridor Development Program
WLS	–	Wildlife Sanctuary

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, Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

CONTENTS

	Page
I. INTRODUCTION	1
A. Visakhapatnam-Chennai Industrial Corridor Development Program	1
B. Purpose of EARF	2
C. Project Components	3
II. ASSESSMENT OF LEGAL FRAMEWORK AND INSTITUTIONAL CAPACITY	4
A. Environmental Legislation (National and State Laws)	4
B. Government of India Environmental Assessment Procedures	12
C. International Environmental Agreements	13
D. ADB Policy	14
E. Assessment of Institutional Capacity	18
F. Lessons learnt from the previous ADB Projects implemented in India	20
III. ANTICIPATED ENVIRONMENTAL IMPACTS	22
IV. ENVIRONMENTAL ASSESSMENT FOR SUBPROJECTS AND/OR COMPONENTS	30
A. Environmental Criteria for Subproject Selection	30
B. Environmental Assessment Procedures for Projects	38
C. Review of Environmental Assessment Reports	41
V. CONSULTATION, INFORMATION DISCLOSURE, AND GRIEVANCE REDRESS	44
A. Public Consultation and Information Disclosure	44
B. Information Disclosure	45
C. Grievance Redress Mechanism	45
A. Grievance Redressal Committee	47
VI. INSTITUTIONAL ARRANGEMENTS AND RESPONSIBILITIES	49
A. Safeguard Implementation Arrangement	51
VII. INSTITUTIONAL CAPACITY AND DEVELOPMENT	59
B. Staffing and Budget	60
VIII. MONITORING AND REPORTING	64

APPENDICES

Appendix 1: List of Subprojects under Project 1 & 2	66
Appendix 2: Environmental Standards	67
Appendix 3: REA Checklists	75
Appendix 4: Outline of an ADB Environmental Assessment Report	92
Appendix 5: Outline of Due Diligence Report	95
Appendix 6: Records of Public Consultation	96
Appendix 7: Sample Annual Environmental Monitoring Report Template	97
Appendix 8: Construction Site Checklist for EMP Monitoring	102
Appendix 9: Sample Grievance Registration Form	104
Appendix 10: Sample IBAT report for subproject area	106
Appendix 11: Environment Safeguards QPR checklist	146
Appendix 12: Government order no GO.RT. No. 163 dated 08-06-2018 for establishment of Grievance	

Redressal Mechanism	147
Appendix 13: Health and Safety Plan VCICDP Project 2	149
Appendix 14: APIIC Note on CETP under Tranche-2	161

TABLES

Table 1: Subprojects and Components Under VCICDP	3
Table 2: Applicable Government of India Environmental Legislations and Specific Requirements	4
Table 3: International Agreements and Applicability to VCICDP	13
Table 4: Implementation Arrangements for VCICDP Project 2	18
Table 5: Lessons Learnt from past ADB Project implementation	20
Table 6: Anticipated Environmental Impacts for Subprojects	23
Table 7: Environmental Considerations in Subproject Selection	30
Table 8: Environmental Procedures for Project Processing	41
Table 9: PIU Environmental Safeguard Manager Tasks and Responsibilities	53
Table 10: Institutional Roles & Responsibility: Environmental Safeguards	56
Table 11: Training Program for Environmental Management	59
Table 12: Indicative Cost of EARF Implementation – Project 2	61

FIGURES

Figure 1: Grievance Redress Mechanism – Visakhapatnam–Chennai Industrial Corridor Development Program	47
Figure 2: VCICDP Implementation Arrangements	50
Figure 3: Safeguards Organogram – Visakhapatnam–Chennai Industrial Corridor Development Program	51

I. INTRODUCTION

A. Visakhapatnam-Chennai Industrial Corridor Development Program

1. Overview of the Program. The Asian Development Bank (ADB) approved on 20 September 2016 a multitranche financing facility (MFF) worth \$500 million and a policy-based loan (PBL) worth \$125 million for the Visakhapatnam-Chennai Industrial Corridor Development Program (VCICDP). ADB also approved on that day technical assistance (TA) worth \$1 million for Capacity Development for Industrial Corridor Management in Andhra Pradesh and, on 26 September 2016, ADB administration of a \$5 million grant from the Urban Climate Change Resilience Trust Fund under the Urban Financing Partnership Facility.

2. The VCICDP complements ongoing Government of Andhra Pradesh efforts to enhance industrial growth and create high-quality jobs. It has three outputs: (i) corridor management strengthened and ease of doing business improved, (ii) Visakhapatnam–Chennai Industrial Corridor (VCIC) infrastructure strengthened, and (iii) institutional capacity, human resources, and program management enhanced. The MFF and grant support priority infrastructure investments in the VCIC, and the PBL and TA support policy reform and institutional development in the state. The Department of Industries and Commerce (DOIC) of the Government of Andhra Pradesh is the MFF executing agency. The implementing units are Andhra Pradesh Industrial Infrastructure Corporation (APIIC), Transmission Corporation of Andhra Pradesh, Andhra Pradesh Road Development Corporation (APRDC), and Greater Visakhapatnam Municipal Corporation (GVMC).

3. **Impact and Outcome.** The impact of VCICDP will be an increased contribution of the manufacturing sector to the state's GDP, trade, and employment. The outcome will be enhanced growth and competitiveness of the VCIC. The Program-based Loan (PBL) will support policy reforms and institutional development in the state's industrial sector (Output 1); and the multitranche financing facility (MFF – two tranches) will support priority infrastructure investments in VCIC (Outputs 2 and 3). The VCICDP will develop two industrial clusters in the Visakhapatnam node—Rambilli and Nakapalli—and two clusters in the Srikalahasti–Chittoor node: Naidupeta and Chittoor–South.

4. **Outputs.** The outputs of VCICDP MFF are:

- (i) **Output 1:** Corridor management strengthened and ease of doing business improved. This will include (i) capacity development of institutions engaged in corridor management; (ii) a strategic road map and support to enhance the ease of doing business; (iii) an e-portal and a single-desk system for issuing business-related licenses, with incentives for women entrepreneurs; (iv) industrial and sector policies to stimulate industrial development, with special incentives for women; and (v) improvement in trade facilitation and logistics. Considering the demand for skilled workers across multiple sectors, the GoAP has committed to use part of the PBL to provide support for high quality content development for training institutions for skills development, and support to Andhra Pradesh State Skills Development Corporation (APSSDC) for training of workers and entrepreneurs every year.
- (ii) **Output 2:** VCIC infrastructure strengthened. This will include the development of internal roads, water supply, sewerage, and drainage in selected industrial clusters; (ii) roads for connectivity between industrial nodes, ports, and urban areas, and road safety measures; (iii) the power transmission and distribution system in the industrial corridor; and (iv) urban water supply in Visakhapatnam.

Output 3: Institutional capacities, human resources, and program management strengthened. This will include (i) establishment of project development facility; (ii) skills enhancement of workers and entrepreneurs, especially women; (iii) support for project management; and (iv) support for investor promotion.

5. **Tranches.**¹ The report and recommendation of the President for the MFF anticipated two tranches. ADB approved on 26 September 2016 a loan of \$245 million for project 1 under the first tranche of the MFF to (i) develop internal and external infrastructure of industrial clusters, (ii) strengthen electric power distribution capacity to meet industry demand, (iii) widen a section of a state highway to improve connectivity from the national highway to a port, and (iv) improve the water distribution network in Visakhapatnam for 24/7 supply. The second MFF tranche will enhance VCIC infrastructure, with a focus on prioritized industrial nodes in Visakhapatnam and the Srikalahasti–Chittoor. The Government of India also requested the extension of the MFF availability period from 30 June 2025 to 19 September 2026 to provide sufficient implementation period for packages proposed under the second tranche. The DOIC remains the executing agency of project 2, and APIIC and APRDC are the implementing agencies.

B. Purpose of EARF

6. In accordance with ADB's Safeguard Policy Statement (SPS), 2009 VCICDP requires an Environmental Assessment and Review Framework (EARF) to provide guidance on safeguard screening, assessment, institutional arrangements, and processes to be followed for components of the project, where design takes place after ADB Board approval. The subproject selection will be in accordance with the environmental project selection criteria as outlined in this EARF to ensure all subprojects under VCICDP will not deteriorate or interfere with the environmental sensitivity of a subproject area but rather improve environmental quality.

7. This EARF is prepared based on (i) ADB's SPS, 2009, and (ii) national and State of Andhra Pradesh environmental acts, rules, regulations, and standards and (iii) other applicable international rules, regulations and standards. It covers (i) the general anticipated impacts of subprojects likely to be financed under the facility on the environment, involuntary resettlement, and indigenous peoples; (ii) the safeguard criteria that are to be used in selecting projects; (iii) the requirements and procedure that will be followed for screening and categorization, impact assessments, development of management plans, public consultation and information disclosure, and monitoring and reporting; (iv) the institutional arrangements (including budget and capacity requirements) and government's and ADB's responsibilities and authorities for the preparation, review and clearance of safeguard documents is a guiding document during implementation. The executing agency will agree with ADB on screening and categorization, environmental assessment, preparation and implementation, monitoring, and updating existing safeguard plans to facilitate compliance with the requirements specified in ADB SPS, 2009 and government rules and laws.

8. The applicability and relevance of this EARF for Tranche 2 (Project 2) has been reviewed and accordingly updated to reflect Project 2 scope and consistency with all applicable laws and regulations in India and SPS, 2009. In the event that there is a discrepancy between the laws and regulations of India and ADB SPS, the ADB SPS will prevail.

9. Subproject selection, categorization, environmental assessment, implementation, monitoring, and reporting is required to follow the procedures outlined in this EARF. Any

¹ Project 1 and Project 2 correspond to Tranche 1 and Tranche 2 of the MFF respectively.

component included in VCICDP shall comply with Government of India environmental requirements and ADB SPS, 2009. All environmental documents will be endorsed by Department of Industries, Government of Andhra Pradesh and sent to ADB for approval and disclosure.

C. Project Components

10. Projects 1 and 2 are classified as category B for environmental safeguards. Table 1 shows sub-projects under VCICDP. No significant adverse environmental impacts that are irreversible, unprecedented or diverse are anticipated. All proposed subproject sites are located outside sensitive areas and any impacts during construction and operation can be avoided and/or mitigated through proper design and good high-quality construction and operations and maintenance practices.

Table 1: Subprojects and Components Under VCICDP

Component	Subprojects
Industrial infrastructure Enhancing / providing support infrastructure in industrial estates / SEZ's / start up areas of new industrial clusters	(i) Improvement of internal and external roads connectivity network; (ii) Construction of WTP/STP; (ii) Improvement in the industrial water supply and construction of common effluent treatment plan (CETP) construction ² (iii) Development of hazardous and solid waste management; (iv) Improvement in the power infrastructure, and (v) Beautification and development of green belt and other green areas.
Urban Investments: Water Sector Enhancing Urban infrastructure in towns / cities	(i) Rehabilitation of the water supply and distribution systems; (ii) Construction of water treatment plan (WTP) and/or sewage treatment plant (STP)
Investment in connectivity-Roads State road widening / strengthening for enhanced and better connectivity to national highway / ports	(i) Conversion to four lane from double lane; (ii) Conversion to double lane from single lane; (iii) Strengthening of existing road; (iii) Construction of road over bridge (ROB) / road under bridge (RUB) / Culverts / drainage line along the existing road; and (iv) Road maintenance activities including but not limited to activities such as sweeping of shoulders, roadside railing repair, centerline painting, small bridge deck replacement, road lighting improvements, culvert rehabilitation to pavement strengthening and replacement of both the subgrade and pavements for section of roads of varying length.
Investment in Power Sector Construction of substations / power transmission and distribution lines in industrial area / city Transmission and distribution network improvements	(i) Construction and/or upgrading of substations; and (ii) Installation and/or upgrading of transmission towers, poles and stringing of conductors

11. In Project 1, ten (10) subprojects are being implemented for which IEEs with EMPs have been prepared and uploaded at the ADB and Project Websites. The IEEs and EMPs formed part

² For Project 1 subproject – Construction of 1MLD Common Effluent Treatment plant (CETP) at Naidupeta Industrial cluster; The CETPs/STPs under Project 2 shall be constructed for the proposed Industrial parks by the GoAP and are not a part of the ADB funded start up areas (Refer Appendix 15)

of the bid and contract documents and the EMP implementation is being monitored and reported in the SEMRs prepared and submitted to ADB for disclosure.

12. Seven draft initial environmental examination (IEEs) with environmental management plans (EMPs) are prepared for VCICDP Tranche 2 processing corresponding to Industrial Infrastructure and connectivity roads subprojects³ in accordance with SPS, 2009, and government laws. Accordingly, the potential environmental impacts are mainly related to the construction period, which can be minimized by mitigating measures and environmentally-sound engineering and construction practices. Various design and location aspects are already integrated in planning and feasibility/design of subprojects to minimize / mitigate operational stage impacts. Mitigation and monitoring measures are included in EMPs the of IEEs.

II. ASSESSMENT OF LEGAL FRAMEWORK AND INSTITUTIONAL CAPACITY

A. Environmental Legislation (National and State Laws)

13. Implementation of VCICDP will be governed by environmental acts, rules, policies, and regulations of the Government of India. These regulations impose restrictions on the activities to minimize/mitigate likely impacts on the environment. Many of these are cross sector and several of them are directly related to environmental issues. The most important of these is the “Environmental Impact Assessment (EIA) Notification, 2006”.

14. In addition to the EIA Notification 2006, there are a number of other acts, rules and regulations currently in force that could apply to VCICDP. Salient features and applicability of these legislations are provided in Table 2. This presents specific requirements for the project. Appendix 2 provides the environmental standards for air, surface water, groundwater, emissions, noise, vehicular exhaust and disposal to land/agricultural use of sludge and bio-solids.

Table 2: Applicable Government of India Environmental Legislations and Specific Requirements

No.	Legislation	Requirements for the Project	Applicability
1	National Environment Policy (NEP), 2006	Project should adhere to the NEP principle of enhancing and conservation of environmental resources and abatement of pollution	The policy governing the environmental rules and legislations and is applicable to all the subprojects.
2	EIA Notification, 2006	Environmental clearances (EC)	EIA study and EC is required for the following components proposed under the project: <ul style="list-style-type: none"> • Development of industrial clusters including startup areas • Construction of CETP/STP/WTP The proposed component of the water supply, power distribution network,

³ 7 Draft IEEs were prepared for Project 2 subprojects covering (i) start up areas in Chittoor, Nakapalli and Rambilli Industrial clusters; (ii) Atchuthapuram and Anakapalli road and (ii) connectivity roads for these industrial clusters.

No.	Legislation	Requirements for the Project	Applicability
			transmission lines and road construction do not require Environmental Clearance.
3	Water (Prevention and Control of Pollution) Act, 1974 amended 1988 and its Rules, 1975	<ul style="list-style-type: none"> • Consent for establishment (CFE) and consent for operation (CFO) from APPCB • Compliance to conditions and disposal standards stipulated in the CFE and CFO 	Applicable to all the subproject specifically for the construction and operation of sewage treatment plant and CETP under Tranche-1
4	Air (Prevention and Control of Pollution) Act, 1981, amended 1987 and its Rules, 1982	<ul style="list-style-type: none"> • CFE and CFO from APPCB as applicable • Compliance to conditions and emissions standards stipulated in the CFE and CFO. 	For the subproject, the following will require CFE and CFO: (i) diesel generators; (ii) hot mix plants; and (iii) vehicles emitting air pollutants.

No.	Legislation	Requirements for the Project	Applicability
5	<p>Environmental (Protection) Act, 1986 amended 1991 and the following rules/notifications:</p> <ul style="list-style-type: none"> • Environment (Protection) Rules, 1986 including amendments • Municipal Solid Wastes (Management and Handling) Rules, 2000 • Noise Pollution (Regulation and Control) Rules, 2000 • Environmental Standards of Central Pollution Control Board (CPCB) • Notification of Eco Sensitive Zones • Wetland (Conservation and Management) Rules, 2010 • Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2009 	<ul style="list-style-type: none"> • CETPs/STPs⁴ should be designed and operated to meet disposal standards. Inlet effluent at CETP should also meet the standards - compliance with emission and disposal standards during construction. • Solid waste and sludge generated at proposed facilities shall be disposed in accordance with the MSWM Rules. • Compliance with noise standards • Compliance to environmental standards (discharge of effluents) • Restriction of activities (including construction, tree cutting, etc.) in the notified zones. There are no eco sensitive zones in or near the subproject locations • Applies to protected wetlands (Ramsar sites, wetlands in eco sensitive areas and UNESCO heritage sites & in high altitudes, and wetlands notified by Government of India) - Prohibits/ regulates activities within and near the wetlands. None of the subproject locations has protected wetlands • Rules defines and classifies hazardous waste provides procedures for handling hazardous waste • Requires Pollution Control Board's consent for handling hazardous waste • Procedure for storage of 	Applicable to all subprojects

⁴ For the CETPs/STPs under Project -2 which are proposed to be implemented by the GoAP shall ensure that all compliances specified under the MoEFCC and APPCB requirements are followed.

No.	Legislation	Requirements for the Project	Applicability
		<p>Hazardous wastes and provides procedures for recycling, reprocessing or reuse, import and export of hazardous waste</p> <ul style="list-style-type: none"> Rules for development of treatment, storage, disposal facility (TSD) for hazardous wastes such that TSD shall be developed following guidelines issued by CPCB 	
6	Indian Wildlife (protection) Act, 1972 amended 1993 and Rules 1995 Wildlife (Protection) Amendment Act, 2002	<ul style="list-style-type: none"> Covers wildlife sanctuaries, national parks, biosphere reserves, etc. Specifies required permission from Chief Wildlife Warden/ State Wildlife Board/National Board of Wildlife 	Applicable to subprojects located within core or buffer zone of protected areas. However, Tranche 1 subprojects are not located in or adjacent to any protected areas. Applicability to Tranche 2 subprojects will be assessed during preparation of periodic financial request.
7	<p>Indian Forest Act, 1927</p> <ul style="list-style-type: none"> Forest (Conservation) Act, 1980 amendment 1988 and the following rules/notifications Forest (Conservation) Rules, 1981 amended 1992 and 2003 Guidelines for diversion of forest lands for non-forest purpose 	<ul style="list-style-type: none"> Declaration of forest areas (reserved, protected and village forests), and regulation of activities within the forests Restricts use of forest lands for non-forest purposes; Prior permission for use of forest land for project proposes from Ministry of Environment and Forest (MoEF) Approval of Ministry of Environment and Forest (MoEF) for any acquisition of forest land Application for use of forest of land to be made to Forest Department, GoAP Project proponent to identify non-forest land which is to be transferred to Forest Department for taking up afforestation program. Net Present Value (NPV) of the forest land to be used, cost of afforestation, tree cutting, etc., as determined by Forest 	Applicable to all subprojects located in forest lands. Subproject located in forests requires prior permission to take up the works.

No.	Legislation	Requirements for the Project	Applicability
		Department, is to be paid to the Forest Department.	
8	Ancient Monuments and Archaeological Sites and Remains Acts, 1958, its Rules, 1959 and notification, 1992	<ul style="list-style-type: none"> No excavation/construction work is allowed within 300 m boundary of the protected monument Requires prior permission of Archaeological Survey of India (ASI) for taking works within 500 m of boundary of the Protected Monuments 	Applicable to subprojects located in proximity of protected monuments/sites
9	Contract Labour (Regulation and Abolition) Act, 1970; <ul style="list-style-type: none"> The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979 	<ul style="list-style-type: none"> Department of Labour, GoAP as principle employer Contractor shall register with Labour Department, GoAP if inter-state migrant workmen are engaged Adequate and appropriate amenities and facilities shall be provided to workers including housing, medical aid, traveling expenses from home and back, etc., 	<ul style="list-style-type: none"> Applicable to all construction/civil works. PIUs to obtain Certificate of Registration. Contractors to obtain license from designated labour officer
10	The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and the Cess Act of 1996	<ul style="list-style-type: none"> Cess should be paid at rate not exceeding 2% of the cost of construction as may be notified The employer is required to provide safety measures at the building or construction work and other welfare measures, such as canteens, first-aid facilities, ambulance, housing accommodation for workers near the workplace etc. The employer has to obtain a registration certificate from the Registering Officer 	Applicable to any building or other construction work and employ 10 or more workers
11	The Child Labour (Prohibition and Regulation) Act, 1986	<ul style="list-style-type: none"> No child below 14 years of age will be employed or permitted to work in all the subprojects. 	No child below 14 years of age will be employed or permitted to work in all the subprojects.
12	Minimum Wages Act, 1948	<ul style="list-style-type: none"> All construction workers should be paid not less than the prescribed minimum wage 	Applicable to all subprojects.
13	Workmen Compensation Act, 1923	<ul style="list-style-type: none"> Compensation for workers in case of injury by 	Applicable to all subprojects.

No.	Legislation	Requirements for the Project	Applicability
		accident	
14	Equal Remuneration Act, 1979	<ul style="list-style-type: none"> Equal wages for work of equal nature to male and female workers 	Applicable to all subprojects.
15	AP State Environment Policy	<ul style="list-style-type: none"> Follows the National Environment Policy, 2006 Project implementation should adhere to the policy aims 	Applicable to all subprojects.
16	The Motor Vehicles Act, 1988	<ul style="list-style-type: none"> 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. All the vehicles that will be used in construction of the subprojects will have to comply with the PUC norms set down under this act. 	Applicable to all subprojects.
17	Coastal Regulation Zone (CRZ) Notification 6th January 2011 <ul style="list-style-type: none"> Central Government have declared the coastal stretches of seas, bays, estuaries, creeks, rivers and back waters which are influenced by tidal action (in the landward side) up to 500m from the High Tide Line (HTL) and the land between the Low Tide Line (LTL) & High Tide Line (HTL) as "Coastal Regulation Zone" (CRZ), as per the provisions of the CRZ Notification 6th January 2011. 	<p>The main objectives of the Coastal Regulation Zone Notification, 2011 are:</p> <ul style="list-style-type: none"> to ensure livelihood security to the fishing communities and other local communities living in the coastal areas; to conserve and protect coastal stretches and; to promote development in a sustainable manner based on scientific principles, taking into account the dangers of natural hazards in the coastal areas and sea level rise due to global warming. 	Not applicable for ADB funded start-up areas as no subproject activities shall be conducted in CRZ areas.
18	Minor Mineral and concession Rules	For opening new quarries. Regulate use of minor minerals like stone, soil, river sand etc.	Applicable to all subprojects.
19	The Mining Act (1952)	The mining act has been notified for safe and sound mining activity. The	Applicable to all subprojects.

No.	Legislation	Requirements for the Project	Applicability
		construction of road subprojects will require aggregates. These will be procured through mining from riverbeds and quarries	
20	Notification for use of fly ash from thermal power plants within 100km reaches of the project.	The MoEF had issued in 2009 a notification that all brick units within 100km radius of thermal power plants were required to use fly ash for making bricks as well as using it for construction activities like building or roads.	Applicable to all subprojects within 100km reaches of thermal power plants.
21	Public Liability and Insurance Act 1991	Protection from hazardous materials and accident.	Applicable to all subprojects.
22	National Environment Appellate Authority Act (NEAA) 1997	Grievances process and how they will be dealt with.	Applicable to all subprojects.
23	Explosive Act 1984 - For transporting and storing diesel, bitumen etc.	Safe transportation, storage and use of explosive material.	Applicable to all subprojects.
24	The Factories Act, 1948 - The Andhra Pradesh Factory Rules	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.	Applicable to all subprojects.
26	Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996.	The Rules provide for mandatory preparation of On-Site Emergency Plans by the industry and Off-Site Plans by the district collector and the constitution of four tier crisis groups at the center, district, and local levels for the management of chemical disaster.	Applicable to all subprojects.
27	Permission for extraction of ground water for use in road construction activities from State Ground Water Board.	Extraction of groundwater.	Applicable to rehabilitation and improvement of water supply. To be obtained prior to initiation of any work involving abstraction of groundwater
28	Permission for use of water for construction purpose from irrigation department	Use of surface water for construction	Applicable to all subprojects. To be obtained prior to initiation of any work involving use of surface water for construction

No.	Legislation	Requirements for the Project	Applicability
29	Construction and Demolition Waste Management Rules 2016	<p>(i) Every waste generator shall segregate construction and demolition waste and deposit at collection Centre or handover it to the authorized processing facilities</p> <p>(ii) Shall ensure that there is no littering or deposition so as to prevent obstruction to the traffic or the public or drains.</p> <p>(iii) Large generators (who generate more than 20 tons or more in one day or 300 tons per project in a month) shall submit waste management plan and get appropriate approvals from the local authority before starting construction or demolition or remodeling work,</p> <p>(iv) Large generators shall have environment management plan to address the likely environmental issues from construction, demolition, storage, transportation process and disposal / reuse of C & D Waste.</p> <p>(v) Large generators shall segregate the waste into four streams such as concrete, soil, steel, wood and plastics, bricks and mortar,</p> <p>Large generators shall pay relevant charges for collection, transportation, processing and disposal as notified by the concerned authorities;</p>	Contractor to follow all the rules during construction works
30	COVID 19 prevention and control guidelines (GOI / GoAP / ADB Guidelines on COVID 19)	<p>Construction sites operating during the Covid-19 pandemic need to ensure they are protecting their workforce and minimizing the risk of spread of infection.</p> <ul style="list-style-type: none"> • This guidance is intended to introduce consistent measures on sites of all sizes in line with the Government's recommendations on social distancing. • For these exceptional circumstances the project must remain abreast of and comply with the latest Government advice on COVID-19 at all times. 	<p>Applicable to all subproject sites</p> <p>VCICDP H&S plan for COVID19 prevention and control to be implemented and monitored.</p>

15. Subprojects in forest lands will be avoided. However, in unavoidable cases like non-availability of suitable non-forest lands, water supply rising mains/trunks mains traversing forest lands and power distribution lines passing through any designated forest area, the forest land conversion will follow the “Guidelines for Diversion of Forest Lands for Non-Forest Purpose” under Forest (Conservation) Act, 1980.⁵ The proposal for conversion and compensatory afforestation should be submitted by project proponent to Forest Department, Government of Andhra Pradesh which will then forward it to the MoEF for approval. The following guidelines will be adhered to in the process:

- (i) An equivalent area of non-forest land will be made available for afforestation
- (ii) As far as possible, the non-forest land for compensatory afforestation should be identified contiguous to or in the proximity of a reserved Forest or protected forest. If non-forest lands are not available in the same district other non-forest land may be identified elsewhere in the state.
- (iii) Where non-forest lands are not available, compensatory afforestation may be carried out over degraded forest twice in extent to the area being diverted.

16. In Andhra Pradesh State, there are two national parks (NP) and 21 wildlife sanctuaries (WLS). None of these protected areas are located in the vicinity of the subproject locations.

17. Cutting of trees in non-forest land, irrespective of land ownership, also requires permission from local administration. Afforestation to the extent of two trees per each tree felled is mandatory.

B. Government of India Environmental Assessment Procedures

18. The EIA Notification, 2006, sets out the requirement for environmental assessment in India. This states that prior environmental clearance (EC) is mandatory for the development activities listed in its schedule and 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 EC from MoEF. The proponent is required to provide preliminary details of the project in the prescribed form, after which an Expert Appraisal Committee (EAC) of the MoEF prepares comprehensive terms of reference (ToR) for the environmental impact assessment (EIA) study within 60 days. On completion of the study and review of the report by the EAC, MoEF considers the recommendation of the EAC and provides the EC if appropriate.
- (ii) Category B projects require EC from the State Environment Impact Assessment Authority (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 EAC, the SEIAA issues the EC based on the EAC recommendation. The Notification also provides that any project or activity classified as category B will be treated as category A if it is located in whole or in part within 10 km from the boundary of protected areas, notified areas or inter-state or international boundaries.

⁵ (i) Forest land involving up to 5 hectares (ha) will be cleared by MoEF Regional Office; and (ii) Forest land involving more than 5 ha and up to 40 ha will be cleared by the MoEF Regional Office after referring the case to Central MoEF

19. Of the 7 subprojects proposed under Project 2, 3 subprojects related to industrial infrastructure development in startup areas of industrial clusters require EC. Four road connectivity subprojects do not fall under the ambit of EIA Notification, 2006, and therefore EC is not required. For one subproject, EC has already been obtained, and for remaining two it is under process. The startup areas, in which infrastructure development is proposed under Project 2, are part of larger industrial clusters being developed by APIIC (IA), and EIA study and EC being obtained for entire industrial cluster, including startup areas. APIIC has already secured EC on November 11, 2020 for Chittoor industrial cluster and EC for industrial clusters in Rambili and Nakkapalli is in the process and expected to be obtained by March 2023.

C. International Environmental Agreements

20. India is a party to the following international convention that may apply to this project, especially in selection and screening of subprojects under restricted/sensitive areas.

Table 3: International Agreements and Applicability to VCICDP

No.	Agreement	Requirements for the Project
1	<p>Ramsar Convention on Wetlands of International Importance, 1971.</p> <p>The Convention on Wetlands of International Importance, called the 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 designated wetlands in India which are required to be protected.</p>	<p>There is one Ramsar Site⁶ in Andhra Pradesh however it is not located within or adjacent to the any of the project sites. If in future any of the activities are undertaken in the proximity of Ramsar wetlands, shall follow the guidelines of the convention (The Ramsar Convention Handbooks for the wise use of wetlands, 4th ed. (2010), (http://www.ramsar.org/cda/en/ramsar-pubshandbooks/main/ramsar/1-30-33_4000_0_))</p>
2	<p>Convention on the Transboundary Movements of Hazardous Wastes and Their Disposal, 1989</p> <p>To protect human health and the environment against the adverse effects of hazardous wastes. This aims at (i) reduction of hazardous waste generation, promotion of environmentally sound management (ii) restriction of transboundary movements, and (iii) a regulatory system for transboundary movements.</p>	<p>Sludge/rejects generated from tertiary treatment process likely to have heavy metals and may fall in hazardous waste category. The sludge/rejects will be disposed within the country, and therefore will not attract this convention. This will be disposed in an existing hazardous waste management facility, known as Treatment, Storage and Disposal Facility (TSDF) located close to respective industrial cluster.</p>
3	<p>Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris 1972)</p>	<p>This Convention defines and provides for the conservation of the world's heritage by listing the natural and cultural sites whose value should be preserved. Not applicable for Project 1 and Project 2 subprojects. Site selection for the succeeding tranche can refer to the existing list, if available, to avoid impacts in areas with cultural and natural heritage value.</p>

⁶ Kolleru Lake.

No.	Agreement	Requirements for the Project
4	Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington 1973) – also known as CITES was signed on 20 November 1981.	This Convention provides a framework for addressing the overharvesting and exploitation patterns that threaten species of flora and fauna. Under the Convention, the governments agree to restrict or regulate trade in species that are threatened by unsustainable
		patterns. Not applicable for Project 1 subprojects. The succeeding tranche will ensure that the same will not cause any harvesting and exploitation of wild flora and fauna during construction and operation.
5	Convention on Biological Diversity (1992)	This provides for a framework for biodiversity and requires signatories to develop a National Biodiversity Strategy and Action Plan. Not applicable for Project 1 subprojects. The succeeding tranche will refer to the applicable National Biodiversity Strategy and Action Plan in selecting the project sites and that any replacement to cleared vegetation resulting from the project will be consistent with the objectives and priorities of the Action Plan.
6	Convention on the Conservation of Migratory Species of Wild Animals (Bonn 1979)	This sets the framework for agreements between countries important to the migration of 8 threatened species. Not applicable for Project 1 subprojects. Selection of sites for succeeding tranche will avoid areas known to be habitat of migratory species of wild animals.
7	United Nations Framework Convention on Climate Change (UNFCCC), 1993	<p>The UNFCC is an international environmental treaty with the main objective to stabilize greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system.</p> <p>India signed the UNFCC on 10 June 1992 and ratified it on 1 November 1993. The project will ensure that all construction activities will not significantly increase the GHG emissions and ensure that design of all infrastructure are resilient climate change impacts</p>

D. ADB Policy

21. ADB requires the consideration of environmental issues in all aspects of ADB's operations, and the requirements for environmental assessment are described in ADB SPS, 2009. This states that ADB requires environmental assessment of all ADB investments.

22. **Screening and categorization.** The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type

and location of the project; the sensitivity, scale, nature, and magnitude of its potential impacts; and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impacts, and are assigned to one of the following four categories:

- (i) **Category A.** Projects could have significant adverse environmental impacts. An EIA is required to address significant impacts.
- (ii) **Category B.** Projects could have some adverse environmental impacts, but of lesser degree or significance than those in category A. An IEE is required to determine whether significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.
- (iii) **Category C.** Projects are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are reviewed.
- (iv) **Category FI.** Projects involve a credit line through a financial intermediary or an equity investment in a financial intermediary. The financial intermediary must apply an environmental management system, unless all projects will result in insignificant impacts.

23. ADB Rapid Environmental Assessment (REA) Checklists will be used for the screening and categorization.

24. **Environmental audit.** For subprojects involving facilities and/or business activities that already exist or are under construction, environmental audit including an on-site assessment to identify past or present concerns related to impacts on the environment will be undertaken. The objective of this environmental audit is to determine whether actions were in accordance with ADB's safeguard principles and requirements for borrowers/clients, and to identify and plan appropriate measures to address outstanding compliance issues. Where non-compliance is identified, a corrective action plan agreed by ADB, executing agency and implementing agencies will be prepared. The plan will define the necessary remedial actions, the budget for such actions, and the timeframe for resolution of non-compliance. The environmental audit report (including the corrective action plan, if any) will be made available to the public in accordance with the information disclosure requirements of ADB SPS.

25. **Natural,⁷ Modified⁸ or Critical Habitat.⁹** ADB SPS 2009 does not allow implementing subproject activities in areas of critical habitats or in areas that would lead to significant conversion and degradation of natural / modified habitats.¹⁰ A precautionary approach shall be applied to

⁷ Natural 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

⁸ Modified habitat is where natural habitat has apparently been altered, often through introduction of alien species of plants and/or animals;

⁹ Critical 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.

¹⁰ Significant 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

management and use of renewable natural resources. Global database such as the Integrated Biodiversity Assessment Tool (IBAT) will be used to conduct preliminary assessment on the site locations in reference to critical habitats, key biodiversity and key protected areas alongside the IUCN red list of species affected – critically endangered, endangered, endemic or restricted-range.

26. Physical Cultural Resources. ADB SPS 2009 defines Physical Cultural Resources as movable or immovable objects, sites, structures, groups of structures and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be in urban or rural settings and may be above or below ground or under water. Their cultural interest may be at the local, provincial, national, or international level.

27. Pollution Prevention and Abatement. During the design, construction and operation of the project the executing and implementing agencies will apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the International Finance Corporation's (IFC) Environmental, Health and Safety (EHS) Guidelines.¹¹ These standards contain performance levels and measures that are normally acceptable and applicable to projects. When Government of India regulations differ from these levels and measures, the EA/IAs shall achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the EA/IAs will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS, 2009.

28. Occupational Health and Safety. DOI/PMU/PIUs shall ensure that workers are provided with a safe and healthy working environment, considering risks inherent to the sector and specific classes of hazards in the project work areas, including physical, chemical, biological, and radiological hazards. DOI/PMU/PIUs shall ensure to take steps to prevent accidents, injury, and disease arising from, associated with, or occurring during the course of work by (i) identifying and minimizing, so far as reasonably practicable, the causes of potential hazards to workers; (ii) providing preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances; (iii) providing appropriate equipment to minimize risks and requiring and enforcing its use; (iv) training workers and providing them with appropriate incentives to use and comply with health and safety procedures and protective equipment; (v) documenting and reporting occupational accidents, diseases, and incidents; and (vi) having emergency prevention, preparedness, and response arrangements in place. DOI/PMU/PIUs shall also adhere to necessary protocols¹² in response to emerging infectious diseases such as the corona virus disease (COVID-19) consistent with the guidelines of relevant government healthcare agencies and the World Health Organization. PMU/PIUs will screen asbestos in new construction materials and demolition wastes following ADB's Good Practice Guidance for the Management and Control of Asbestos (March 2022)¹³ or other international best practices in handling asbestos.

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 tree plantations); permanent flooding (by a reservoir for instance); drainage, dredging, filling, or canalization of wetlands; or surface mining;

¹¹ https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/ehs-guidelines

¹² Refer Appendix 13 -VCICDP Health and Safety Plan with COVID-19 Precautions

¹³ <https://www.adb.org/sites/default/files/publication/783636/good-practice-management-control-asbestos.pdf>

29. **Community Health and Safety.** DOI/PMU shall ensure to identify and assess the risks to, and potential impacts on, the safety of affected communities during the design, construction, operation, and decommissioning of the project, and will establish preventive measures and plans to address them in a manner commensurate with the identified risks and impacts.

30. **Prohibited investment activities.** Pursuant to ADB's Safeguard Policy Statement (2009), ADB funds may not be applied to the activities described on the ADB Prohibited Investment Activities List set forth at Appendix 5 of the Safeguard Policy Statement (2009).

31. **Environmental Management Plan.** An EMP, which addresses the potential impacts and risks identified by the environmental assessment, shall be prepared. The level of detail and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the project's impact and risks.

32. **Public disclosure.** ADB will disclose acceptable reports received and endorsed by the PMU on ADB website so affected people, other stakeholders, and the public can provide meaningful inputs into the subproject design and implementation:¹⁴

- (i) for environmental category A projects, draft EIA report at least 120 days before Board consideration;
- (ii) EARF;
- (iii) final or updated EIA and/or IEE upon receipt;
- (iv) Environmental monitoring reports submitted by the Project Management Unit (PMU) during project implementation upon receipt, and
- (v) Corrective action plans, if any

33. **Consultation and Participation.** Meaningful consultation shall be carried out with affected people and other concerned stakeholders including civil society and facilitate their informed participation. The consultation process and its results are to be documented and reflected in the environmental assessment report.

34. **Grievance Redress Mechanism.** EA/IAs shall establish a mechanism to receive and facilitate resolution of affected people's concerns, complaints and grievances about the subproject's environmental performance. The grievance mechanism shall be scaled to the risks and adverse impacts of the subproject.

35. **Monitoring and Reporting.** PMU shall monitor measure and document the progress of implementation of the EMP. If necessary, PMU will identify the necessary corrective actions, and reflect them in a corrective action plan. PMU will prepare and submit to ADB semi-annual environmental monitoring reports during the construction phase, and annual environmental monitoring reports during the operation and maintenance phase that describe progress with implementation of the EMP and compliance issues and corrective actions, if any. Reporting will continue until ADB issues a completion report for the project.

¹⁴ Per ADB SPS, 2009, prior to disclosure on ADB website, ADB reviews the "borrower's/client's environmental assessment reports and plans to ensure that safeguard measures are in place to avoid, wherever possible, and minimize, mitigate, and compensate for adverse and environmental impacts in compliance with ADB's safeguard policy principles and Safeguard Requirements 1."

E. Assessment of Institutional Capacity

36. **Implementation Arrangement.** The implementation arrangements are summarized in Table 4. The Department of Industries (DOI) is the executing agency. A program management unit (PMU) is established within the Directorate of Industries, which is under the DOI, for planning, implementation, monitoring and supervision, and coordination for both the PBL and MFF. Project implementation units (PIUs), established in Andhra Pradesh Industrial Infrastructure Corporation (APIIC); Andhra Pradesh Road Development Corporation (APRDC); Greater Visakhapatnam Municipal Corporation (GVMC); and AP Transco, will be responsible for implementing the MFF. The PMU has recruited consulting firms—project management and supervision consultant (PMSC), and other consultants in accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). Procurement of civil works and goods are carried out in accordance with ADB's Procurement Guidelines (2015, as amended from time to time). Project 2 will follow same arrangements as established in Project 1.

Table 4: Implementation Arrangements for VCICDP Project 2

Table 4: Implementation Arrangements for VCICDP - Project 2			
Aspects	Arrangements		
Implementation period	March 2023-2026		
Estimated completion date	19 March 2026		
Estimate loan closing date	19 September 2026 (MFF availability period: 19 September 2026 (to be confirmed))		
Management			
(i) Oversight body	A program steering committee, chaired by the chief secretary with representatives of key collaborative agencies, will provide policy direction and oversee implementation.		
(ii) Executing agency	Department of Industries and Commerce, Government of Andhra Pradesh		
(iii) Implementing agency	APIIC and APRDC		
(iv) Implementation arrangement	The Department of Industries and Commerce has established a program management unit for planning, implementation, monitoring and supervisions of the VCICDP. Project implementation units established in APIIC and APRDC are established to implement the concerned sub-projects.		
Procurement	Open competitive bidding	7 contracts	\$158.0 million
Consulting services	The consultants engaged under Project 1 will support the executing agency and implementing agencies in project management and supervision of Project 2.	844 person-months	\$4.8 million
Retroactive financing and advance contracting	Advance contracting and retroactive financing is used for eligible expenditures incurred for (i) civil works and (ii) consulting services. Retroactive financing will be considered for up to 20% of the loan amount for eligible expenditures incurred before loan effectiveness, but not earlier than 12 months before the signing of the loan agreement.		
Disbursement	Disbursement of the loan proceeds will follow ADB's <i>Loan Disbursement Handbook</i> (2017, as amended from time to time) and detailed arrangements agreed upon between the government and ADB.		

ADB = Asian Development Bank, APIIC = Andhra Pradesh Industrial Infrastructure Corporation, APRDC = Andhra Pradesh Road Development Corporation, MFF = multitranché financing facility, PMSC = project management and construction supervision consultant, VCICDP = Visakhapatnam–Chennai Industrial Corridor Development Program.
Source: Asian Development Bank.

37. DOI is responsible for overall strategic planning, guidance and management of the VCICDP, and for ensuring compliance with conditions and loan covenants responsible. The PMU will be responsible for planning, implementation, monitoring and supervision, and coordination of all activities under the Program and the MFF.

38. In the current institutional set up, environmental safeguard related functions are housed within the department's organizational set-up and are handled by the respective project officers (Environment). There is no safeguards division set-up at PMU level, and all the safeguard related activities are directly handled by concerned departments. Project officers in the departments will be assisted by specialist consultants in all safeguards related activities - preparation of environmental documents, obtaining regulatory clearances, implementation and monitoring of Environmental Management Plans (EMPs), etc.

39. The implementing agencies will be responsible for preparing environmental impact assessment (EIA) or initial environmental examination (IEE) reports, monitoring of safeguards issues, providing support and guidance for performance criteria and development planning.

40. At present, the capacity to handle environmental safeguard related tasks at department level is available in APRDC and APIIC. During the implementation of VCICDP, PIUs will be supported by specialist consultants for management and monitoring of environmental safeguards implementation. During the operation phase, subproject operation will be monitored by APPCB.

41. To comply with ADB SPS 2009, the executing and implementing agencies of the project need to have a sustained capacity to manage and monitor environmental safeguards. Therefore, the executing and implementing agencies require capacity building measures for (i) a better understanding of the project-related environmental issues; and (ii) to strengthen their role in implementation of mitigation measures and subsequent monitoring. Thus, trainings and awareness workshops are included in the project with the primary focus of enabling the VCICDP PMU and PIUs staff to conduct impact assessments and carry out environmental monitoring and implement EMPs. After participating in such activities, the participants will be able to make environmental assessments for subsequent subprojects, conduct monitoring of EMPs, understand government and ADB requirements for environmental assessment, management, and monitoring (short- and long-term), and incorporate environmental features into future project designs, specifications, and tender/contract documents and carry out necessary checks and balances during project implementation.

42. **Government Regulatory Body.** The Andhra Pradesh Pollution Control Board (APPCB) is the main state-level regulatory agency that is responsible environment protection and pollution control. APPCB through its 19 Regional Offices (RO) across the state regulates environmental protection related activities. Subproject towns across the Vishakhapatnam Chennai Industrial Corridor are under the jurisdiction of different Regional Officer's and they will monitor the Subprojects operation and compliance with the standards.

43. APPCB monitors the environmental parameters to check whether or not it meets the standards stipulated in its consent order. Surveillance monitoring by APPCB staff, at least once a year, by visiting the project sites and collecting the sample and testing at APPCB laboratory, and specific monitoring in case of public complaints.

44. Under output 3 of Project 2, which will enhance sustainable and green industrial development through establishment of model green industrial corridor operational guidelines; development of disaster risk management plan to strengthen industrial cluster resilience, and

formulation of a plan for the sustainable operation and maintenance of start-up industrial clusters. As part of these, institutional strengthening of APIIC, particularly at industrial park level, will be suggested with an aim to: promote environmental sustainability; ensure regulatory compliance in pollution control and encouraging international good practices and ISO certification; facilitate redress of public grievances; facilitating awareness, training and capacity building programs for member industries and other stakeholders; and documenting, reporting and public disclosure of environmental performance etc.

F. Lessons learnt from the previous ADB Projects implemented in India

45. Experiences and lessons learnt from the projects implemented in India — focusing on environmental safeguards, is presented in the table below, with possible remedies which can be included in the subprojects to be considered in the succeeding tranche.

Table 5: Lessons Learnt from past ADB Project implementation

No	Field	Details	Remedial measures
1	Government approvals and clearances - delay	<p>Obtaining approvals and clearances from Government regulatory agencies is time consuming and cumbersome, especially related to forest and environment.</p> <p>For some projects, where forest land acquisition was necessary, the implementation was either delayed or alternative non-forest sites were to be identified as forest department denied approval. In some instances the Forest Department revoked the clearance issued for construction of a water reservoir in forest land, necessitating identification of alternative non-forest site that resulted in change in design and delay in implementation</p>	<p>Cumbersome and time-consuming process may be correct to deter project agencies to go for forest lands.</p> <p>Therefore: Avoid locating project facilities in forests or lands with any encumbrances.</p> <p>Create awareness in PIUs officials to avoid forest lands</p> <p>If unavoidable, liaise with local forest office right from site identification.</p> <p>Duly consider time required for obtaining clearances in project schedule</p> <p>Sensitize staff on regulatory requirements, ensure that works are not conducted without valid clearances</p>

No	Field	Details	Remedial measures
2	Documentation of IEE studies: non-inclusion of Project Associated Facilities in the IEE study	<p>The subproject included works from WTP to consumer end, while the intake and raw water transmission works were part of a state funded project implemented by the state department to cover several towns. The intake is located in a River, which is a habitat for endangered species and declared as sanctuary.</p> <p>As the intake/source augmentation works are not in the scope, the issues related to intake were not considered in the IEE.</p>	<p>As per the ADB SPS 2009, environmental assessment study should include all associated facilities.</p> <p>Associated facilities may be funded separately (by the borrower/client 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</p>
	Delay in updating IEEs during implementation to reflect scope change	Commencement of civil works of components that were not originally in IEEs without updating the IEEs; non-compliance and need to implementation of corrective actions	<p>Reflect the scope of project clearly in the IEE</p> <p>Sensitize contractors, consultants, and PIU/PMUs on the requirement of updating IEEs to reflect any scope changes prior to commencement of works</p>
3	Poor implementation of environmental safeguards during construction.	<p>While there is significant improvement in documentation of environmental studies, the implementation of EMP during construction has been poor. Even with the continuous efforts, implementation is poor. Workers are reluctant to use Personal protection equipment citing inconvenience in work, and</p> <p>contractors show least interest in implementation of measures including public safety, road blocks, traffic management and dust control. The main reasons are lack of awareness and ignorance on workers part and lack of instruments to deal with non-compliances (penalties or incentives). Almost always the</p>	<p>Create awareness in workers on workplace safety & public safety</p> <p>Create awareness in staff, administrators, supervising staff and general public regarding EMP provisions and contractor's Responsibilities</p> <p>Appoint full time field-based safeguard support staff to ensure continuous monitoring</p> <p>Increase contractor accountability towards EMP implementation</p> <p>Introduce penalties for non-compliance</p> <p>Introduce incentives for</p>

No	Field	Details	Remedial measures
		construction progressed slowly, and the main focus of PIU and PMU has been on timely completion and construction quality, at the cost of poor EMP implementation. Importantly most of the project staff and local administrators are of the belief that these are common temporary inconveniences during construction and have to be tolerated. Another main problem is of subcontracting by the contractor to small firms with no experience in good and safe construction methods	good implementation of EMP

ADB = Asian Development Bank; EC = Environmental Clearance; EIA = Environmental Impact Assessment; EMP = Environmental Management Plan; IEE = Initial Environmental Examination; PIU = Project Implementation Unit; PMU= Project Management Unit

III. ANTICIPATED ENVIRONMENTAL IMPACTS

46. Eight IEEs prepared for Project 1 subprojects demonstrate that VCICDP is (i) not likely to cause any significant adverse environmental impacts; (ii) any impacts during construction and operation can be mitigated through proper design and good construction and operations practices; (iii) environmental impacts during the construction activities are anticipated to be temporary, localized and can be easily avoided or minimized with the implementation of mitigation and monitoring measures which are detailed in the EMP. VCICDP project 1 was classified as Category B as per ADB SPS. The four draft IEEs prepared during loan processing were updated as required based on detailed design and implementation, and IEEs for the remaining four Project 1 subprojects were prepared during project implementation to assess and review the anticipated environmental impacts during design, pre-construction, construction and operation phases of the project. Other measures such as preparation and implementation of traffic management plans have been carried out in coordination and consultation with all the stakeholders of the project.

47. The proposed subprojects for Project 2 are of similar in nature and scope with Project 1, the anticipated impacts during design, construction, and operation are expected to be of similar scale, duration and magnitude. Project 2 is classified as Category B as per ADB SPS, and draft IEEs have been prepared for seven subprojects during periodic financing request preparation. These will be updated as necessary during detailed design and/or implementation. The executing agency will ensure compliance with the EARF during the implementation.

48. General environmental impacts are identified below in Table 6 which are to be re-assessed during implementation.

Table 6: Anticipated Environmental Impacts for Subprojects

Impact field	Anticipated impact on the environment	Applicability to Subprojects (transport / energy / industrial / urban)
Design Phase		
Environmental Clearance	Environmental clearances, consents, and permits are required in order to implement the project. Land allotment letter, if required, is of prime interest. If not pursued on timely basis, this can delay the project. Necessary environmental clearances and permits have to be obtained and follow the guidelines issued by the authorities.	All subprojects
Utilities	Telephone lines, electric poles and wires, water pipe (old) existing within right-of-way (ROW) require shifting without disruption to services.	All subprojects
Water Supply	Health risk due to temporary closure of existing water supply.	All subprojects
Asbestos cement pipes	Risk of contact with carcinogenic materials	Urban
Social and Cultural Resources	Ground disturbance can uncover and damage archaeological and historical remains. Access to sites of cultural/religious importance may be affected during civil constructions (especially during pipe laying type of works).	All subprojects
Construction work camps, hot mix plants, storage areas, and disposal areas	Locations may cause encroachment/impact either directly or indirectly on adjacent environments. It may also include the impacts on the people who might lose their homes or livelihoods due to the subproject activities.	All subprojects
Traffic	Traffic flow will be disrupted if routes for delivery of construction materials and temporary blockages during construction activities are not planned and coordinated.	All subprojects
Land and ROW for WTP, transmission towers and transmission lines	Conversion of present land use to proposed land use, if not pursued on timely basis can delay the project.	Energy / Transport / Industrial
Construction Phase		
Sources of materials	Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution.	All subprojects

Impact field	Anticipated impact on the environment	Applicability to Subprojects (transport / energy / industrial / urban)
Air Quality	Emissions from construction vehicles, equipment, and machinery used for excavation and construction resulting to dust and increase in concentration of vehicle- related pollutants such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons.	All subprojects

Impact field	Anticipated impact on the environment	Applicability to Subprojects (transport / energy / industrial / urban)
	Sensitive receptors (e.g., hospitals, schools, churches) may be affected temporarily by increased traffic and related impacts during the construction phase (from the proposed detour). Fugitive dust can also impact on roadside air quality during construction. Exhaust fumes from construction machinery, and potential smoke from cooking fires. Burning of waste and cleared vegetation Odors from use of toilet facilities other than provided facilities.	
Geology and Soil	Strong water flows into open excavations below the water table will occur, causing micro-tunnel collapse. Layers of mixed fill cover natural ground surface in many places. Contamination from spillage of petroleum products, spent engine oil and oil leaks from construction vehicle maintenance taking place on site.	Transport / Energy
Drainage and Hydrology	The proposed development is situated within an existing built-up area where the water supply infrastructures already exist. Due to the nature and locality of the subproject there is unlikely any significant impacts on water resources within the immediate area.	Urban
Surface water quality	Mobilization of settled silt materials, run-off from stockpiled materials, and chemical contamination from fuels and lubricants during construction works can contaminate downstream surface water quality.	Transport / Energy

Noise and Vibration	<p>Sensitive receptors (hospitals, schools, churches) may be affected temporarily by increased traffic and related impacts</p> <p>Use of heavy vehicles and equipment may generate high levels of noise.</p> <p>Vibrations resulting from blasting, bulk earthworks, micro-tunneling, and compaction may create significant disturbances to nearby people and businesses.</p> <p>Disturbance from afterhours work.</p>	Transport
Biodiversity Flora and Fauna	<p>The proposed development is situated within an existing built-up area where the water supply infrastructures already exist. No areas of ecological diversity occur within the subproject location. Due to the nature and locality of the subproject there is unlikely to any significant impacts on biodiversity within the area</p> <p>The pipe laying for the transmission mains may however affect existing roadside trees.</p>	Transport / Energy

Impact field	Anticipated impact on the environment	Applicability to Subprojects (transport / energy / industrial / urban)
Ecological resources	Felling of the trees—affect terrestrial ecological balance and affect terrestrial and aquatic fauna/wildlife.	Transport / Energy
Existing infrastructure and facilities	There is likely to have temporary disruption of infrastructure and services during the pipe laying of the transmission mains. There are a number of existing infrastructure and services (roads, railway lines, telecommunication lines, power lines and various pipelines within the vicinity of the subproject.	All subprojects
Aesthetics, landscape character and sense of place	The presence of heavy-duty vehicles and equipment, temporary structures at construction camps, stockpiles, may result in impacts on aesthetics and landscape character	Transport / Energy
Accessibility	Due to the location and nature of the subproject, there will be interference with access Existing public transport facilities and operations will be affected by the road closure and detours. Shops and establishments are located along the transmission mains alignment therefore will need to be relocated during construction. This may impact on livelihoods. There will be disruptions to health services, education services, local businesses, transport services, pedestrian movements, due to traffic and construction related noise, visual, and air pollution.	Transport / Urban
Traffic	Increased volume of construction vehicles on the roads may lead to increased wear and tear of roads in the vicinity of the subproject site. Road safety concerns due to slow moving construction vehicles. Traffic flow within the vicinity will be affected. The temporary road closure will result in a decrease in overall network performance in terms of queuing delay, travel times/speeds. The road closure will impact on a public transport operations and routing. On street parking and loading bays will be affected by the proposed road closure. Pedestrian movements will be affected by the road closure.	All subprojects
Socio-economic income	Impede the access of residents and customers to nearby shops. Shops may lose business temporarily.	Transport / Urban
Occupational Health and Safety	Danger of construction related injuries. Open fires in construction camp can result in accidents	All subprojects

Impact field	Anticipated impact on the environment	Applicability to Subprojects (transport / energy / industrial / urban)
COVID19 prevention and control	<p>Safety of workers and general public must be ensured.</p> <p>Poor waste management practices and unhygienic conditions at temporary ablution facilities can breed diseases.</p> <p>Standing water due to inadequate storm water drainage systems, inadequate waste management practices, pose a health hazard to providing breeding grounds for disease vectors such as mosquitoes, flies and snails.</p> <p>The use of hazardous chemicals in the micro-tunneling and restoration of roads can pose potential environmental, health and safety risks.</p> <p>Road safety may be affected during construction, especially when traffic is detoured.</p>	
Asbestos cement pipes	Health risk in case of their presence in the ROW and/or during the rehabilitation of the existing water supply distribution network	Urban
Workers conduct	Construction workers on site disrupting adjacent land uses by creating noise, generating litter, and possible loitering.	All subprojects
Employment generation	<p>The subproject will provide employment opportunities for local people during construction.</p> <p>Expectations regarding new employment will be high especially among the unemployed individuals in the area.</p> <p>Labor gathering at the site for work can be a safety and security issue and must be avoided.</p> <p>The training of unskilled or previously unemployed persons will add to the skills base of the area.</p>	All subprojects
Community health and safety COVID19 prevention and control	Community hazards which can arise during construction (e.g., open trenches, air quality, noise, falling objects, etc.). Trenching on concrete roads using pneumatic drills will cause noise and air pollution. Traffic accidents and vehicle collision with pedestrians during material and waste transportation.	All subprojects
Construction waste	Trenching will produce additional amounts of waste soil. And also, accumulation of debris waste materials and stockpiling can cause environmental visual pollution.	Transport / Urban
Work camps COVID19 prevention and control	Temporary air and noise pollution from machine operation, water pollution from storage and use of fuels, oils, solvents, and lubricants. This may cause conflict with residents and problem of waste disposal and disruptions to residents.	Transport / Energy

Impact field	Anticipated impact on the environment	Applicability to Subprojects (transport / energy / industrial / urban)
Social and cultural resources	The proposed development will not require demolition of ASI- or state-protected monuments and buildings however there is risk of archaeological chance finds. Sites of social/cultural importance (schools, hospitals, religious place, tourism sites) may be disturbed by noise, dust, vibration, and impeded access.	Transport / Energy
Clean up operations, restoration and rehabilitation	Impacts on social or sensitive receptors when post construction requirements are not undertaken, e.g., proper closure of camp, disposal of solid waste, and restoration of land after subproject construction.	All subprojects
Operation & Maintenance Phase		
General Maintenance	Maintenance activities may cause disturbance to sensitive receptors, dusts, and increase in noise level.	All subprojects
Air Quality	Sensitive receptors (e.g., hospitals, schools, churches) may be affected temporarily by increased traffic and related impacts during transmission mains and distribution network maintenance.	All subprojects
Biodiversity flora and fauna	The proposed development is situated within an existing built-up area where the water supply infrastructures already exist. No areas of ecological diversity occur within the subproject location. Due to the nature and locality of the subproject there is unlikely to any significant impacts on biodiversity within the area during maintenance works The use of fertilizers and herbicides in maintenance of newly planted trees, landscape and vegetation may however affect the environment.	Transport / Energy
Land Uses	Due to the location and nature of the subproject, there will be interference with access during maintenance works Existing public transport facilities and operations will be affected by the road closure and detours. There will be disruptions to health services, education services, local businesses, transport services, pedestrian movements, due to traffic and maintenance-related noise, visual, and air pollution.	Transport / Energy
Health and Safety COVID19 prevention and Control	Danger of operations and maintenance-related injuries. Safety of workers and general public must be ensured. Poor waste management practices and unhygienic conditions at the improved facilities can breed diseases.	All subprojects

Impact field	Anticipated impact on the environment	Applicability to Subprojects (transport / energy / industrial / urban)
	Standing water due to inadequate storm water drainage systems, inadequate waste management practices, pose a health hazard to providing breeding grounds for disease vectors such as mosquitoes, flies and snails. The use of hazardous chemicals in the WTPs can pose potential environmental, health and safety risks.	
Noise and vibrations	Sensitive receptors (hospitals, schools, churches) may be affected temporarily by increased traffic and related impacts. Disturbance from afterhours work.	All subprojects
Workers conduct	Maintenance workers on site disrupting adjacent land uses by creating noise, generating litter, and possible loitering.	All subprojects
Solid waste	Solid waste residuals which may be generated by the WTPs and STPs include process residuals, used filtration membranes, spent media and miscellaneous wastes. Process residuals primarily consist of settled suspended solids from source water and chemicals added in the treatment process.	All subprojects
Waste water	Wastewater from the WTPs include filter backwash and supernatant liquid from the sludge beds/ponds. These waste streams may contain suspended solids and organics from the raw water, dissolved solids, high or low pH, heavy metals, etc.	Urban / Industrial
Sludge generation	Sludge generated from the WTP may contain heavy metals and other hazardous substance.	Urban / Industrial
Hazardous chemicals	Water treatment involves the use of chemicals for coagulation, disinfection and water conditioning.	Urban / Industrial
Economic developments	Impediments to residents and businesses during routine maintenance.	Urban

IV. ENVIRONMENTAL ASSESSMENT FOR SUBPROJECTS AND/OR COMPONENTS

A. Environmental Criteria for Subproject Selection

49. The following criteria will be used for excluding sites which might have significant negative environmental impacts:

- (i) ecologically sensitive area such as national parks, wildlife sanctuaries, biosphere reserves, internationally recognized areas, etc.;
- (ii) potential for disrupting the life and property of the indigenous or tribal population;
- (iii) need for significant amount of land acquisition and resultant compensation; and
- (iv) encroachment on historic and cultural features like international or central or state protected monuments and archeological/historical sites.

50. Guidelines for subproject selection in Table 7 provide further guidance to avoid or minimize adverse impacts during the identification and finalization of subprojects.

Table 7: Environmental Considerations in Subproject Selection

Component	Criteria	Remarks
1. Overall selection guideline (applicable to all components)	Comply with all requirements of ADB SPS and relevant national and state requirements	See Section II of this EARF
	Site selection process shall avoid where possible land acquisition and involuntary resettlement where possible including impact on vulnerable persons and indigenous peoples	See Resettlement Framework and Indigenous Peoples Planning Framework
	Subproject selection will not result in the disturbance or will avoid encroachment on historic and cultural features like international or central or state protected monuments and archeological/historical sites	Approval from concerned authority if unavoidable
	Site selection shall avoid locations in protected areas, including reserved forests or biodiversity conservation hotspots (wetlands, national reserved, forest reserves, and sanctuaries)	
	The subproject shall avoid where possible, and minimize to extent feasible facilities in locations with social conflict	

Component	Criteria	Remarks
	The subproject shall avoid, where possible tree cutting and if any trees have to be removed, two trees will be planted for every tree removed	Approval from Forest Department
	The subproject shall retain mature roadside trees which are important/valuable or historically significant.	
	The subproject shall reflect inputs from public consultation and disclosure for site selection	
2. Urban and Industrial Water Supply	Comply with all requirements of relevant national law.	See Section II of this EARF
	Locate all new facilities/buildings such as pumping stations, water tanks, and/or WTP (including chlorinators) at least 100 m from houses, shops or any other premises used by people, thus establishing a buffer zone to reduce the effects of noise, dust and the visual appearance of the site.	Distance restriction may be reviewed depending on site availability and buffer zone planning
	Locate all new facilities/buildings at sites where there is no risk of flooding or other hazards that might impair functioning of or present a risk of damage to existing water treatment plants, reservoirs, or its environs.	
	Consult the Department of Archaeology regarding the archaeological potential of proposed sites of buildings, primary mains, and distribution network to ensure that these are located in areas where there is a low risk of chance finds.	
	Avoid all usage of pipes that are manufactured from asbestos concrete	
	Locate pipelines within road right of way (ROW) as far as possible, to reduce the acquisition of new land.	

Component	Criteria	Remarks
	Ensure that pipeline routes do not require the acquisition of land from private owners in amounts that are a significant proportion of their total land holding (>10%).	
	Ensure that communities who relinquish land needed for pipelines or other facilities are provided with an improved water supply as part of the scheme.	
	Ensure that improvements in the water supply system are combined with improvements in sewerage and drainage to deal with the increased discharge of domestic wastewater.	
3. Industrial CETP	Comply with all requirements of relevant national and local laws, rules, and guidelines. Environmental Clearance from MoEF	Naidupeta CETP being implemented under Project 1
	The existing CETP should have valid CFE and CFO from the APPCB	
	The proposal is techno-economically feasible and the cost recovery formula adopted should be ratified by all member units of CETP, competent agencies like IITs or relevant CSIR institutions. Cost of such appraisal should be part of design cost.	
	Evaluate the option of mixing sewage with industrial effluent if it is advantageous to the process. If yes, ensure appropriate arrangement to receive the sewage at the CETP inlet and a suitable agreement with the municipality including for cost sharing should be in place.	
	Subproject design and operation adheres to the notified inlet and outlet standards. Continuous flowmeters are installed at the outlet of CETP to monitor effluent quality.	

Component	Criteria	Remarks
	Subproject should be limited to provision of tertiary treatment facilities for already operating CETPs with primary, and secondary and necessary hazardous sludge disposal facilities.	Utilize TSDF hazardous disposal facilities approved by APPCB. If necessary, provide improved disposal facilities to comply with Hazardous Waste (HW) Rules, 2009. At present, solid waste/sludge from CETP is being sent to TSDF (Hyderabad) for disposal as per HW Rules, 2009
	Tertiary treatment facility should be located within the existing CETP compound.	
	Locate facilities where there is no risk of flooding or other hazards that might impair operations and present a risk of damage to the facilities or its environs.	
	Adequate linkage with Treatment, Storage & Disposal Facility (TSDF) for disposal of hazardous wastes generation from the proposed facility. Subproject shall include a sludge management plan based on sludge characteristics (i.e. hazardous, nonhazardous)	Currently, TSDF operator collects the waste from CETP and transport to TSDF with consent from APPCB.
	Hazardous sludge is transported to TSDF safely and securely following HW Rules, 2009. Should follow the CPCB guidelines for Transportation of Hazardous Wastes, 2006 including transport, labeling and	Consent from Andhra Pradesh Pollution Control Board is mandatory for transport of hazardous waste
Component	Criteria	Remarks
	safety provisions.	
	No manual handling of sludge allowed.	
	Workers should be provided with personal protection equipment and workers should be trained in handling, loading, transport and unloading waste.	
	Provide necessary safety belts and nets to avoid accidental falls	

Component	Criteria	Remarks
	Sludge should be handled carefully without spills either during handling or transport. Sludge should be transported inclosed containers with appropriate labels	
	Prepare Emergency ResponsePlan for sludge transportation.	
	Ensure that appropriate training is provided to the operating agency in operation and maintenance of the tertiary treatment plant and sludge disposal; this should be part of design build contract. Arrange forextended contract period to covera minimum five-year operation during which the output should meet. Notify all member industries about the design inlet quality of effluents to be receivedat CETP. Project should not create nuisance to neighboring areas due to foul odor and influx of insects, rodents, etc.	
	All risks and vulnerabilities related occupational health and safety due to physical, chemical,biological, and radiological hazards during project construction and operation are identified and addressed in the project design & implementation	
	Ensure that there is no impairment of downstream waterquality due to inadequate treatment of industrial effluent. Ensure that there are no overflows and flooding of neighboring areas/ properties with raw effluent. Ensure that theproject will not lead to environmental pollution due to inadequate sludge disposal.	

Component	Criteria	Remarks
	Ensure that the project should not lead to contamination of surface and groundwater due to disposal on land. All health and safety hazards to workers from toxic gases, hazardous material, pathogens etc. are identified, and appropriate mitigation measures are included in the project.	
4. Urban and Industrial Sewerage and Sanitation	Will comply with all requirements of relevant national and state law, including the Water (Prevention and Control of Pollution) Act 1974.	See Section II of this EARF
	Will locate STP preferably 250 m from any inhabited areas, in locations where no urban expansion is expected in the next 20 years, so that people are not affected by odor or other nuisance from the plant.	Distance restriction may be reviewed depending on the technology adopted for the treatment of wastewater, site availability and buffer zone planning
	Avoid locating sewage pumping stations and wet well within 50m of any uninhabited areas, and within 100m of sensitive sites such as hospitals, schools, temples, etc. to minimize nuisance impacts from odour, rodents, etc.	
	Will locate STP at sites where there is a suitable means of disposal for the treated wastewater effluent (e.g., into a natural water course or SWF canal)	
	Will locate STP at sites where there is no risk of flooding or other hazards that might impair functioning of the plant and present a risk of damage to the plant or its environs.	Flood statistics data of the project area needs to be reviewed.
	Will consult the relevant records of national and/or local archaeological agencies regarding the archaeological potential of proposed sites of STP, pumping stations and main sewers, to ensure that these are located in areas where there is a low risk of chance finds.	

	Will ensure that sewage is treated at all times to national wastewater discharge standards, and confirm this by regular	
--	---	--

Component	Criteria	Remarks
	monitoring of effluent from the STP	
	Will ensure that no wastewater is discharged into a water course in which it could be a hazard to downstream users (e.g., a waterway that is used for as a source of water for domestic or municipal supply)	
	Will locate sewage pipelines within the ROW of roads to eliminate acquisition of new land.	
	Will include measures to ensure the safe disposal of sewage sludge without causing an environmental hazard, and if possible, to promote its safe and beneficial use as an agricultural fertilizer.	Any sludge reuse should be to improve soil properties and sustain soil fertility and avoid any contamination risks.
5. Urban and Industrial Transport and Roads	New roads or widening of existing roads involving land acquisition and/or resettlement shall not be included in the program, except as otherwise accepted by ADB and subject to compliance requirements under ADB's SPS (2009)	
	Comply with all requirements of relevant national and local laws, rules, and guidelines.	
	Projects shall involve improvements within the boundary of existing facilities only. Where new facilities are required, these shall be sited on vacant government land and ROWs where feasible.	
	Develop road improvement schemes (road widening, bridge construction, etc.) only where the need is clearly demonstrated by appropriate traffic and hazard studies.	
	Prioritize the widening of existing roads over construction of new roads and conduct widening within the existing ROW to avoid the need to acquire new land.	

	Include the provision of new or improved drainage to remove the increased runoff caused by increasing the road surface area.	
	Include tree planting alongside roads to provide a natural barrier	

Component	Criteria	Remarks
	to noise and visual impacts, and include additional man-made barriers if necessary	
5. Urban and Industrial Power Sector/Transmission-Distribution Network	Subprojects will display performance-based design consistent with international benchmarks for system efficiency and operational risk.	
	Subprojects should have quantifiable energy efficiency improvements and environmental emissions reductions.	
	Subprojects will be eligible for construction in accordance with the approved feasibility assessment, which includes engineering, financial, economic, environmental and social justifications.	
	Safety measures will be incorporated in the subproject design as required under the relevant policies, statutory requirements and regulations.	
	Design of subprojects will be finalized taking into account the input from public consultation carried out in the social and environmental assessments as appropriate.	
	Environmental screening of the subprojects will be done using the applicable rapid environmental assessment (REA) checklists and an initial environmental examination (IEE) or environmental impact assessment (EIA) including an environmental management plan with budget for implementation will be prepared following the ADB's Safeguard Policy Statement (2009)	

	Aside from the criteria above, the subproject must not be listed in ADB's prohibited investment activities list given in Appendix 5 ¹⁵ of SPS 2009.	
--	--	--

B. Environmental Assessment Procedures for Projects

1. Screening and Categorization

51. As soon as sufficient information on a subproject is available, the PIUs with the help of PMSC environment safeguards specialist will conduct screening to determine the works' environmental category by completing ADB's rapid environmental assessment (REA) checklists in Appendix 3 and submitting this for review to the PMU, which will determine required environmental assessment and environmental consents as per ADB SPS and national and state requirements.

52. PMU will classify the subprojects according to ADB SPS categorization to ensure that the project meets ADB's environmental safeguard requirements. PMU will specify the necessary environmental assessment report to be prepared according to the category. PMU will submit completed REA checklist to ADB for review and concurrence.

- (i) **Category A.** The subproject could have significant adverse environmental impacts. An EIA is required to address significant impacts.
- (ii) **Category B.** The subproject could have some adverse environmental impacts, but of lesser degree or significance than those in category A. An IEE is required to determine whether significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.
- (iii) **Category C.** The subproject is unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are reviewed.

53. VCICDP Project 1 was classified as Category B and eight IEEs were prepared for eight subprojects¹⁶ under Project 1. Based on the seven IEEs prepared during Project 2 periodic financing request processing, it is anticipated that eligible subprojects¹⁷ will fall into either category B or C, as subprojects will be of small scale and often involve improvement or rehabilitation of the existing system/facilities. While category C subprojects will not require an

¹⁵ (i) Activities involving harmful or exploitative forms of forced labour or child labour; (ii) Any activity deemed illegal under host country laws or regulations or international conventions and agreements or subject to international phase-out bans, such as pharmaceuticals, pesticides, ozone-depleting substances, polychlorinated biphenyls and other hazardous chemicals, wildlife or wildlife products regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora, and transboundary trade in waste or waste products; (iii) Activities of gambling, casinos, and equivalent enterprises; (iv) Production of, trade in, or use of un-bonded asbestos fibers; (v) Commercial logging operations or the purchase of logging equipment for use in-primary tropical moist forests or old-growth forests; and (vi) 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.

¹⁶ As of November 2022, construction of two subprojects completed, and remaining six are in progress.

¹⁷ Any potential Cat A subproject will be screened out by the screening process and will be considered outside the EARF.

environmental assessment, a due diligence report will be prepared to review environmental implications of the subproject.

54. As per Government of India EIA Notification, 2006 “List of Projects or Activities Requiring Prior Environmental Clearance”, Projects 1 and 2 subprojects are within the threshold limit of Category B projects. However, PMU will simultaneously liaise with the State Environmental Impact Assessment Authority (SEIAA) of Andhra Pradesh regarding subproject categorization as per the EIA Notification, 2006 General and Specific Conditions.¹⁸

2. Preparation of Environmental Assessment Report

55. Environmental assessment documents prepared under the project will, to the extent possible, meet both ADB and Government of India requirements in order to streamline the environmental procedures required by both ADB and government.

56. All environmental assessment will be conducted and reports will be prepared, reviewed and cleared prior to the issuance of bid documents. The bid and contract documents will include the IEEs and specific conditions requiring contractors to incorporate necessary resources to implement the EMP.

57. **ADB environmental assessment reports.** Category A subprojects will be screened out and not considered in the project. For Category B subprojects, an IEE is required. Appendix 4 provides the outline and four IEEs prepared during Project 1 preparation and seven IEEs prepared during Project 2 preparation provide a good sample which can be followed for preparation of the IEEs in subsequent subprojects. For Category C subprojects, a due diligence report is required. Appendix 5 provides the outline for the due diligence report.

58. Pollution prevention for conservation of resources, particularly technology for management of sewage, industrial effluent and sludge occupational and community health and safety will be addressed in the environmental assessment reports. The environmental assessment reports will also reflect meaningful consultation and disclosure process with a provision for grievance redress mechanism.

59. ADB requires that an EMP must be developed as part of the IEEs. The EMP will outline specific mitigation measures, environmental monitoring requirements, and related institutional arrangements, including budget requirements for implementation. Where impacts and risks cannot be avoided or prevented, mitigation measures and actions will be identified so that the

¹⁸ **EIA Notification, 2006 General Condition.** 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 Central Pollution Control Board from time to time; (iii) Eco-sensitive areas, as notified under section 3 of the Environment (Protection) Act, 1986, such as Mahabaleshwar, Panagani, Matheran, Panchmarhi, Dhanu, Doon valley, and (iv) inter-State boundaries and international boundaries: Provided that the required distance of 10 km of the inter-State boundaries can be reduced or completely done away with by an agreement between the respective States or U.Ts sharing the common boundary in case the activity does not fall within 10 kilometers of the areas mentioned at item (i), (ii) and (iii) above.” **EIA Notification, 2006 Specific Condition.** If any Industrial Estate/Complex/Export processing Zones /Special Economic Zones/Biotech Parks/Leather Complex with homogeneous type of industries such as Items 4(d), 4(f), 5(e), 5(f), or those Industrial estates with pre-defined set of activities (not necessarily homogeneous, obtains prior environmental clearance, individual industries including proposed industrial housing within such estates/complexes will not be required to take prior environmental clearance, so long as the Terms and Conditions for the industrial estate/complex are complied with (Such estates/complexes must have a clearly identified management with the legal responsibility of ensuring adherence to the Terms and Conditions of prior environmental clearance, who may be held responsible for violation of the same throughout the life of the complex/estate).

subproject is designed, constructed, and operated in compliance with applicable laws and regulations and meets the requirements specified in the EMP. The level of detail and complexity of the EMP 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.

60. **Government of India environmental assessment reports.** As per GOI requirements, the subprojects will require EC and necessary environmental assessment reports are to be prepared according to EIA Notification, 2006 and its General and Specific Conditions. The ECs must be obtained before any construction work or land preparation (except land acquisition) may commence. Upon submission of application form with necessary subproject details (including Feasibility Report/detailed project report [DPR]) along with the draft Terms of Reference (ToR) for the EIA Study, the Expert Appraisal Committee (EAC) of the MoEF or SEIAA, as the case may be,¹⁹ finalizes the comprehensive ToR for the EIA study. The proponent will conduct the EIA study with the help of an accredited consultant agency.²⁰ MoEF published EIA guidance manuals for several sectors including for CETPs,²¹ which will be used in preparation of draft TOR and the conduct of EIA study. On completion of the EIA study and review of the report by the EAC/SEAC, MoEF/SEIAA considers the recommendation of the EAC/SEAC and provides the EC.

61. The EIA Notification, 2006, also requires that the EIA includes a comprehensive program for monitoring the effectiveness of mitigation measures. An EMP is required, identifying mitigation measures and specifying administrative arrangements to ensure that mitigation measures are implemented, and their effectiveness is monitored after approval of the EIA. A budget for the EMP should also be provided.

3. Environmental Audit of Existing Facilities

62. For subprojects involving facilities and/or business activities that already exist or are under construction, the executing and implementing agencies will undertake an environment audit, including on-site assessment, to identify past or present concerns related to impacts on the environment. The objective of the compliance audit is to determine whether actions were in accordance with ADB's safeguard principles and requirements for borrowers/clients, and to identify and plan appropriate measures to address outstanding compliance issues. Where noncompliance is identified, a corrective action plan agreed on by ADB and the implementing agencies will be prepared. The plan will define necessary remedial actions, the budget for such actions, and the time frame for resolution of noncompliance. The audit report (including corrective action plan, if any) will be made available to the public in accordance with the information disclosure requirements of ADB SPS, 2009. For environment category A projects involving facilities and/or business activities that already exist or are under construction, the implementing agency will submit the audit report to ADB to disclose on ADB's website. If a project involves an upgrade or expansion of existing facilities that has potential impacts on the environment, the requirements for environmental assessments and planning specified in ADB SPS, 2009 will apply in addition to compliance audit.

¹⁹ For Category A, the application will be submitted to the central MoEF while for Category B, the application will be submitted to SEIAA.

²⁰ As per the Office Memorandum (OM) of MoEF dated December 2, 2009, EIA/EMP reports prepared only by such Consultancy agency accredited for respective EIA sectors by National Accreditation Board for Employment and Training (NABET) / Quality Council of India (QBI) shall be accepted for review and issuance of EC.

²¹ http://environmentclearance.nic.in/writereaddata/Form-1A/HomeLinks/TGM_CETP_010910_NK.pdf

C. Review of Environmental Assessment Reports

63. IEEs will be prepared by PIUs and submitted to PMU which will forward the IEEs for ADB's review. ADB will review draft final reports of: (i) IEEs of any subprojects that have been updated due to changes in design; and (ii) IEEs of any new subproject classified as Category B.

64. For subproject processing, the steps to be followed are shown in Table 8. It is the responsibility of the executing and implementing agencies to ensure subprojects are consistent with the legal framework, whether national or state/local. Compliance is required in all stages of the project including design, construction, operation and maintenance.

Table 8: Environmental Procedures for Project Processing

Project Stage	ADB Procedure	Government of India
Subproject identification	REA checklist	<p>Categorization according to schedule and general/specific conditions of EIA Notification, 2006.</p> <p>All the industrial estate/ start up area infrastructure subprojects to be implemented by APIIC require EIA study and environmental clearance. Subprojects in the Industrial estates will be taken up for implementation after the EC is obtained.</p> <p>None of the road subprojects to be implemented by APRDC are currently listed in the Schedule, and therefore EIA Notification 2006 will not be applicable.</p> <p>EA and IAs should liaise with the SEIAA / MoEF regularly to confirm the legal status in case if any new amendments are notified.</p>
	Categorization (A/B/C): PMU to review the REA checklists and reconfirm the categorization	
Detailed design	Preparation of EIA/IEE Updating of sample IEEs based on detailed design	Submit Consent for Establishment (CFE) application along with Project Report to APPCB.
	For projects involving facilities and/or business activities that already exist or are under construction, the borrower/client 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, and involuntary resettlement. Where non-compliance is identified, a corrective action plan agreed on by ADB and the borrower/client will be prepared.	Incorporate appropriate compliance conditions, modifications, suggestions into the project design, and finalize the Detailed Project Report.
	Public consultation will be carried out in a manner commensurate with the impacts of affected communities. The consultation	PIUs to conduct meaningful consultations. Proceedings, records and issues raised will be included in the IEE. Measures to address issues will be considered in the design and EMP.

Project Stage	ADB Procedure	Government of India
	process and results are to be documented and reflected in the IEE.	
	Disclosure: For category A: Disclosure on ADB's website of a draft full EIA (including the draft EMP) at least 120 days prior to the ADB Board consideration, and/or EARF before project appraisal where applicable; the final EIA; updated EIAs and corrective action plans; and environmental monitoring reports. For category B: Disclosure on	PIUs to disclose project-related information in form and language understandable by stakeholders and affected people.

Project Stage	ADB Procedure	Government of India
	ADB's website of the final IEE; updated IEEs and corrective action plans; and environmental monitoring reports. In addition, for all categories, environmental information will be in an accessible place and in a form or language understandable to affected people and other stakeholders. For illiterate people, other suitable communication methods will be used.	
	Mitigation measures specified in EIA/IEE study incorporated in project design	PIUs to include in IEE which will be included in bid and contract documents.
	Identify and incorporate environmental mitigation and monitoring measures (including the EMP) into bid/contract documents.	
Appraisal	EMP and other environmental covenants are incorporated into the facility framework agreement, loan/project agreement, and project administrative memorandum (PAM)	To be included in the PAM of Project 2
Approval	ADB to review and clear EIA/IEE prior to approval and issuance of tender and other bidding documents during detailed design stage. Complete EIA/IEE disclosed to public	

Contract award	Obtain necessary environmental clearances, consents, and no-objection certificates (NOCs) prior to contract award. Implementation of EMP including monitoring plans based on EIA/IEE findings to be incorporated into civil works contracts.	Ensure that CFE is issued prior to award of contract / commencement of works as appropriate
Implementation	Submission of semi-annual monitoring report to ADB including corrective action plan where non-compliance is identified.	Monitoring and reporting as per conditions stipulated in the CFE (during construction phase) and CFO (during commissioning and operation phases). CFO Renewal. For CETP/STP, CFOs must be renewed every 1 or 3 years.

ADB = Asian Development Bank; CFE = Consent for Establishment; CFO = Consent for Operation; EARF = Environmental Assessment and Review Framework; EMP = Environmental Management Plan; IEE = Initial Environmental Examination; PMU = Project Management Unit; MoEF = Ministry of Environment & Forest; NOC = No Objection Certificate; PAM = Project Administration Memorandum; SEIAA = State Environmental Impact Assessment Authority; STP = Sewage Treatment Plant; REA = Rapid Environmental Assessment Checklist; APPCB = Andhra Pradesh Pollution Control Board

V. CONSULTATION, INFORMATION DISCLOSURE, AND GRIEVANCE REDRESS MECHANISM

A. Public Consultation and Information Disclosure

65. Meaningful stakeholder consultation and participation is part of the project preparation and implementation strategy. A consultation and participation strategy will be designed and implemented with the assistance of consultants. By addressing stakeholder needs, there is greater awareness of the benefits and “ownership” of the project among stakeholders, which in turn contribute to sustainability. The consultation process during the project preparation has solicited inputs from a wide range of stakeholders, including government officials, NGOs, residents near the subproject locations and towns, marginalized/vulnerable beneficiary groups, and project-affected persons (APs).

66. Consultation, participation, and disclosure will ensure that information is provided and feedback on proposed subproject design is sought early, right from the subproject preparation phase, so that the views/preferences of stakeholders including potential beneficiaries and affected people can be adequately considered, and continue at each stage of the subproject preparation, processing, and implementation.

67. APs will be consulted at various stages in the project cycle to ensure: (i) incorporation of their views/concerns on compensation/resettlement assistance and environmental impacts and mitigation measures; (ii) inclusion of vulnerable groups in project benefits; (iii) identification of help required by APs during rehabilitation, if any; and (iv) avoidance of potential conflicts for smooth project implementation. It will also provide adequate opportunities for consultation and participation to all stakeholders and inclusion of the poor, vulnerable, marginalized, and APs in the project process.

68. Relevant information about any major changes to project scope will be shared with beneficiaries, affected persons, vulnerable groups, and other stakeholders.

69. A variety of approaches can be adopted. At minimum, stakeholders will be consulted regarding the scope of the environmental and social impact studies before work commences, and they will be informed of the likely impacts of the project and proposed mitigation once the draft EIA/IEE and resettlement plan reports are prepared. The report will record; number of participants on each stakeholder’s meeting; date; approach method or style; the views of stakeholders and indicate how these have been taken into account in project development (Appendix-5. Consultations will be held with a special focus on vulnerable groups.

70. The key stakeholders to be consulted during project preparation, EMP implementation, and project implementation include:

- (i) Project beneficiaries;
- (ii) Andhra Pradesh Industrial Association (s)
- (iii) Elected representatives, community leaders, religious leaders, and representatives of community-based organizations;
- (iv) local NGOs;
- (v) Andhra Pradesh Pollution Control Board
- (vi) local government and relevant government agency representatives, including local authorities responsible for land acquisition, protection, and

- conservation of forests and environment, archaeological sites, religious sites, and other relevant government departments;
- (vii) residents, shopkeepers, and business people who live and work alongside the roads which would be widened, where pipes will be laid and near sites where facilities will be built;
- (viii) Custodians, and users of socially and culturally important buildings;
- (ix) VCICDP PMU and consultants; and
- (x) ADB, Government of Andhra Pradesh and the Government of India

B. Information Disclosure

71. Information is disclosed through public consultation and making relevant documents available in public locations. The following documents will be submitted to ADB for disclosure on its website:

For category A projects:

- (i) a draft EIA report, at least 120 days before Board consideration;
- (ii) a new or updated EIA and corrective action plan prepared during project implementation, if any; and
- (iii) environmental monitoring reports.

For category B projects:

- (i) final IEE;
- (ii) a new or updated IEE and corrective action plan prepared during project implementation, if any; and
- (iii) environmental monitoring reports.

72. VCICDP PMU will send written endorsement to ADB for disclosing these documents on ADB's website. VCICDP PMU will also provide relevant safeguards information in a timely manner, in an accessible place and in a form and languages understandable to affected people and other stakeholders. For illiterate people, other suitable communication methods will be used.

C. Grievance Redress Mechanism

73. **Project grievance redress mechanism.** A project-specific, three-tier GRM covers both environment and social issues. The GRM has been established to receive, evaluate, and facilitate the resolution of affected persons' concerns, complaints, and grievances about the social and environmental performance at project level. The GRM aims to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns related to the project. Assessment of the GRM designed and implemented for Project 1 shows that the system was effective in timely resolution of grievances in a transparent manner.²² The GRM will be disclosed to the affected communities and households prior to the mobilization of contractors in any subproject areas. The project GRC, supported by the PMSC consultants as well as the PMU

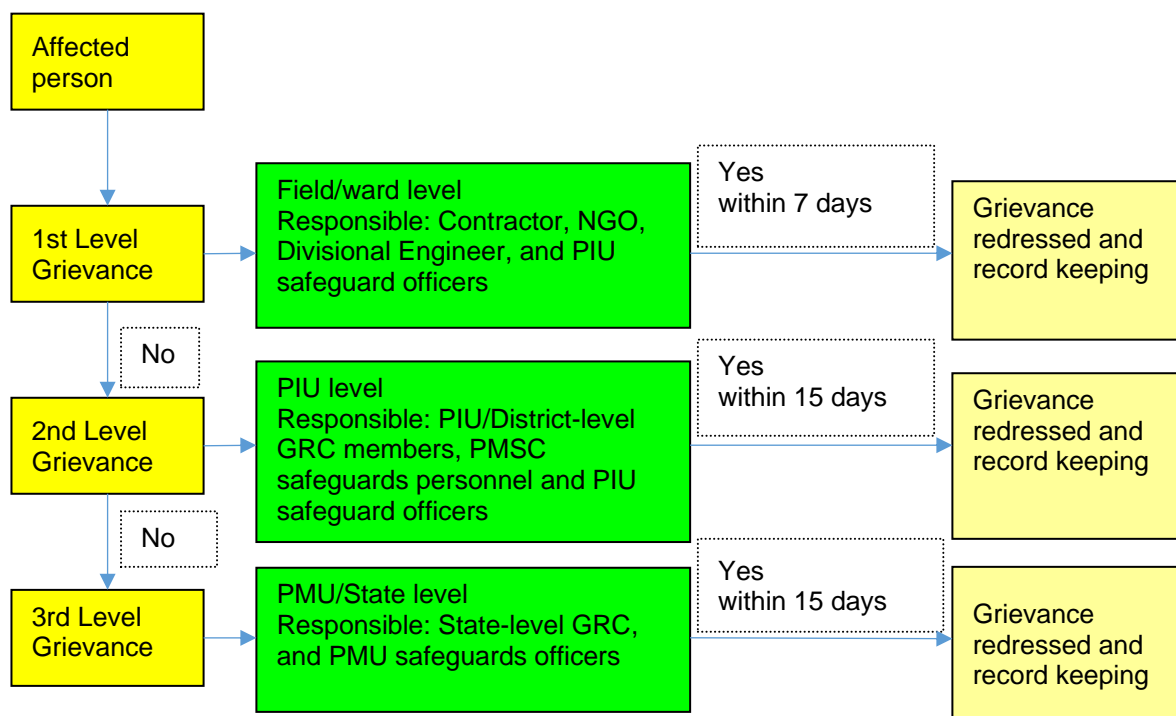
²² Regular recording and resolution of grievances at field level indicates that the GRM structure is working effectively. No major grievance was received for project 1 and the GRM helped smoothen the process of project implementation. Hence the proposed architecture for the project 2 of VCICDP GRM remains similar, with some refinement and strengthening for the industrial startup areas, through (a) provision of help desks at each startup area which would serve as accessible platforms for grievance registration for local communities and (b) ensuring indigenous peoples' representation in the GRM structure at district level, for Chittoor–South startup area.

and PIU safeguard officers will be responsible for timely grievance redress on environmental and social safeguards issues and responsible for registration of grievances, related disclosure, and communication with the aggrieved party. A complaint register will be maintained at field unit, PIU, and PMU levels with details of complaint lodged, date of personal hearing, action taken and date of communication sent to complainant. Contact details, procedures and complaint mechanism will be disclosed to the project affected communities at accessible locations and through various media (i.e., leaflets, newspapers, etc.). Samples of draft project leaflets, grievance registration forms and monitoring templates are in the resettlement framework.

- (i) **1st Level grievance.** The phone number of the PIU office should be made available at the construction site signboards. The contractors and field unit staff can immediately resolve onsite, seek the advice of the PIU safeguard manager (social safeguards and communications/environment safeguards) as required, within seven days of receipt of a complaint/grievance.
- (ii) **2nd level grievance.** All grievances that cannot be redressed within 7 days at field/ward level will be reviewed by the GRC at district level headed by Joint Collector. GRC will attempt to resolve them within 15 days. The PIU safeguard manager (social safeguards and communications/ environment safeguards) will be responsible to see through the process of redressal of each grievance.
- (iii) **3rd Level Grievance.** All grievances that cannot be redressed within 15 days at district level will be reviewed by the GRC at state level headed by the project director, PMU with support from district GRC, PMU officer - social safeguard and communications/officer-environmental safeguards, and PMC environment and social safeguards specialists. GRC will attempt to resolve them within 15 days. The PMU officer - social safeguard and communications will be responsible to see through the process of redressal of each grievance pertaining to social safeguards.

74. The multi-tier GRM for the project is outlined below (Figure 1), each tier having time-bound schedules and with responsible persons identified to address grievances and seek appropriate persons' advice at each stage, as required. The GRC will continue to function throughout the project duration.

Figure 1: Grievance Redress Mechanism – Visakhapatnam–Chennai Industrial Corridor Development Program



GRC = grievance redressal committee, PIU = project implementation unit, PMU = project management unit, PMSC = project management and supervision consultant.

A. Grievance Redressal Committee

75. GRC consists of two-levels, one at district level and another at state/PMU level, to receive, evaluate and facilitate the resolution of displaced persons concerns, complaints and grievances. GRC at district level will receive, evaluate, and facilitate the resolution of displaced persons concerns, complaints, and grievances. The GRC will provide an opportunity to the affected persons to have their grievances redressed prior to approaching the State level LARR Authority, constituted by GOAP in accordance with Section 51(1) of the RFCTLARR Act, 2013. The GRC is aimed to provide a trusted way to voice and resolve concerns linked to the project, and to be an effective way to address displaced person's concerns without allowing it to escalate resulting in delays in project implementation. In case of any indigenous peoples impacts in subprojects, the GRC (at district level) must have representation of the affected indigenous people community, the chief of the tribe or a member of the tribal council as traditional arbitrator (to ensure that traditional grievance redress systems are integrated) or an independent indigenous peoples expert or an NGO working with indigenous people groups. GRC will also ensure that grievance mechanism established is gender inclusive in receiving and facilitating resolution of the IPs' concerns.

76. The GRC will continue to function, for the benefit of the displaced persons, during the entire life of the project including the defects liability period. The entire resettlement component of the project has to be completed before the construction starts, and pending grievances resolved. Other than disputes relating to ownership rights and apportionment issues on which the LARR Authority has jurisdiction, GRC will review grievances involving all resettlement benefits, relocation, and payment of assistances. The GRCs will function out of each district where the subprojects are being implemented. The existing setup for coordination, monitoring, and grievance redress at district level which meets once a month, will be used for Project 2 of VCICDP. The GRC chaired by Joint Collector, will comprise of the Divisional/Project Engineer acting as its member secretary and the following members: (i) Revenue Divisional Officer/Sub-Collector of the division; (ii) project director, District Rural Development Agency; (iii) Chief Executive Officer, Zilla Parishad; (iv) District Panchayat Officer; (v) District Education Officer; (vi) District Medical and Health Officer; (vii) District Level representative of power distribution companies; and (viii) Superintendent, Rural Water Supply Panchayat Raj Department, three members from affected persons (with at least one being a woman affected person), team leader of the implementing consulting agency/NGO. The contact details of the GRC, PIUs safeguards manager, and the resettlement plan implementation NGO/agency will be included in the brochures to be circulated among all affected people as a first step in resettlement plan implementation.

77. The project director, PMU will be the appellate authority who will be supported by the PMSC and Safeguard Officer (social safeguards and communications/ environment safeguards) of PMU and concerned PIUs to make final decisions on the unresolved issues. Despite the project GRM, an aggrieved person shall have access to the country's legal system at any stage and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM.

78. **Accountability Mechanism.** In the event that the established GRM is not in a position to resolve the issue, the affected person also can use the ADB Accountability Mechanism through directly contacting (in writing) the Complaint Receiving Officer at ADB headquarters or the ADB India Resident Mission. People who are, or may in the future be, adversely affected by the project may submit complaints to ADB's Accountability Mechanism. The Accountability Mechanism provides an independent forum and process whereby people adversely affected by ADB-assisted projects can voice, and seek a resolution of their problems, as well as report alleged violations of ADB's operational policies and procedures. Before submitting a complaint to the Accountability Mechanism, affected people should make an effort in good faith to solve their problems by working with the concerned ADB operations department. Only after doing that, and if they are still dissatisfied, should they approach the Accountability Mechanism.²³

79. **Record-keeping.** Each of the PIUs of each town/city will keep records of grievances received, including contact details of complainant, date the complaint was received, nature of grievance, agreed corrective actions, and the date these were affected and final outcome. The number of grievances recorded and resolved, and the outcomes will be displayed/disclosed in the PMU office, PIU offices, and on the web, as well as reported in monitoring reports submitted to ADB on a semi-annual basis. The sample grievance registration format is attached as Appendix 16.

80. **Periodic review and documentation of lessons learned.** The PMU Officer (social safeguard and communications/environmental safeguards) will periodically review the functioning

²³ ADB. [Accountability Mechanism](#).

of the GRM in each nodes and record information on the effectiveness of the mechanism, especially on the project's ability to prevent and address grievances.

81. **Costs.** Costs involved in resolving the complaints (meetings, consultations, communication, and reporting/information dissemination) will be borne by the concerned PIU at town level while costs related to escalated grievances will be met by the PMU. Cost estimates for grievance redress are included in resettlement cost estimates.

82. **Capacity building.** Regular capacity building activities on social safeguards are proposed, including quarterly training for safeguards officers of PIUs in year 1, followed by semiannual training in years 2 and 3 of project implementation, and semiannual training for at least 40 staff of PMU, PIUs, and resettlement NGO in the first 3 years of project implementation. Capacity building training will be undertaken by PMSC social safeguards coordinator on safeguards issues of the projects, resettlement framework of VCICDP and ADB Safeguards Policy. The PIU safeguards managers will be further supported by the PMSC experts through on the job training for resettlement plan updating, implementation, complaint resolution and report writing on safeguards.

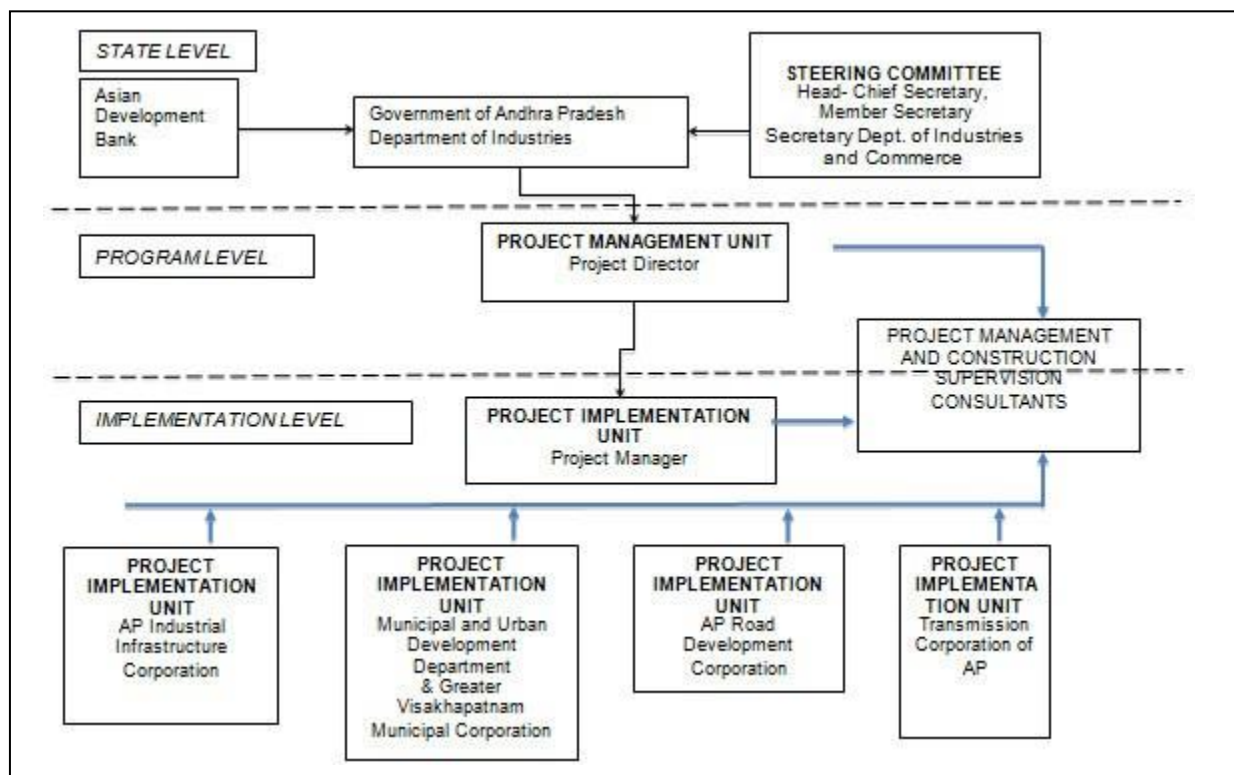
83. **Civil works contracts.** The PIUs will ensure that bidding and contract documents include specific provisions requiring contractors to comply with all (i) applicable labor laws and core labor standards on prohibition of child labor as defined in national legislation for construction and maintenance activities, on equal pay for equal work of equal value regardless of gender, ethnicity or caste, on elimination of forced or bonded labor; and (ii) the requirement to disseminate information on infectious diseases such as coronavirus disease and sexually transmitted diseases including HIV/AIDS to employees and local communities surrounding the project sites. Relevant provisions of the GESI AP will be shared with the contractors' responsibilities by the PMU and PIUs. Contractors will carry out all environmental and social mitigation and monitoring measures outlined in their contract and will maintain grievance registers and place GRM signboards at work sites. PMSC specialists will assist the PMU and PIUs in monitoring contractor's compliance activities.

84. **Prohibited investment activities.** Pursuant to ADB's Safeguard Policy Statement (2009), ADB funds may not be applied to the activities described on the ADB Prohibited Investment Activities List set forth at Appendix 5 of the Safeguard Policy Statement (2009).

VI. INSTITUTIONAL ARRANGEMENTS AND RESPONSIBILITIES

85. DOI is the executing agency. A PMU is established within the Directorate of Industries, which is under the DOI, for planning, implementation, monitoring and supervision, and coordination for both the PBL and MFF. PIUs, established in APIIC, APRDC, GVMC, and APTransco, will be responsible for implementing the MFF. PMU has recruited PMSC to provide support in implementation of VCICDP.

86. PMU will support PIUs in implementation, management and monitoring of the project. PMU and PIUs will be assisted by PMSC respectively. PIUs will appoint construction contractors to build infrastructure. Once the infrastructure is built and commissioned, the PIUs will operate and maintain the infrastructure. At state-level a Project Steering Committee (PSC) will be established to provide overall policy direction for the implementation of VCICDP.

Figure 2: VCICDP Implementation Arrangements

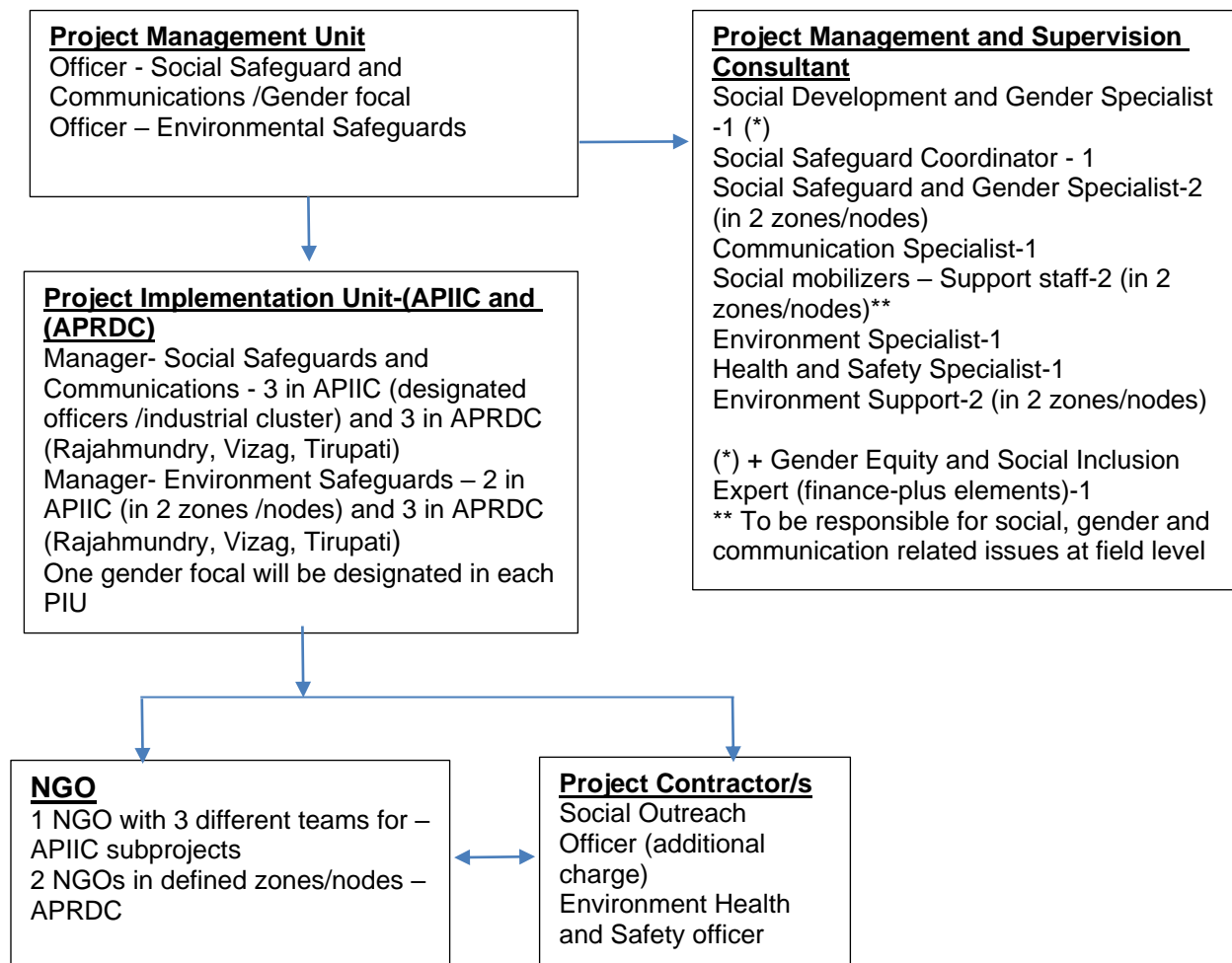
87. The GOAP will ensure that all the requirements prescribed in Schedule 5 of the framework financing agreement, and the following frameworks that have been prepared with respect to the Facility are complied with during the processing and implementation of VCICDP: (i) environmental assessment and review framework (EARF), (ii) resettlement framework, and (iii) indigenous peoples planning framework (IPPF).

88. The safeguard frameworks cover the Facility specific information and requirements in accordance with ADB's Safeguard Policy Statement, 2009: (i) the general anticipated impacts of subprojects likely to be financed under the Facility on the environment, involuntary resettlement, and indigenous peoples; (ii) the safeguard criteria that are to be used in selecting projects; (iii) the requirements and procedure that will be followed for screening and categorization, impact assessments, development of management plans, public consultation and information disclosure, and monitoring and reporting; (iv) the institutional arrangements (including budget and capacity requirements) and government's and ADB's responsibilities and authorities for the preparation, review and clearance of safeguard documents.

89. The applicability and relevance of each safeguard framework for Tranche 2 has been reviewed and updated to ensure relevance and consistency with all applicable laws and regulations in India and Safeguard Policy Statement, 2009 as amended from time to time. In the event that there is a discrepancy between the laws and regulations of India and ADB safeguard policies, the ADB safeguard policies will prevail. In addition, Government of India will carry out due diligence works on ongoing projects to assess the status of compliance with the safeguards-related plans and frameworks. For each project, GOAP is required to submit safeguard monitoring reports semiannually covering all the aspects and issues from perspectives of environment, land acquisition, and resettlement and indigenous people.

90. All executing and implementing agencies will ensure that VCICDP is implemented with active participation of all stakeholders, using participatory practices, and consultation will continue throughout implementation of the Investment Program. Disclosure of relevant information to these stakeholders will continue throughout implementation of the Investment Program. Safeguards will be the responsibility of the PMU and the respective PIUs. The PMU and PIUs will be supported by experts as part of the PMSC and resettlement plan implementation nongovernment organizations (NGOs). The safeguards implementation organogram is provided in Figure 5.

Figure 3: Safeguards Organogram – Visakhapatnam–Chennai Industrial Corridor Development Program



APIIC = Andhra Pradesh Industrial Infrastructure Corporation, APRDC = Andhra Pradesh Road Development Corporation, NGO = nongovernment organization.

A. Safeguard Implementation Arrangement

91. **Safeguards Implementation Arrangements.** The implementation arrangements put in place for the MFF, and Project 1 will continue for Project 2. Program management unit (PMU) established within Directorate of Industries by DOIC (EA), is responsible for planning, implementation, monitoring and supervision, and coordination of MFF. PMU is supported by Project implementation units (PIUs) established in Andhra Pradesh Industrial Infrastructure

Corporation (APIIC) and Andhra Pradesh Road Development Corporation (APRDC), which will respectively implement industrial infrastructure and road sector subprojects under Project 2. PMU and PIUs are supported by a Project Management and Supervision Consultant (PMSC). Described below are the institutional roles and responsibilities of PMU and PIUs to ensure environmental safeguards are implemented and complied with during design, construction, and operation phases. PMU is staffed with safeguards officers to oversee and ensure environmental and social safeguards compliance. Each PIU has environmental safeguards managers (2 in APIIC and 3 in APRDC, located in each zone/node) to oversee the day-to-day implementation of SEMP by the contractors and ensure safeguards compliance. PMSC team with an environment specialist and a health and safety specialist based in PMU and supported by two field-based environmental engineers in PIUs - one in each Nodes²⁴ will assist PIUs and PMUs in implementation, monitoring and reporting on environmental safeguards. Contractors will be responsible for implementing the mitigating measures during the design/construction phase, and PIUs and PMU will be responsible for monitoring.

92. Program Management Unit (PMU). Key tasks and responsibilities of the PMU environmental safeguards officer with the support of PMSC are as follows:

- (i) confirm existing IEEs/EMPs are updated based on detailed designs and that new IEEs/EMPs are prepared in accordance with the EARF and subproject selection criteria related to safeguards;
- (ii) confirm whether IEEs/EMPs are included in bidding documents and civil works contracts;
- (iii) provide oversight on environmental management aspects of subprojects;
- (iv) ensure SEMP prepared by contractors are cleared by PIUs prior to commencement of civil works;
- (v) establish a system to monitor environmental safeguards of the project including monitoring the indicators set out in the monitoring plan of the SEMP;
- (vi) facilitate and confirm overall compliance with all Government rules and regulations regarding site and environmental clearances as well as any other environmental requirements (e.g., Location Clearance Certificates, Environmental Clearance Certificates etc.), as relevant;
- (vii) Oversee and ensure compliance with labour regulations and ADB SPS prohibited list by contractors and their subcontractors and suppliers etc..
- (viii) supervise and provide guidance to the PIUs to properly carry out the environmental monitoring and assessments as per the EARF;
- (ix) review, monitor and evaluate the effectiveness with which the SEMP are implemented, and recommend necessary corrective actions to be taken as necessary;
- (x) consolidate monthly environmental monitoring reports from PIUs and submit semi-annual monitoring reports to ADB;
- (xi) ensure timely disclosure of final IEEs/SEMPs in locations and in a form and language accessible to the public and local communities; and
- (xii) address any grievances brought about through the Grievance Redress Mechanism (GRM) in a timely manner.

93. **Project Implementation Units.** In APRDC Head Office, the safeguards specialists of APRDC currently working on a World Bank Project will coordinate all environmental and social

²⁴ The environmental engineers may be based at Vizag and Chittore /Vijaywada supporting the subprojects in two ends of the VCIC corridor.

aspects of the projects. In APTransco, given the isolated locations of the proposed sub projects, the subprojects are under different Superintending Engineers and will implement the subprojects through respective circle offices and a special projects cell. The respective Senior Engineers will be deputed/designated as safeguard compliance managers covering separately for environment and social safeguards. In APIIC, the Senior Engineer will be deputed/designated as safeguard compliance manager in addition to the environmental engineer. In GVMC, the Deputy Engineer will be deputed/designated as safeguard compliance officer in addition to the environmental engineer.

Table 9: PIU Environmental Safeguard Manager Tasks and Responsibilities

PIU Environmental Safeguard Manager	Tasks and Responsibilities
Environmental Safeguards –APRDC	(i) include IEEs/EMPs in bidding documents and civil works contracts; (ii) review and approve SEMP's prepared by contractors; (iii) oversee day-to-day implementation of SEMP's by contractors including compliance with all government rules and regulations; (iv) take necessary action for obtaining rights of way; (v) oversee environmental monitoring by contractors; Ensure that workers are paid and treated according to the labour legislations and ADB's SPS prohibited list requirements (vii) take corrective actions when necessary;
PIU Environmental Safeguard Officer	Tasks and Responsibilities
	(vii) submit monthly environmental monitoring reports to PMU; (viii) conduct continuous public outreach and awareness building related to environmental management; (ix) address grievances brought about through the GRM in a timely manner; and (x) organize an induction course for the training of contractors in environmental management to be delivered by PMSC consultants
Senior Engineer Cum Compliance Officer (DE Level) – APTransco	(i) Ensure complete payment and other resettlement assistants provided to the affected people prior to displacements (physical and economical) and starts of civil works in the affected areas; (ii) Coordinate with Safeguard Manager of PMU and ensure all social/environmental requirements if any are met.
Senior Engineer Cum Compliance Officer – APIIC	(iii) Coordinate with Safeguard Manager and ensure all social/environmental requirements are met.

Environmental Engineer - APICC (not exclusive to this project)	<ul style="list-style-type: none"> (i) include IEEs/EMPs in bidding documents and civil works contracts; (ii) review and approve SEMP's prepared by contractors; (iii) oversee day-to-day implementation of SEMP's by contractors including compliance with all government rules and regulations; (iv) take necessary action for obtaining rights of way; (v) oversee environmental monitoring by contractors; (vi) Ensure that workers are paid and treated according to the labour legislations and ADB's SPS prohibited list requirements (vii) take corrective actions when necessary; (viii) submit monthly environmental monitoring reports to PMU; (ix) conduct continuous public outreach and awareness building related to environmental management; (x) address grievances brought about through the GRM in a timely manner; and (xi) organize an induction course for the training of contractors in environmental management to be delivered by PMSC consultants.
Deputy Engineer Cum Compliance Officer - GVMC	<ul style="list-style-type: none"> (i) Coordinate with Safeguard Manager and ensure all social/environmental requirements are met.
Environmental Engineer - GVMC	<ul style="list-style-type: none"> (i) include IEEs/EMPs in bidding documents and civil works contracts; (ii) review and approve SEMP's prepared by contractors; (iii) oversee day-to-day implementation of SEMP's by contractors including compliance with all government rules and regulations; (iv) take necessary action for obtaining rights of way; (v) oversee environmental monitoring by contractors; (vi) take corrective actions when necessary; (vii) submit monthly environmental monitoring reports to PMU; (viii) conduct continuous public outreach and awareness building related to environmental management; (ix) address grievances brought about through the GRM in a timely manner; and (x) organize an induction course for the training of contractors in environmental management to be delivered by PMSC consultants

94. **Project Management and Supervision Consultants.** The PMU and PIUs will be assisted by PMSC which will be staffed with environmental, health and safety, and social safeguard specialists to provide required assistance and regular progress report on safeguards implementation. The environmental specialist will have overall responsibility in implementation of environmental safeguards, including appropriate monitoring and reporting responsibilities. The PMSC environment specialist will provide support for both Project 1 and Project 2 subprojects. Key tasks and responsibilities of the PSMC environmental specialist is as follows:

- (i) Update the EARF as required;
- (ii) Update the IEEs including site- and subproject-specific EMPs for VCICDP subprojects ;Prepare the IEEs and EMPs for subproject components;
- (iii) Supervise EMP implementation;
- (iv) Prepare a monitoring report of final site- and subproject-specific EMPs and communicate with the stakeholders, including ADB on the progress, of the subprojects including environmental safeguards compliance;
- (v) Prepare semi-annual environmental safeguards compliance reports; and
- (vi) Support the implementing agencies in preparing periodic financing requests and necessary environmental safeguard reports for subsequent tranches.

- (vii) Establish a system to monitor environmental safeguards of the Project; prepare indicators for monitoring important parameters of safeguards;
- (viii) Ensure all requisite approvals and no objection certificates are in place to allow implementation, and that these are renewed in a timely manner where required;
- (ix) Ensure that provisions and conditions of all necessary permits, consents, NOCs, etc., are incorporated in the IEEs;
- (x) Take proactive action to anticipate the potential environmental impacts of the Project to avoid delays in implementation;
- (xi) Assist PIUs in the establishment of GRC for IEE implementation;
- (xii) Support the PIUs and PMU in the GRM implementation to address any grievances submitted in a timely manner and establish record keeping system for complaint and redressal status of the project;
- (xiii) Assist the PIUs and PMU in the project GRM mechanism and complaint solution;
- (xiv) Assist the PIUs and PMU for GRM record keeping for first tier complaint and redressed actions;
- (xv) Ensure that the relevant environmental mitigation measures specified in the updated EMP will be incorporated into bidding documents and approved by the ADB prior to the issuance of the invitation for bidding;
- (xvi) Closely monitor and supervise to ensure that all mitigation measures and monitoring requirements set out in the EMP are implemented and complied with throughout the project implementation, and when required, prepare or recommend necessary corrective actions to be taken and monitor its implementation;
- (xvii) Conduct regular monitoring and ensure that contractors and their subcontractors comply with labour legislations and ADB SPS Prohibited list requirements; ensure that workers are paid and treated according to the labor legislations
- (xviii) Provide on-the-job training programs to PIU staff involved in Project implementation for strengthening their capacity in managing and monitoring environmental safeguards; and
- (xix) Assist the PIUs' safeguards officer to sensitize the turnkey contractors on ADB SPS, EARF, and GRM during detailed design and civil works implementation.

95. **Civil works contracts and contractors.** IEEs including EMPs are to be included in bidding and contract documents and verified by the PIUs and PMU. The PMU and PIUs will ensure that bidding and contract documents include specific provisions requiring contractors to comply with: (i) all applicable laws and regulations relating to environment, health and safety; (ii) reinstate pathways, other local infrastructure, and agricultural land to at least to their pre-project condition upon the completion of construction; (iii) all applicable labor laws and core labor standards on (a) prohibition of child labor as defined in national legislation, international treaties for construction and maintenance activities; (b) equal pay for equal work of equal value regardless of gender, ethnicity, or caste; (c) no discrimination in respect of employment and occupation; (d) allow freedom of association and effectively recognize the right to collective bargaining, and (e) elimination of forced labor; and (iv) the requirement to disseminate information on sexually transmitted diseases, including HIV/AIDS, to employees and local communities surrounding the project sites.

96. The contractor will be required to appoint a full-time Environment, Health and Safety (EHS) supervisor on-site to implement the EMP. Prior to start of construction, Contractor will be required to prepare and submit to PIU, for review and approval. a Site-specific EMP (SEMP). No works can commence until SEMP is approved by PIUPMU. Contractors will carry out all environmental mitigation and monitoring measures outlined in EMP, approved SEMP and their contracts. The contractor will be required to undertake day-to-day monitoring of the SEMP implementation and

submit reports to the PIU on a monthly basis. A copy of the EMP/approved SEMP will always be kept on-site during the construction period. Non-compliance with, or any deviation from, the conditions set out in the EMP/SEMP constitutes a failure in compliance and will require corrective actions. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites. Key responsibilities of the EHS supervisor are:

- (i) Prepare SEMP and submit to PMU/PIU for approval prior to start of construction;
- (ii) Ensure implementation of SEMP and report to PIU/PMSC on any new or unanticipated impacts; seek guidance from the PMU/PIU/PMSC to address the new or unanticipated impact in accordance with the EARF, and ADB SPS;
- (iii) Ensure that necessary pre-construction and construction permits are obtained;
- (iv) Conduct orientation and daily briefing sessions to workers on environment, health and safety;
- (v) Ensure that appropriate worker facilities are provided at the workplace and labor camps as per the contractual provisions;
- (vi) Carry out site inspections on a regular basis and prepare site-inspection checklists/reports;
- (vii) Record EHS incidents and undertake remedial actions;
- (viii) Conduct environmental monitoring (air, noise, etc.,) as per the monitoring plan
- (ix) Prepare monthly EMP monitoring reports and submit to PIU;
- (x) Comply with labour legislations, and ensure that subcontractors also implement labor legislations requirements, through cascading of requirements to subcontractors—HR policy, labor management requirements, any worksite specific grievance redress mechanism.
- (xi) Work closely with PIU Safeguards Officer and PMDSC Environmental Engineer to ensure communities are aware of project-related impacts, mitigation measures, and GRM; and
- (xii) Coordinate with the PIU and PMDSC on any grievances received and ensure that those are addressed in an effective and timely manner.

Table 10: Institutional Roles & Responsibility: Environmental Safeguards

Phase	PMU / PIUs	PMSC	ADB
Appraisal stage of all Subprojects under the investment program	PMU / PIUs to review the REA checklists and draft EIA/IEE. PMU / PIUs to submit draft EIA/IEE to ADB for review and approval. PMU / PIUs to disclose on its website the approved EIA/IEE. PMU / PIUs to ensure disclosure of information throughout the duration of the subproject.	PMSC to conduct REA for each subproject using checklists and to prepare EIA/IEE	ADB to review the REA checklists and reconfirm the categorization. ADB will review and approve EIA reports (Category A) and IEE reports (Category B) subprojects. ADB to disclose on its website the submitted EIA/IEE report.

Detailed Design Phase of all Subprojects under the investment program	PMU / PIUs with the assistance of PMSC to incorporate the EMP, environmental mitigation and monitoring measures into contract documents. PMU / PIUs to obtain all applicable consents/permits/clearances PMU to submit to ADB final IEE for approval and disclosure at ADB website.	PMSC to revise the IEE and EMP in accordance with detailed design changes if warranted. PMSC to ensure incorporation of EMP in bid documents and contracts. PMSC to prepare inventory of utilities to be affected by the subproject.	ADB will review and approve updated EIA reports (Category A) and IEE reports (Category B) subprojects. ADB to disclose on its website updated EIA/IEE report.
Pre-construction Phase of all Subprojects under the investment program	PMU / PIUs to conduct public consultation and disclosure during IEE process and comments will be reflected in the IEE report. PMU / PIU to monitor the disclosure and public consultation. PIU and PMSC to approve contractor's proposed locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes. PMU to submit to ADB in prescribed format semi-annual Environment Monitoring Report 6 months after Loan effective date.	PMSC to ensure statutory clearances and permits from government agencies/other entities are obtained prior to start of civil works. PMSC to ensure disclosure of information prior to start of civil works and throughout the duration of the construction period. PMSC to approve contractor's site-specific environmental plan (such as traffic management plan, waste management plan, locations for camp sites, storage areas, lay down areas, and other sites/plans specified in the EMP). PMSC to conduct	

Phase	PMU / PIUs	PMSC	ADB
		baseline environmental conditions and inventory of affected trees	
Construction Phase of all Subprojects under the investment program	PMU / PIUs will review 6-monthly monitoring and EMP implementation report including the status of Project compliance with statutory clearances and with relevant loan covenants and submit the 6-monthly report to ADB and seek permission to disclose the same in the investment program web site.	PMSC to monitor the implementation of mitigation measures by Contractor. PMSC to prepare monthly progress reports including a section on implementation of the mitigation measures (application of EMP and monitoring plan) PMSC (as per EMP) will conduct environmental quality monitoring during construction stage (ambient air and noise, and water quality). PMSC to prepare the six-monthly monitoring report on environment by focusing on the progress in implementation of the EMP and issues encountered and measures adopted, follow-up actions required, if any.	ADB to review the 6 monthly report, provide necessary advice if needed to the PMU and approve the same. ADB to disclose on its website environmental monitoring reports.
Pre-operation Phase (Commissioning and Defect Liability Period)	PMU / PIUs to review monitoring report of PMSC on post-construction activities by the contractors as specified in the EMP PMU / PIU to review applicable consents requirements	PMSC to apply for the CTOs prior to commissioning. PMSC to monitor and approve post-construction activities by the contractors as specified in the EMP.	
Operation Phase of all Subprojects under the investment program	PIUs to conduct monitoring, as specified in the environmental monitoring plan. APPCB to monitor the compliance of the standards regarding drinking water quality, ground water, ambient air, effluent quality from treatment plant, noise, as applicable.		

Notes: APPCB = Andhra Pradesh State Pollution Control Board, PMSC = Project Management Consultants, CTE = Consent to Establish, CTO = Consent to Operate, PMSC = Design and Supervision Consultant, EIA = Environmental Impact Assessment, EMP = Environmental Management Plan, IEE = Initial Environmental Examination, PMU = Project Management Unit; PIU = Project Implementation Unit; REA = Rapid Environmental Assessment

VII. INSTITUTIONAL CAPACITY AND DEVELOPMENT

97. The PMSC environmental safeguards specialist will be responsible for training PMU and PIUs on environmental awareness and management in accordance with both ADB and government requirements. Typical modules would be as follows: (i) sensitization; (ii) introduction to environment and environmental considerations in water supply and wastewater projects; (iii) review of IEEs and integration into the project detailed design; (iv). improved coordination within nodal departments; and (v) monitoring and reporting system. Specific modules customized for the available skill set will be devised after assessing the capabilities of the target participants and the requirements of the project. The contractors will be required to conduct environmental awareness and orientation of workers prior to deployment to work sites. The capacity building program will be participatory to the extent possible and will employ variety approaches to be more effective (such as learning by doing, role playing, group exercises, on-the-job training, etc.). Trainings during Project 1 implementation have been conducted and details reported in the semi-annual monitoring reports. Similarly for Project 2 subprojects also, trainings shall be conducted and reported in the SEMRs. A proposed training program along with the frequency of sessions, is presented in Table 11.

Table 11: Training Program for Environmental Management

Description	Contents	Schedule	Participants
Pre-construction stage			
Orientation workshop	Module 1 – Orientation - ADB Safeguard Policy Statement - Government of India Environmental Laws and Regulations	1/2 day (at Vijaywada (50 persons)	PMU, and PIUs – APRDC, APIIC, officials involved in project implementation
Description	Contents	Schedule	Participants
	Module 2 – Environmental Assessment Process - ADB environmental process, identification of impacts and mitigation measures, formulation of an environmental management plan (EMP), implementation, and monitoring requirements - Review of environmental assessment report to comply with ADB requirements - Incorporation of EMP into the project design and contracts	1/2 day (at Vijaywada (50 persons)	PMU, and PIUs – APRDC, APIIC, officials involved in project implementation.
Construction stage			

Orientation program/ workshop for contractors and supervisory staff	<ul style="list-style-type: none"> - Roles and responsibilities of officials/contractors/consultants towards protection of environment - Environmental issues during construction - Implementation of EMP - Monitoring of EMP implementation - Reporting requirements 	1 day (at Subproject locations) (15 persons)	PMU PIUs Contractors
Experiences and best practices sharing	<ul style="list-style-type: none"> - Experiences on EMP implementation – issues and challenges - Best practices followed 	1 day on a regular period to be determined by PMU, PIUs, and PMSC (at Vijaywada / Visakhapatnam) (50 persons)	PMU PIUs Contractors

ADB = Asian Development Bank; EMP = Environmental Management Plan; PIU = Project Implementation Unit; PMU = Project Management Unit; PMSC = Design and Supervision Consultant; APRDC=Andhra Pradesh Road Development Corporation; APIIC= Andhra Pradesh Industrial & Infrastructure Corporation; AP Transco=Andhra Pradesh Transmission Corporation; GVMC=Greater Vishakhapatnam Municipal Corporation

98. Under output 3 which will enhance sustainable and green industrial development through establishment of model green industrial corridor operational guidelines; development of disaster risk management plan to strengthen industrial cluster resilience, and formulation of a plan for the sustainable operation and maintenance of start-up industrial clusters. As part of these, institutional strengthening of APIIC, particularly at industrial park level, will be suggested with an aim to: promote environmental sustainability; ensure regulatory compliance in pollution control and encouraging international good practices, and encouraging to obtain ISO certification; facilitate redress of public grievances; facilitating awareness, training and capacity building programs for member industries and other stakeholders; and documenting, reporting and public disclosure of environmental performance etc.

B. Staffing and Budget

99. Costs required for implementing the EARF will cover the following activities:

- (i) Conducting environmental assessments of new subprojects, preparing and submitting reports, and public consultation and disclosure;
- (ii) Application for government regulatory consents, approvals; and
- (iii) Implementation of EMP and long-term surveys.

100. For budgeting purposes, it is assumed that all new subprojects will be classified by ADB as category B²⁵ (requiring IEE). Some subprojects may require a simpler environmental review (requiring due diligence report), but this is discounted for budgeting purposes.

101. Each of the IEEs prepared to date involved approximately 25 days of effort by an experienced environmental specialist, conducting the following activities: (i) site visit to assess

²⁵ Based on Project 1 subprojects. Project 2 subprojects are of similar nature and scale. No Category A subprojects as per ADB SPS will be considered under the project. The EARF budget provides 10% contingency to cover preparation of environmental assessment reports not included in the indicative budget.

environmental conditions and potential impacts of the scheme; (ii) liaison with Government agencies and others to obtain any environmental/social data that might be available locally (e.g. population figures, designated sites, etc.); (iii) consultation with the local community to inform them about the scheme and identify their views and concerns; (iv) assessment of impacts and development of mitigation; and (v) desk study and report preparation.

102. The infrastructure involved in each scheme is generally straightforward and will take between 1 and 2 years to build. Environmental monitoring during construction will also be straightforward and will involve periodic site observations and interviews with workers and others, plus checks of reports and other documents. This will be conducted by PMSC environment safeguard specialist assisted by the PMU Safeguards Coordinator. The PMSC environment safeguard specialist will prepare IEEs, or environmental reviews for new subprojects. The budget therefore includes the full cost of the environment specialist.

103. The cost of mitigation measures and surveys during construction will be incorporated into the contractor's costs, which will be binding on him for implementation. The surveys will be conducted by the contractors.

104. The operation phase mitigation measures are again of good operating practices, which will be the responsibility of the PIUs. The existing technical staff should be trained in new requirements and operation and maintenance. All monitoring during the operation and maintenance phase will be conducted by government regulatory agencies like APPCB as per their mandate therefore, there are no additional costs. The indicative costs of EARF implementation²⁶ for each PIUs are shown in Table 12.

Table 12: Indicative Cost of EARF Implementation – Project 2

Component	Description	Input (in person months)	Cost Per Unit (US\$)	Cost (US\$)	Source of Funds
A. Consultants Costs					
PMSC environmental safeguards specialist (based in PMU)	Responsible for environmental safeguards of the project	21 person months (spread over entire project implementation period)	\$2,500	\$52,500	Remuneration and budget for travel covered in the PMSC contract
PMSC Environmental Engineers (2 numbers, based in field/PIUs)	Responsible for environmental safeguards of the project	42 x 2 = 84 (full time input over entire project implementation period)	\$1,000	\$84,000	Remuneration and budget for travel covered in the PMSC contract
B. Administrative Costs					

²⁶ This is an indicative cost for each PIUs (APRDC, APTRANSCO, APIIC & GVMC). Total cost for EARF implementation for the VCICDP will be the addition of all the PIUs costs.

Legislation, permits and agreements, Utilities shifting, etc.	Costs for forest permission, tree plantation, etc.	Lump sum	\$50,000	\$50,000	Included in the overall project cost
					The approvals/ permits that are to be obtained by contractor at his own expense are not included here
C. Environmental Monitoring Costs					
Baseline monitoring prior to construction	During detailed design stage to establish existing environmental conditions	Lump sum	\$25,000	\$25,000	Included in the PMSC contract
	Before start of construction works	One sample each for noise, ambient air quality, receiving/adjacent body of water	\$3,000 per subproject	\$36,000	Contractor's cost
Monitoring during	Sampling sites	Noise, ambient	Contractor's	Not	Contractor's

Component	Description	Number	Cost Per Unit (US\$)	Cost (US\$)	Source of Funds
construction	near sensitive areas (schools, hospitals, places of	air quality, and water quality -	liability	applicable	Cost
	worship, historical/cultural areas)	monitoring points and frequency will be finalized before construction			
D. Other Costs					
Public consultations and information disclosure	Information disclosure and consultations during preconstruction and construction phase, including public awareness campaign through media	As per requirement	Lump sum	\$600,000	Covered under PMSC
Capacity building (PMSC & PMSC)	(i) Orientation workshop for officials involved in the project implementation on ADB Safeguard Policy Statement, Government of India environmental laws and regulations, and environmental assessment process; (ii) induction course for contractors, preparing them on EMP implementation and environmental monitoring requirements related to mitigation measures, and on taking immediate action to remedy	Module 1 — immediately upon engagement of the PMSC environmental safeguard specialist Module 2 — prior to award of civil works contracts (twice a year for 4 years) Module 3 — prior to start of Phase 2 and upon completion of the project	Module 1 - \$1,500 Module 2 - \$900 Module 3 - \$3,000	\$5,400	Covered under PMSC

Component	Description	Number	Cost Per Unit (US\$)	Cost (US\$)	Source of Funds
	unexpected adverse impacts or ineffective mitigation measures found during the course of implementation; and (iii) lessons learned information sharing				
GRC implementation	Costs involved in resolving complaints (meetings, consultations, communication, and reporting/information dissemination)	Lump sum	Part of administration cost of PIUs	\$3,000 per year	PIUs cost
Any unanticipated impact due to project implementation	Mitigation of any unanticipated impact arising during construction phase and defect liability period	Lump sum	Contractor's liability	As per insurance requirement	Contractor's insurance
Contingency	Costs involved not identified in the above items	Lump sum	Part of administration cost of PIUs	10% of total environmental safeguards budget per year	PIUs cost

PMU = Project Management Unit; PIU = Project Implementation Unit; PMSC = Design and Supervision Consultant

VIII. MONITORING AND REPORTING

105. DOI will monitor and measure the progress of EMP implementation. The monitoring activities will correspond with the project's risks and impacts. In addition to recording information on the work and deviation of work components from original scope, PMU, PIUs, and PMSC will undertake site inspections and document review to verify compliance with the EMP and progress toward the final outcome.

106. PIUs / PMSC will submit monthly monitoring and implementation reports to PMU, who will take follow-up actions, if necessary. DOI will submit semi-annual monitoring reports to ADB. The suggested monitoring report format is in Appendix 7. A construction site checklist is attached at Appendix 8, which is to be filled by the PMSC/PIUs supervising staff and attached to monthly reports. Subproject budgets will reflect the costs of monitoring and reporting requirements. For

projects likely to have significant adverse environmental impacts during operation, reporting will continue at the minimum on an annual basis. Monitoring reports will be posted in a location accessible to the public.

107. Compliance with loan covenants will be screened by the Department of Industries, Government of Andhra Pradesh.

108. ADB will review project performance against the DOI, GoAP, commitments as agreed in the legal documents. The extent of ADB's monitoring and supervision activities will be commensurate with the project's risks and impacts. Monitoring and supervising social and environmental safeguards will be integrated into the project performance management system. ADB will monitor projects on an ongoing basis until a project completion report is issued. ADB will carry out the following monitoring actions to supervise project implementation:

- (i) conduct periodic site visits for projects with adverse environmental or social impacts;
- (ii) conduct supervision missions with detailed review by ADB's safeguard specialists/officers or consultants for projects with significant adverse social or environmental impacts;
- (iii) review the periodic monitoring reports submitted by EAs to ensure that adverse impacts and risks are mitigated, as planned and agreed with ADB;
- (iv) work with EAs to rectify to the extent possible any failures to comply with their safeguard commitments, as covenanted in the legal agreements, and exercise remedies to reestablish compliance as appropriate; and
- (v) prepare a project completion report that assesses whether the objective and desired outcomes of the safeguard plans have been achieved, taking into account the baseline conditions and the results of monitoring.

Appendix 1: List of Subprojects under Project 1 & 2

VCICDP – Subprojects being implemented under Project 1

S No	Package No	Subproject Name
1	VCICDP- APIIC/01	Construction of 1MLD Common Effluent Treatment plant (CETP) at Naidupeta Industrial cluster
2	VCICDP-APIIC/03	Augmenting utility services for Naidupeta Industrial cluster. [SWD, power, internal road and one stop Centre.
3	VCICDP- APIIC/04	Providing 21 MLD bulk water facility and summer storage in Naidupeta Industrial cluster.
4	VCICDP- APRDC/01	Upgrading & Rehabilitation of 'Samarlakota to Rajanagaram' Section of 'Kakinada – Rajanagaram' Road to '2 Lane Dual Carriageway Standard'
5	VCICDP- GVMC/02	Distribution Network improvements for NRW reduction and 24x7 supply in GVMC area
6	VCICDP- UCCRTF/04	Water shed development and Rejuvenation of Mudasarlova lake.
7	VCICDP- UCCRTF/05	Developing a 3MW Solar Energy Park at Mudasarlova/ Meghadri Gedda
8	VCICDP- UCCRTF/06	Converting 3 streets into non-vehicular zone
9	VCICDP- APTransco/01	Augmenting power distribution capacity for meeting Industry demand at Kapuleppada, Nakkapalle/ Chandanada and Achutapuram locations.
10	VCICDP- APTransco/03	Augmenting power distribution capacity for meeting Industry demand at Rachagunneri, Naidupeta and Yerpedu locations.

VCICDP – Proposed Subprojects under Project 2

S No	Package No	Subproject Name
1	APRDC 04	External Connectivity to Naidupeta Industrial Cluster Road Subproject
2	APRDC 05	External Connectivity to Routhusuramala Cluster Road Subproject
3	APRDC 06	External Connectivity to Nakappalli Industrial Cluster Road Subproject
4	APRDC 07	Atchuthapuram-Anakapalle Road Improvement Subproject
5	APIIC 06A	Development of Start-up Area of Chittoor Cluster
6	APIIC 08A	Development of Start-up Area of Rambilli Startup area
7	APIIC 09A	Development of Start-up Area of Nakapalli Cluster

Appendix 2: Environmental Standards

General Standards for Discharge of Environmental Pollutants (Wastewater)

S. No.	Parameter	Inland surface water	Public sewers	Land for irrigation
	2		3	
	.	(a)	(b)	(c)
1	Suspended solids mg/l, max.	100	600	200
2	Particle size of suspended solids	shall pass 850 micron IS Sieve	-	-
3	pH value	5.5 to 9.0	5.5 to 9.0	5.5 to 9.0
4	Temperature	shall not exceed 5oC above the receiving water temperature		
5	Oil and grease, mg/l max,	10	20	10
6	Total residual chlorine, mg/l max	1.0	-	-
7	Ammonical nitrogen N),mg/l, max.	50	50	-
8	Total kjeldahl nitrogen (as N); mg/l, max. mg/l, max.	100	-	-
9	Free ammonia (as NH ₃), mg/l,max.	5.0	-	-
10	Biochemical oxygen demand (3 days at 27oC), mg/l, max.	30	350	100
11	Chemical oxygen demand, mg/l, max.	250	-	-
12	Arsenic (as As).	0.2	0.2	0.2
13	Mercury (As Hg), mg/l, max.	0.01	0.01	-
14	Lead (as Pb) mg/l, max	0.1	1.0	-
15	Cadmium (as Cd) mg/l, max	2.0	1.0	-
16	Hexavalent chromium (as Cr + 6) mg/l, max.	0.1	2.0	-
17	Total chromium (as Cr) mg/l, max.	2.0	2.0	-
18	Copper (as Cu) mg/l,max.	3.0	3.0	-
19	Zinc (as Zn) mg/l, max.	5.0	15	-
20	Selenium (as Se)	0.05	0.05	-
21	Nickel (as Ni) mg/l, max.	3.0	3.0	-
22	Cyanide (as CN) mg/l, max.	0.2	2.0	0.2
23	Fluoride (as F) mg/l, max.	2.0	15	-
24	Dissolved phos- phates (as P),mg/l, max.	5.0	-	-

25	Sulphide (as S) mg/l,	2.0	-	-
----	-----------------------	-----	---	---

S. No.	Parameter	Inland surface water	Public sewers	Land for irrigation
	max.			
26	Phenolic compounds (as C ₆ H ₅ OH) mg/l, max.	1.0	5.0	-
27	Radioactive materials: (a) Alpha emitters micro curie mg/l, max. (b) Beta emitters micro curie mg/l	10-7 10-6	10-7 10-6	10-8 10-7
28	Bio-assay test	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent
29	Manganese	2 mg/l	2 mg/l	-
30	Iron (as Fe)	3mg/l	3mg/l	-
31	Vanadium (as V)	0.2mg/l	0.2mg/l	-
32	Nitrate Nitrogen	10 mg/l	-	-

Environmental Standards for Common Effluent Treatment Plants (CETP)
(as per the Environment (Protection) Rules, 1986 and as amended till date)

A. Inlet Effluent Quality for CETP

Parameter	Concentration in mg/l
pH	5.5 – 9.0
Temperature °C	45
Oil & Grease	20
Phenolic Compounds (as C ₆ H ₅ OH)	5.0
Ammonical Nitrogen (as N)	50
Cynide (as CN)	2.0
Chromium hexavalent (as Cr+6)	2.0
Chromium (total)(as Cr)	2.0
Copper (as Cu)	3.0
Lead (as Pb)	1.0
Nickel (as Ni)	3.0
Zinc (as Zn)	15
Arsenic (as As)	0.2
Mercury (as Hg)	0.01
Cadmium (as Cd)	1.0
Selenium (as Se)	0.05
Fluoride (as F)	15
Boron (as B)	2.0
Radioactive Materials	
Alpha emitters, Hc/ml	10-7
Beta emitters, He/ml	10-8

Note: 1. These Standards apply to the small-scale industries, i.e. total discharge up to 25 KL/Day. 2. For each CETP and its constituent units, the State Board will prescribe standards as per the local needs and conditions; these can be more stringent than those prescribed above. However, in case of clusters of units, the State Board with the concurrence of CPCB in writing, may prescribe suitable limits.

B. Treated Effluent Quality of CETP

Parameter	Into inland surface waters	On land for Irrigation	Into Marine Coastal areas
	(a)	(b)	(c)
pH	5.5 - 9.0	5.5 – 9.0	5.5 – 9.0
BOD1[3days at 27°C]	30	100	100
Oil & Grease	10	10	20
Temperature	Shall not exceed 40°C in any section of the stream within 15 metres downstream from the effluent outlet	-	45°C at the point of discharge.
Suspended Solids	100	200	a) For process wastewater – 100 b) For cooling water effluents 10 percent above total suspended
			matter of effluent coolingwater
Dissolved Solids (inorganic)	2100	2100	-
Total residual chlorine	1.0	-	1.0
Ammonical nitrogen (as N)	50	-	50
Kjeldahl nitrogen (as N)	100	-	100
Chemical Oxygen Demand	250	-	250
Arsenic (as As)	0.2	0.2	0.2
Mercury (as Hg)	0.01	-	0.01
Lead (as Pb)	0.1	-	1.0
Cadmium (as Cd)	1.0	-	2.0
Total Chromium (asCr)	2.0	-	2.0
Copper (as Cu)	3.0	-	3.0
Zinc (as Zn)	5.0	-	15
Selenium (as Se)	0.05	-	0.05
Nickel (as Ni)	3.0	-	5.0
Boron (as B)	2.0	2.0	-
Percent Sodium	-	60	-
Cynide (as CN)	0.2	0.2	0.2
Chloride (as Cl)	1000	600	-
Fluoride (as F)	2.0	-	15

Parameter	Into inland surface waters	On land for Irrigation	Into Marine Coastal areas
Sulphate (as SO ₄)	1000	1000	-
Sulphide (as S)	2.8	-	5.0
Pesticides	Absent	Absent	Absent
Phenolic compounds (as C ₆ H ₅ OH)	1.0	-	5.0

Concentration in mg/l except pH & Temperature

Note: All efforts should be made to remove colour and unpleasant odour as far as possible.

1 Substituted by Rule 2 of the Environment (Protection) Amendment Rules, 1996 notified by G.S.R.176(E), dated 2.4.1996 may be read as BOD (3 days at 27°C) wherever BOD 5 days 20°C occurred.

National Ambient Air Quality Standards

Pollutant	Concentration in ambient Air			
	Average	Industrial, Residential and other rural area	Ecologically Sensitive Area (Notified by Central Government)	Methods of Measurement
SO ₂ ug/m ³	Annual*	50	20	- Improved West and Geake
	24 hours**	80	80	- Ultraviolet Fluorescence
NO _x ug/m ³	Annual*	40	30	- Modified Jacob and Hochheiser
	24 hours**	80	80	- Chemiluminescence
PM ₁₀ ug/m ³	Annual*	60	60	- Gravimetric
	24 hours**	100	100	- TEOM - Beta Attenuation
PM _{2.5} ug/m ³	Annual*	40	40	- Gravimetric
	24 hours**	60	60	- TEOM - Beta Attenuation
Ozone (O ₃) ug/m ³	8 Hours**	100	100	- UV Photometric
	1 Hour**	180	180	- Chemiluminescence - Chemical Method
Lead ug/m ³	Annual*	0.50	0.50	- AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper
	24 hours**	1.0	1.0	- ED-XRF using Teflon filter
CO ug/m ³	8 Hours**	2000	2000	- Non Dispersive Infra Red Spectroscopy
	1 Hour**	4000	4000	
NH ₃ ug/m ³	Annual*	100	100	- Chemiluminescence
	24 hours**	400	400	- Indophenol blue method
Benzene (C ₆ H ₆) ug/m ³	Annual*	05	05	- Gas Chromatography based Continuous Analyzer - Adsorption followed by GC Analysis
Benzo Pyrene- Particulate Phase only	Annual*	01	01	- Solvent extraction followed by HPLC/GC analysis

Pollutant	Concentration in ambient Air			
	Average	Industrial, Residential and other rural area	Ecologically Sensitive Area (Notified by Central Government)	Methods of Measurement
ug/m ³				
Arsenic ng/m ³	Annual*	06	06	- AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper
Nickel ng/m ³	Annual*	20	20	- AAS/ICP Method after sampling on EPM 2000 or equivalent filter paper

Source: Gazette of India, Part II-Section -3-Subsection (i)

*Annual Arithmetic Mean of minimum 104 measurements in a year taken twice a week 24-hourly at uniform interval.

**24-hourly / 8-hourly values or 0.1 hourly monitored values shall be complied with 98% of the time in the year.

However, 2% of the time, it may exceed but not on two consecutive days.

Ambient Noise Standards

Area Code	Category of Zones	Limits of Leq in dB(A)	
		Day time*	Night time*
A	Industrial	75	70
B	Commercial	65	55
C	Residential	55	45
D	Silence Zone **	50	40

Gazette Notification dated 26th December 1989. It is based on the weighted equivalent noise level (Leq).

* Day time is from 6 am to 9 pm whereas night time is from 9 pm to 6 am

** Silence zone is defined as area up to 100 meters around premises of hospitals, educational institutions and courts. Use of vehicles horns, loud speakers and bursting of cracking are banned in these zones. These noise standards have been given the status of statutory norms vide Noise Pollution (Regulation and Control) Rules, 2000. However, these rules have changed the periods for 'Day Time' and 'Night Time' to 6 a.m. to 10 p.m. and 10 p.m. to 6 am respectively.

Surface Water Quality Classification Criteria

Designated-Best-Use	Class of water	Criteria
Drinking Water Source without conventional treatment but after disinfection	A	Total Coliforms Organism MPN/100ml shall be 50 or less pH between 6.5 and 8.5 Dissolved Oxygen 6mg/l or more Biochemical Oxygen Demand 5 days 20°C 2mg/l or less
Outdoor bathing (Organized)	B	Total Coliforms Organism MPN/100ml shall be 500 or less pH between 6.5 and 8.5 Dissolved Oxygen 5mg/l or more Biochemical Oxygen Demand 5 days 20°C 3mg/l or less

Drinking water source after conventional treatment and disinfection	C	Total Coliforms Organism MPN/100ml shall be 5000 or less pH between 6 to 9 Dissolved Oxygen 4mg/l or more Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Propagation of Wildlife and Fisheries	D	pH between 6.5 to 8.5 Dissolved Oxygen 4mg/l or more Free Ammonia (as N) 1.2 mg/l or less
Irrigation, Industrial Cooling, Controlled Waste disposal	E	pH between 6.0 to 8.5 Electrical Conductivity at 25°C micro mhos/cm Max. 2250 Sodium absorption Ratio Max. 26 Boron Max. 2mg/l

Source: Central Pollution Control Board
MPN = Most Probable Number

Vehicle Exhaust Emission Norms

1. Passenger Cars

Norms	CO (g/km)	HC+ NOx(g/km)
1991 Norms	14.3-27.1	2.0(Only HC)
1996 Norms	8.68-12.40	3.00-4.36
1998 Norms	4.34-6.20	1.50-2.18
India stage 2000 norms	2.72	0.97
Bharat stage-II	2.2	0.5
Bharat Stage-III	2.3	0.35(combined)
Bharat Stage-IV	1.0	0.18(combined)

2. Heavy Diesel Vehicles

Norms	CO (g/kmhr)	HC (g/kmhr)	NOx (g/kmhr)	PM(g/kmhr)
1991 Norms	14	3.5	18	-
1996 Norms	11.2	2.4	14.4	-
India stage 2000 norms	4.5	1.1	8.0	0.36
Bharat stage-II	4.0	1.1	7.0	0.15
Bharat Stage-III	2.1	1.6	5.0	0.10
Bharat Stage-IV	1.5	0.96	3.5	0.02

Source: Central Pollution Control Board

CO = Carbon Monoxide; g/kmhr = grams per kilometer-hour; HC = Hydrocarbons; NOx = oxides of nitrogen; PM = Particulates Matter

During the design, construction, and operation of the project the PMU and PIUs 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 Government of India regulations differ from these levels and measures, the PMU and PIUs will achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, the PMU and PIUs will provide full and detailed justification for any proposed alternatives that are consistent with the requirements presented in ADB SPS.

WHO Ambient Air Quality Guidelines

Table 1.1.1: WHO Ambient Air Quality Guidelines ^{7, 8}		
	Averaging Period	Guideline value in $\mu\text{g}/\text{m}^3$
Sulfur dioxide (SO_2)	24-hour	125 (Interim target-1) 50 (Interim target-2) 20 (guideline)
	10 minute	500 (guideline)
Nitrogen dioxide (NO_2)	1-year	40 (guideline)
	1-hour	200 (guideline)
Particulate Matter PM_{10}	1-year	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)
	24-hour	150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
Particulate Matter $\text{PM}_{2.5}$	1-year	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline)
	24-hour	75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
Ozone	8-hour daily maximum	160 (Interim target-1) 100 (guideline)

World Bank Group's EHS Noise Level Guidelines

Table 1.7.1- Noise Level Guidelines ⁵⁴		
Receptor	One Hour L_{Aeq} (dBA)	
	Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Residential; institutional; educational ⁵⁵	55	45
Industrial; commercial	70	70

Appendix 3: REA Checklists

Rapid Environmental Assessment (REA) Checklist (ROADS & HIGHWAYS)

Instructions:

- (i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES), for endorsement by Director, RSES and for approval by the Chief Compliance Officer.
- (ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
- (iii) 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.

Country/Project Title

Sector Division:

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Cultural heritage site			
▪ Protected Area			
▪ Wetland			
▪ Mangrove			
▪ Estuarine			
▪ Buffer zone of protected area			
▪ Special area for protecting biodiversity			
B. Potential Environmental Impacts Will the Project cause...			
▪ encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?			
▪ encroachment on precious ecology (e.g., sensitive or protected areas)?			

Screening Questions	Yes	No	Remarks
▪ alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?			
▪ deterioration of surface water quality due to siltrunoff and sanitary wastes from worker-based camps and chemicals used in construction?			
▪ increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?			
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation during project construction and operation?			
▪ noise and vibration due to blasting and other civil works?			
▪ dislocation or involuntary resettlement of people?			
▪ dislocation and compulsory resettlement of people living in right-of-way?			
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?			
▪ other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?			
▪ hazardous driving conditions where construction interferes with pre-existing roads?			
▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases (such as STI's and HIV/AIDS) from workers to local populations?			
▪ creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents?			
▪ accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials?			

Screening Questions	Yes	No	Remarks
<ul style="list-style-type: none"> increased noise and air pollution resulting from traffic volume? 			
<ul style="list-style-type: none"> increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road? 			
<ul style="list-style-type: none"> social conflicts if workers from other regions or countries are hired? 			
<ul style="list-style-type: none"> large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)? 			
<ul style="list-style-type: none"> 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 construction and operation? 			
<ul style="list-style-type: none"> community safety risks due to both accidental and natural causes, 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. 			

Rapid Environmental Assessment (REA) Checklist (Sewage Treatment)

Instructions:

- (i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by the Director, RSES and for approval by the Chief Compliance Officer.
- (ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
- (iii) 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.

Country/Project Title

Sector Division:

Screening Questions	Yes	No	Remarks
B. 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			
A. Potential Environmental Impacts Will the Project cause...			

Screening Questions	Yes	No	Remarks
▪ impairment of historical/cultural monuments/areas and loss/damage to these sites?			
▪ interference with other utilities and blocking of access to buildings; nuisance to neighboring areas due to noise, smell, and influx of insects, rodents, etc.?			
▪ dislocation or involuntary resettlement of people?			
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?			
▪ impairment of downstream water quality due to inadequate sewage treatment or release of untreated sewage?			
▪ overflows and flooding of neighboring properties with raw sewage?			
▪ environmental pollution due to inadequate sludge disposal or industrial waste discharges illegally disposed in sewers?			
▪ noise and vibration due to blasting and other civil works?			
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, and biological hazards during project construction and operation?			
▪ discharge of hazardous materials into sewers, resulting in damage to sewer system and danger to workers?			
▪ inadequate buffer zone around pumping and treatment plants to alleviate noise and other possible nuisances, and protect facilities?			
▪ road blocking and temporary flooding due to land excavation during the rainy season?			
▪ noise and dust from construction activities?			
▪ traffic disturbances due to construction material transport and wastes?			
▪ temporary silt runoff due to construction?			

Screening Questions	Yes	No	Remarks
▪ hazards to public health due to overflow flooding, and groundwater pollution due to failure of sewerage system?			
▪ deterioration of water quality due to inadequate sludge disposal or direct discharge of untreated sewage water?			
▪ contamination of surface and ground waters due to sludge disposal on land?			
▪ health and safety hazards to workers from toxic gases and hazardous materials which maybe contained in confined areas, sewage flow and exposure to pathogens in untreated sewage and unstabilized sludge?			
▪ large population increase during project construction and operation that causes increased burden on social infrastructure (such as sanitation system)?			
▪ social conflicts between construction workers from other areas and community workers?			
▪ 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 construction and operation?			
▪ 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?			

Rapid Environmental Assessment (REA) Checklist (General)

Instructions:

- (i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES), for endorsement by Director, RSES and for approval by the Chief Compliance Officer.
- (ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
- (iii) 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.

Country/Project Title

Sector Division:

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Cultural heritage site			
▪ Legally protected Area (core zone or buffer zone)			
▪ Wetland			
▪ Mangrove			
▪ Estuarine			
▪ Special area for protecting biodiversity			
C. Potential Environmental Impacts Will the Project cause...			
▪ impairment of historical/cultural areas; disfiguration of landscape or potential loss/damage to physical cultural resources?			
▪ disturbance to precious ecology (e.g. sensitive or protected areas)?			

Screening Questions	Yes	No	Remarks
▪ alteration of surface water hydrology of waterways resulting in increased sediment in streams affected by increased soil erosion at construction site?			
▪ deterioration of surface water quality due to siltrunoff and sanitary wastes from worker-based camps and chemicals used in construction?			
▪ increased air pollution due to project constructionand operation?			
▪ noise and vibration due to project construction oroperation?			
▪ involuntary resettlement of people? (physical displacement and/or economic displacement)			
▪ disproportionate impacts on the poor, women andchildren, Indigenous Peoples or other vulnerable groups?			
▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases (such asSTI's and HIV/AIDS) from workers to local populations?			
▪ creation of temporary breeding habitats fordiseases such as those transmitted by mosquitoes and rodents?			
▪ social conflicts if workers from other regions orcountries are hired?			
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?			
▪ risks to community health and safety due to thetransport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?			

Screening Questions	Yes	No	Remarks
▪ community safety risks due to both accidental and natural causes, 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?			
▪ generation of solid waste and/or hazardous waste?			
▪ use of chemicals?			
▪ generation of wastewater during construction or operation?			

Rapid Environmental Assessment (REA) Checklist (Urban Development)

Instructions:

- (i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by the Director, RSES and for approval by the Chief Compliance Officer.
- (ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
- (iii) 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.

Country/Project Title

Sector Division:

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...			

Screening Questions	Yes	No	Remarks
▪ 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 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?			

Screening Questions	Yes	No	Remarks
▪ hazards to public health due to ambient, household and occupational pollution, 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?			

Rapid Environmental Assessment (REA) Checklist (Power Transmission)

Instructions:

- (i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to Environment and Safeguards Division (RSES) for endorsement by Director, RSES and for approval by the Chief Compliance Officer.
- (ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
- (iii) 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.

Country/Project Title:

Sector Division:

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Cultural heritage site			
▪ Protected Area			
▪ Wetland			
▪ Mangrove			
▪ Estuarine			
▪ Buffer zone of protected area			
▪ Special area for protecting biodiversity			
B. Potential Environmental Impacts Will the Project cause...			
▪ encroachment on historical/cultural areas, disfiguration of landscape and increased waste generation?			
▪ encroachment on precious ecosystem (e.g. sensitive or protected areas)?			
▪ alteration of surface water hydrology of waterways crossed by roads and resulting in increased sediment in streams affected by increased soil erosion at the construction site?			

Screening Questions	Yes	No	Remarks
▪ damage to sensitive coastal/marine habitats by construction of submarine cables?			
▪ deterioration of surface water quality due to silt runoff, sanitary wastes from worker-based camps and chemicals used in construction?			
▪ increased local air pollution due to rock crushing, cutting and filling?			
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?			
▪ chemical pollution resulting from chemical clearing of vegetation for construction site?			
▪ noise and vibration due to blasting and other civil works?			
▪ dislocation or involuntary resettlement of people?			
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?			
▪ social conflicts relating to inconveniences in living conditions where construction interferes with pre-existing roads?			
▪ hazardous driving conditions where construction interferes with pre-existing roads?			
▪ creation of temporary breeding habitats for vectors of disease such as mosquitoes and rodents?			
▪ dislocation and compulsory resettlement of people living in right-of-way of the power transmission lines?			
▪ environmental disturbances associated with the maintenance of lines (e.g., routine control of vegetative height under the lines)?			
▪ facilitation of access to protected areas in case corridors traverse protected areas?			
▪ disturbances (e.g., noise and chemical pollutants) if herbicides are used to control vegetative height?			

Screening Questions	Yes	No	Remarks
▪ large population influx during project construction and operation that cause 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?			
▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?			
▪ risks to community safety associated with maintenance of lines and related facilities?			
▪ community health hazards due to electromagnetic fields, land subsidence, lowered groundwater table, and salinization?			
▪ 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 construction and operation?			
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (e.g., high voltage wires, and transmission towers and lines) 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

Country/Project Title:

Sector:

Subsector:

Division/Department:

Screening Questions		Score	Remarks ²⁷
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.

²⁷ If 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.

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

Other
Comments:_

Prepared by: _____

Appendix 4: Outline of an ADB Environmental Assessment Report

An environmental assessment report is required for all environment category A and B projects. Its level of detail and comprehensiveness is commensurate with the significance of potential environmental impacts and risks. A typical EIA report contains the following major elements, and an IEE may have a narrower scope depending on the nature of the project. The substantive aspects of this outline will guide the preparation of environmental impact assessment reports, although not necessarily in the order shown.

A. Executive Summary

This section describes concisely the critical facts, significant findings, and recommended actions.

B. Policy, Legal, and Administrative Framework

This section discusses the national and local legal and institutional framework within which the environmental assessment is carried out. It also identifies project-relevant international environmental agreements to which the country is a party.

C. Description of the Project

This section describes the proposed project; its major components; and its geographic, ecological, social, and temporal context, including any associated facility required by and for the project (for example, access roads, power plants, water supply, quarries and borrow pits, and spoil disposal). It normally includes drawings and maps showing the project's layout and components, the project site, and the project's area of influence.

D. Description of the Environment (Baseline Data)

This section describes relevant physical, biological, and socioeconomic conditions within the study area. It also looks at current and proposed development activities within the project's area of influence, including those not directly connected to the project. It indicates the accuracy, reliability, and sources of the data.

E. Anticipated Environmental Impacts and Mitigation Measures

This section predicts and assesses the project'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 [Appendix 2, para. 6 of ADB SPS]), and physical cultural resources in the project's area of influence, in quantitative terms to the extent possible; identifies mitigation measures and any residual negative impacts that cannot be mitigated; explores opportunities for enhancement; identifies and estimates the extent and quality of available data, key data gaps, and uncertainties associated with predictions and specifies topics that do not require further attention; and examines global, transboundary, and cumulative impacts as appropriate.

F. Analysis of Alternatives

This section examines alternatives to the proposed project site, technology, design, and operation including the no project alternative in terms of their potential environmental suitability under local conditions; and their institutional, training, and monitoring requirements. It also states the basis for selecting the particular project design proposed and, justifies recommended emission levels and approaches to pollution prevention and abatement.

G. Information Disclosure, Consultation, and Participation

This section:

- describes the process undertaken during project design and preparation for engaging stakeholders, including information disclosure and consultation with affected people and other stakeholders;
- summarizes comments and concerns received from affected people and other stakeholders and how these comments have been addressed in project design and mitigation measures, with special attention paid to the needs and concerns of vulnerable groups, including women, the poor, and Indigenous Peoples; and
- describes 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 project implementation.

H. Grievance Redress Mechanism

This section describes the grievance redress framework (both informal and formal channels), setting out the time frame and mechanisms for resolving complaints about environmental performance.

I. Environmental Management Plan

This section deals with the set of mitigation and management measures to be taken during project implementation to avoid, reduce, mitigate, or compensate for adverse environmental impacts (in that order of priority). It may include multiple management plans and actions. It includes the following key components (with the level of detail commensurate with the project's impacts and risks):

- (i) Mitigation:
 - identifies and summarizes anticipated significant adverse environmental impacts and risks;
 - describes 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
 - provides links to any other mitigation plans (for example, for involuntary resettlement, Indigenous Peoples, or emergency response) required for the project.
- (ii) Monitoring:
 - describes 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
 - describes 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:
 - specifies the implementation schedule showing phasing and coordination with overall project implementation;
 - describes 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
 - estimates capital and recurrent costs and describes sources of funds for implementing the environmental management plan.
- (iv) Performance indicators: describes 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.

J. Conclusion and Recommendation

This section provides the conclusions drawn from the assessment and provides recommendations.

Appendix 5: Outline of Due Diligence Report

Executive Summary

- I. Introduction
 - A. Background
 - B. Objective of the Subproject
 - C. Categorization and Justification for DDR
- II. Subproject Description
 - A. Present Status
 - B. Need for the Subproject
 - C. Components of the Subproject
- II. Potential Impacts and Mitigation Measures
- III. Contractor Requirement for Environmental Management
- IV. Grievance Redress Mechanism
- VI. Conclusion and Recommendations

Appendices

REA Checklist

Location Map

Site Layout — showing proposed infrastructure, boundaries, and if any existing facilities/trees/etc.

Site Photographs

Appendix 6: Records of Public Consultation

The following table is the suggested format for recording the minutes of the public consultations conducted for the project.

Date and Venue of Public Consultation	Number of attendees	Issues /concerns raised during the public consultation	Response of the EA/IA on how to address the issues and concerns

Attachments:

Attendance sheets

Photo documentation

Appendix 7: Sample Annual Environmental Monitoring Report Template

This template must be included as an appendix in the IEE that will be prepared for EACH sub-project. It can be adapted to the specific subproject as necessary.

I. Introduction

- Overall project description and objectives
- Description of subprojects
- Environmental category of the subprojects
- Details of site personnel and/or consultants responsible for environmental monitoring
- Overall project and subproject progress and status

No.	Subproject Name	Status of Subproject				List of Works	Progress of Works
		Design	Preconstruction	Construction	Operational Phase		
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

II. Compliance status with national/state/local statutory environmental requirements

No.	Subproject Name	Statutory Environmental Requirements	Status of Compliance	Action Required

III. Compliance status with environmental loan covenants

No. (List Schedule and Paragraph Number of Loan Agreement)	Covenant	Status of Compliance	Action Required

IV. COMPLIANCE STATUS WITH THE ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

- a. Provide the monitoring results as per the parameters outlined in the EMP. Append supporting documents where applicable, including environmental site inspection reports.
- b. There should be reporting on the following items which can be incorporated in the checklist of routine environmental site inspection reports, followed with a summary in the semi-annual report send to ADB. Visual

assessment and review of relevant site documentation during routine site inspection need to note and record the following:

- what are the dust suppression techniques followed for site, and if any dust was noted to escape the site boundaries;
- if muddy water was escaping site boundaries, or muddy tracks were seen on adjacent roads;
- adequacy of type of erosion and sediment control measures installed on-site, condition of erosion and sediment control measures, including if these were intact following heavy rain;
- are there designated areas for concrete works and refueling;
- are there spill kits on site, and if there are site procedure for handling emergencies;
- is there any chemical stored on site and what is the storage condition;
- are there any dewatering activities, if yes, where is the water being discharged;
- how are the stockpiles being managed;
- how are solid and liquid waste being handled on-site;
- review of the complaint management system; and
- checking if there are any activities being undertaken outside of working hours, and how that is being managed.

Summary Monitoring Table

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum, those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
Design Phase						
Pre-construction Phase						
Construction Phase						
Operational Phase						

Overall Compliance with EMP

No.	Subproject Name	EMP Part of Contract Documents (Y/N)	EMP Being Implemented (Y/N)	Status of Implementation (Excellent/ Satisfactory/ Partially Satisfactory/ Below Satisfactory)	Action Proposed and Additional Measures Required

v. APPROACH AND METHODOLOGY FOR ENVIRONMENTAL MONITORING OF THE PROJECT

Brief description on the approach and methodology used for environmental monitoring of each subproject

vi. MONITORING OF ENVIRONMENTAL IMPACTS ON PROJECT SURROUNDINGS (AMBIENT AIR, WATER QUALITY, AND NOISE LEVELS)

- Brief discussion on the basis for monitoring
- Indicate type and location of environmental parameters to be monitored
- Indicate the method of monitoring and equipment to be used
- Provide monitoring results and an analysis of results in relation to baseline data and statutory requirements

As a minimum the results should be presented as per the tables below.

Air Quality Results

Site No.	Date of Testing	Site Location	Parameters (Government Standards)		
			PM ₁₀ µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³

Site No.	Date of Testing	Site Location	Parameters (Monitoring Results)		
			PM ₁₀ µg/m ³	SO ₂ µg/m ³	NO ₂ µg/m ³

Water Quality Results

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)					
			pH	Conductivity µS/cm	BOD mg/l	TSS mg/l	TN mg/l	TP mg/l

Site No.	Date of Sampling	Site Location	Parameters (Monitoring Results)					
			pH	Conductivity μS/cm	BOD mg/l	TSS mg/l	TN mg/l	TP mg/l

Noise Quality Results

Site No.	Date of Testing	Site Location	LA _{eq} (dBA) (Government Standard)	
			Daytime	Nighttime

Site No.	Date of Testing	Site Location	LA _{eq} (dBA) (Monitoring Results)	
			Daytime	Nighttime

VII. SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS

- Summary of follow up time-bound actions to be taken within a set timeframe.

APPENDIXES

- Photos
- Summary of consultations
- Copies of environmental clearances and permits
- Sample of environmental site inspection report
- Other

SAMPLE ENVIRONMENTAL SITE INSPECTION REPORT

Project Name
Contract Number

NAME: _____

DATE: _____

TITLE: _____

DMA: _____

LOCATION: _____

GROUP: _____

WEATHER CONDITION: _____

INITIAL _____

SITE _____

CONDITION: _____

CONCLUDING SITE CONDITION:

Satisfactory_____Unsatisfactory_____Incident_____Resolved_____Unresolved

INCIDENT:

Nature of incident:

Intervention steps:

Incident issues: Resolution	Project activity stage	Survey	
		Design	
		Implementation	
		Pre-commissioning	
		Guarantee period	

Inspection

Emissions	Waste minimization		
Air quality	Reuse and recycling		
Noise pollution	Dust and litter control		
Hazardous substances	Trees and vegetation		
Site restored to original condition	Yes		No

Signature

Sign offName
PositionName
Position

Appendix 8: Construction Site Checklist for EMP Monitoring

Yes (✓) No (x)

Monitoring Details: _____

EHS supervisor appointed by contractor and available on site
 Construction site management plan (spoils, safety, material, schedule, equipment etc.,) prepared
 Traffic management plan prepared
 Dust is under control
 Excavated soil properly placed within minimum space
 Construction area is confined; no traffic/pedestrian entry observed
 Surplus soil/debris/waste is disposed without delay
 Construction material (sand/gravel/aggregate) brought to site as & when required only
 Tarpaulins used to cover sand & other loose material when transported by vehicles
 After unloading, wheels & undercarriage of vehicles cleaned prior to leaving the site
 No AC pipes disturbed/removed during excavation
 No chance finds encountered during excavation
 Work is planned in consultation with traffic police
 Work is not being conducted during heavy traffic
 Work at a stretch is completed within a day (excavation, pipe laying & backfilling)
 Pipe trenches are not kept open unduly
 Road is not completely closed; work is conducted on edge; at least one line is kept open
 Road is closed; alternative route provided & public is informed, information board provided
 Pedestrian access to houses is not blocked due to pipe laying
 Spaces left in between trenches for access
 Wooden planks/metal sheets provided across trench for pedestrian
 No public/unauthorized entry observed in work site
 Children safety measures (barricades, security) in place at work sites in residential areas
 Prior public information provided about the work, schedule and disturbances
 Caution/warning board provided on site
 Guards with red flag provided during work at busy roads
 Workers using appropriate PPE (boots, masks, gloves, helmets, ear muffs etc)
 Working conditions at CETP are assessed by EHS expert and ensure that there is no risk
 Workers conducting or near heavy noise work is provided with ear muffs
 Contractor is following standard & safe construction practices
 Deep excavation is conducted with land slip/protection measures
 First aid facilities are available on site and workers informed
 Drinking water provided at the site
 Toilet facility provided at the site
 Separate toilet facility is provided for women workers
 Workers camps are maintained cleanly
 Adequate toilet & bath facilities provided
 Contractor employed local workers as far as possible
 Workers camp set up with the

permission of PIU Adequate housing provided

Sufficient water provided for

drinking/washing/bathNo noisy work is
conducted in the nights

Local people informed of noisy work o blasting activity conducted

Pneumatic drills or other equipment creating vibration is not used near old/risky buildings

Appendix 9: Sample Grievance Registration Form

(To be available in Telegu and English)

The _____ Project welcomes complaints, suggestions, queries, and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback.

Should you choose to include your personal details but want that information to remain confidential, please inform us by writing/typing *(CONFIDENTIAL)* above your name. Thank you.

Date	Place of registration	Project Town			
		Project:			
Contact information/personal details					
Name		Gender	* * Male Female	Age	
Home address					
Place					
Phone no.					
E-mail					
Complaint/suggestion/comment/question Please provide the details (who, what, where, and how) of your grievance below: 					
If included as attachment/note/letter, please tick here:					
How do you want us to reach you for feedback or update on your comment/grievance? 					

FOR OFFICIAL USE ONLY

Registered by: (Name of official registering grievance)
Mode of communication: Note/letter E-mail Verbal/telephonic
Reviewed by: (Names/positions of officials reviewing grievance)

Action taken:	
Whether action taken disclosed:	Yes No
Means of disclosure:	

Appendix 10: Sample IBAT report for subproject area

Proximity Report generated by the Integrated Biodiversity Assessment Tool (IBAT)
(The IBAT report used is representative of the biodiversity elements existing in the broader area)



Proximity report generated by the
Integrated Biodiversity Assessment Tool

Site name	Anakapalle-Atchutapuram Road
Latitude/Longitude	17o 36' 13" North, 83o 0' 5" East
Date generated	27th June 2018
Generated by	asiandb
Company	ADB

About this report

This report presents the results of a proximity analysis to identify the biodiversity features and species which are located within 1 km, 2 km and 5 km.

Data used to generate this report

IUCN and UNEP-WCMC, 2017. The World Database on Protected Areas (WDPA) [On-line], March 2018.

BirdLife International (on behalf of the KBA Partnership), 2016. Key Biodiversity Areas: December 2016 version.

IUCN, 2017. The IUCN Red List of Threatened Species grid analysis of range maps. Version 2017-3 (December).

Limitations

This report provides an indication of the potential biodiversity-related features - protected areas, key biodiversity areas and species - close to the specified location. It provides an early indication of potential biodiversity concerns and can provide valuable guidance in making decisions. For example, this information can be helpful when assessing the potential environmental risk and impact of a site, categorising investments/projects, preparing the terms of reference for an impact assessment, focusing attention on key species of conservation concern and sites of known conservation value, and reviewing the results of an impact assessment.

The report does not provide details of potential indirect, downstream or cumulative impacts. Furthermore, the report should be regarded as a “first-step”, providing a set of conservation values sourced from global data sets, and is not a substitute for further investigation and due diligence, especially concerning national and/or local conservation priorities.

For ultimate accuracy, distance calculations are performed by reprojecting the spatial data (as shown through the map viewer) to an equal distance projection, and so may not match precisely the results shown on the map.

Protected Areas and Key Biodiversity Areas

The following sites are found within the selected buffer distances:

Features within 1 km

There are no features within 1 km.

Features within 2 km

There are no features within 2 km.

Features within 5 km

There are no features within 5 km.

IUCN RED LIST OF THREATENED SPECIES

Given suitable habitat, the following species are potentially found close to the area of interest:

Taxonomic group	Scientific Name	Common Name	IUCN Red List category
Amphibians	<i>Duttaphrynus melanostictus</i>	Black-spectacled Toad	LC
Amphibians	<i>Duttaphrynus stomaticus</i>		LC
Amphibians	<i>Euphlyctis cyanophlyctis</i>		LC
Amphibians	<i>Euphlyctis hexadactylus</i>	Indian Green Frog	LC
Amphibians	<i>Fejervarya limnocharis</i>	Asian Grass Frog	LC
Amphibians	<i>Hoplobatrachus crassus</i>	Jerdon's Bullfrog	LC
Amphibians	<i>Hoplobatrachus tigerinus</i>	Indian Bullfrog	LC
Amphibians	<i>Hydrophylax malabaricus</i>		LC
Amphibians	<i>Microhyla ornata</i>	Ant Frog	LC
Amphibians	<i>Polypedates maculatus</i>	Himalayan Tree Frog	LC
Amphibians	<i>Sphaerotheca breviceps</i>		LC
Amphibians	<i>Sphaerotheca dobsonii</i>		LC
Amphibians	<i>Sphaerotheca carolandae</i>		LC
Amphibians	<i>Uperodon globulosus</i>		LC
Amphibians	<i>Uperodon systoma</i>	Marbled Balloon Frog	LC
Amphibians	<i>Uperodon taprobanicus</i>	Sri Lankan Bullfrog	LC
Birds	<i>Accipiter badius</i>	Shikra	LC
Birds	<i>Acridotheres fuscus</i>	Jungle Myna	LC
Birds	<i>Acridotheres tristis</i>	Common Myna	LC
Birds	<i>Acrocephalus dumetorum</i>	Blyth's Reed-warbler	LC
Birds	<i>Acrocephalus tentoreus</i>	Clamorous Reed-warbler	LC
Birds	<i>Actitis hypoleucos</i>	Common Sandpiper	LC
Birds	<i>Aegithina tiphia</i>	Common Iora	LC
Birds	<i>Aethopygia siparaja</i>	Crimson Sunbird	LC
Birds	<i>Alauda gulgula</i>	Oriental Skylark	LC
Birds	<i>Alcedo atthis</i>	Common Kingfisher	LC
Birds	<i>Alcedo meninting</i>	Blue-eared Kingfisher	LC

Taxonomic group	Scientific Name	Common Name	IUCN Red List category
Birds	Alcippepoioicephala	Brown-cheeked Fulvetta	LC
Birds	Amandavaamandava	Red Avadavat	LC
Birds	Amaurornisphoenicurus	White-breasted Waterhen	LC
Birds	Anas crecca	Common Teal	LC
Birds	Anas poecilorhyncha	Indian Spot-billed Duck	LC
Birds	Anastomusoscitans	Asian Openbill	LC
Birds	Anhinga melanogaster	Oriental Darter	NT
Birds	Anthracocerosalbirostris	Oriental Pied Hornbill	LC
Birds	Anthusgodlewskii	Blyth's Pipit	LC
Birds	Anthusrichardi	Richard's Pipit	LC

Birds	Anthusrufulus	Paddyfield Pipit	LC
Birds	Aquila rapax	Tawny Eagle	LC
Birds	Ardea alba	Great White Egret	LC
Birds	Ardea cinerea	Grey Heron	LC
Birds	Ardea intermedia	Intermediate Egret	LC
Birds	Ardea purpurea	Purple Heron	LC
Birds	Ardeolagrayii	Indian Pond-heron	LC
Birds	Artamusfuscus	Ashy Woodswallow	LC
Birds	Arundinaxaedon	Thick-billed Warbler	LC
Birds	Asioflammeus	Short-eared Owl	LC
Birds	Athene brama	Spotted Owlet	LC
Birds	Aythya ferina	Common Pochard	VU
Birds	Aythya fuligula	Tufted Duck	LC
Birds	Aythya nyroca	Ferruginous Duck	NT
Birds	Bubo bengalensis	Rock Eagle-owl	LC
Birds	Bubo coromandus	Dusky Eagle-owl	LC
Birds	Bubulcus ibis	Cattle Egret	LC
Birds	Burhinus indicus	Indian Thick-knee	LC
Birds	Butasturteesa	White-eyed Buzzard	LC

Birds	<i>Butorides striata</i>	Green-backed Heron	LC
Birds	<i>Cacomantismerulinus</i>	Plaintive Cuckoo	LC
Birds	<i>Cacomantispasserinus</i>	Grey-bellied Cuckoo	LC
Birds	<i>Calandrelladukhunensis</i>	Eastern Short-toed Lark	LC
Birds	<i>Calidris alba</i>	Sanderling	LC
Birds	<i>Calidris minuta</i>	Little Stint	LC
Birds	<i>Calidris pugnax</i>	Ruff	LC
Birds	<i>Calidris ruficollis</i>	Red-necked Stint	NT
Birds	<i>Calidris temminckii</i>	Temminck's Stint	LC
Birds	<i>Calliope calliope</i>	Siberian Rubythroat	LC
Birds	<i>Caprimulgus affinis</i>	Savanna Nightjar	LC
Birds	<i>Caprimulgus asiaticus</i>	Indian Nightjar	LC
Birds	<i>Caprimulgus atripennis</i>	Jerdon's Nightjar	LC
Birds	<i>Caprimulgus indicus</i>	Jungle Nightjar	LC
Birds	<i>Carpodacus erythrinus</i>	Common Rosefinch	LC
Birds	<i>Cecropisdaurica</i>	Red-rumped Swallow	LC
Birds	<i>Centropus sinensis</i>	Greater Coucal	LC
Birds	<i>Cerylerudis</i>	Pied Kingfisher	LC
Birds	<i>Chaetornis striata</i>	Bristled Grassbird	VU
Birds	<i>Chalcophaps indica</i>	Grey-capped Emerald Dove	LC
Birds	<i>Charadrius dubius</i>	Little Ringed Plover	LC
Birds	<i>Charadrius hiaticula</i>	Common Ringed Plover	LC
Birds	<i>Charadrius mongolus</i>	Lesser Sandplover	LC
Birds	<i>Chlidoniashybrida</i>	Whiskered Tern	LC
Birds	<i>Chloropsisjerdoni</i>	Jerdon's Leafbird	LC
Birds	<i>Chrysocolaptesfestivus</i>	White-naped Woodpecker	LC
Birds	<i>Ciconia ciconia</i>	White Stork	LC
Birds	<i>Cinnyris asiaticus</i>	Purple Sunbird	LC
Birds	<i>Circus aeruginosus</i>	Western Marsh-harrier	LC

Birds	<i>Circus macrourus</i>	Pallid Harrier	NT
Birds	<i>Cisticola juncidis</i>	Zitting Cisticola	LC
Birds	<i>Clamatorcoromandus</i>	Chestnut-winged Cuckoo	LC
Birds	<i>Clamatorjacobinus</i>	Jacobin Cuckoo	LC
Birds	<i>Columba livia</i>	Rock Dove	LC
Birds	<i>Copsychus saularis</i>	Oriental Magpie-robin	LC
Birds	<i>Coracias benghalensis</i>	Indian Roller	LC
Birds	<i>Coracinamacei</i>	Indian Cuckooshrike	LC
Birds	<i>Corvus macrorhynchos</i>	Large-billed Crow	LC
Birds	<i>Corvus splendens</i>	House Crow	LC
Birds	<i>Coturnix coromandelica</i>	Rain Quail	LC
Birds	<i>Coturnix coturnix</i>	Common Quail	LC
Birds	<i>Cuculus micropterus</i>	Indian Cuckoo	LC
Birds	<i>Cuculus poliocephalus</i>	Lesser Cuckoo	LC
Birds	<i>Cyanecula svecica</i>	Bluethroat	LC
Birds	<i>Cyornis rubeculoides</i>	Blue-throated Blue-flycatcher	LC
Birds	<i>Cyornis tickelliae</i>	Tickell's Blue-flycatcher	LC
Birds	<i>Cypsiurus balasiensis</i>	Asian Palm-swift	LC
Birds	<i>Dendrocitta vagabunda</i>	Rufous Treepie	LC
Birds	<i>Dendrocygna bicolor</i>	Fulvous Whistling-duck	LC
Birds	<i>Dendrocygna javanica</i>	Lesser Whistling-duck	LC
Birds	<i>Dicaeum agile</i>	Thick-billed Flowerpecker	LC
Birds	<i>Dicaeum erythrorhynchos</i>	Pale-billed Flowerpecker	LC
Birds	<i>Dicrurus caeruleus</i>	White-bellied Drongo	LC
Birds	<i>Dicrurus leucophaeus</i>	Ashy Drongo	LC
Birds	<i>Dicrurus macrocercus</i>	Black Drongo	LC
Birds	<i>Dicrurus paradiseus</i>	Greater Racquet-tailed Drongo	LC
Birds	<i>Dumetia hyperythra</i>	Tawny-bellied Babbler	LC
Birds	<i>Egretta garzetta</i>	Little Egret	LC

Birds	<i>Egretta garzetta</i>	Western Reef-egret	LC
Birds	<i>Elanus caeruleus</i>	Black-winged Kite	LC
Birds	<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	NT
Birds	<i>Eremophila alpestris</i>	Ashy-crowned Sparrow-lark	LC
Birds	<i>Eudynamis scolopacea</i>	Western Koel	LC
Birds	<i>Eumyias thalassina</i>	Verditer Flycatcher	LC
Birds	<i>Falco amurensis</i>	Amur Falcon	LC
Birds	<i>Falco peregrinus</i>	Peregrine Falcon	LC
Birds	<i>Falco tinnunculus</i>	Common Kestrel	LC
Birds	<i>Francolinus pondicerianus</i>	Grey Francolin	LC
Birds	<i>Fregetta tropica</i>	Black-bellied Storm-petrel	LC
Birds	<i>Fulica atra</i>	Common Coot	LC
Birds	<i>Gallicrex cinerea</i>	Watercock	LC
Birds	<i>Gallinago stenura</i>	Pintail Snipe	LC
Birds	<i>Gallinula chloropus</i>	Common Moorhen	LC
Birds	<i>Gallus gallus</i>	Red Junglefowl	LC
Birds	<i>Geokichla citreolinea</i>	Orange-headed Thrush	LC
Birds	<i>Glareola lactea</i>	Little Pratincole	LC
Birds	<i>Glaucidium radiatum</i>	Jungle Owlet	LC
Birds	<i>Gracula indica</i>	Southern Hill Myna	LC
Birds	<i>Gracula religiosa</i>	Common Hill Myna	LC
Birds	<i>Gracula robusta</i>	Nias Hill Myna	CR
Birds	<i>Gracula venerata</i>	Tenggara Hill Myna	EN
Birds	<i>Gracupica contra</i>	Asian Pied Starling	LC
Birds	<i>Gymnoris xanthocollis</i>	Chestnut-shouldered Bush-sparrow	LC
Birds	<i>Gyps bengalensis</i>	White-rumped Vulture	CR
Birds	<i>Gyps indicus</i>	Indian Vulture	CR
Birds	<i>Halcyon pileata</i>	Black-capped Kingfisher	LC

Birds	<i>Halcyon smyrnensis</i>	White-breasted Kingfisher	LC
Birds	<i>Haliaeetus leucogaster</i>	White-bellied Sea-eagle	LC
Birds	<i>Haliasturindus</i>	Brahminy Kite	LC
Birds	<i>Harpactes fasciatus</i>	Malabar Trogon	LC
Birds	<i>Hierococcyxvarius</i>	Common Hawk-cuckoo	LC
Birds	<i>Himantopus himantopus</i>	Black-winged Stilt	LC
Birds	<i>Hirundorustica</i>	Barn Swallow	LC
Birds	<i>Hirundosmithii</i>	Wire-tailed Swallow	LC
Birds	<i>Hydrobatesmonorhis</i>	Swinhoe's Storm-petrel	NT
Birds	<i>Hydrophasianuschirurgus</i>	Pheasant-tailed Jacana	LC
Birds	<i>Hydroprogne caspia</i>	Caspian Tern	LC
Birds	<i>Hypothymis azurea</i>	Black-naped Monarch	LC
Birds	<i>Iduna caligata</i>	Booted Warbler	LC
Birds	<i>Ixobrychus cinnamomeus</i>	Cinnamon Bittern	LC
Birds	<i>Jynx torquilla</i>	Eurasian Wryneck	LC

Birds	<i>Ketupazeylonensis</i>	Brown Fish-owl	LC
Birds	<i>Kittacinclamalabarica</i>	White-rumped Shama	LC
Birds	<i>Lalage melanoptera</i>	Black-headed Cuckoo-shrike	LC
Birds	<i>Lanius cristatus</i>	Brown Shrike	LC
Birds	<i>Lanius schach</i>	Long-tailed Shrike	LC
Birds	<i>Lanius vittatus</i>	Bay-backed Shrike	LC
Birds	<i>Larus brunnicephalus</i>	Brown-headed Gull	LC
Birds	<i>Larus ichthyaetus</i>	Pallas's Gull	LC
Birds	<i>Larvivora brunnea</i>	Indian Blue Robin	LC
Birds	<i>Leptocomazeylonica</i>	Purple-rumped Sunbird	LC
Birds	<i>Limosa limosa</i>	Black-tailed Godwit	NT
Birds	<i>Lonchura striata</i>	White-rumped Munia	LC
Birds	<i>Loriculus vernalis</i>	Vernal Hanging-parrot	LC
Birds	<i>Malacocincla abbotti</i>	Abbott's Babbler	LC

Birds	<i>Meropsorientalis</i>	Asian Green Bee-eater	LC
Birds	<i>Meropsphilippinus</i>	Blue-tailed Bee-eater	LC
Birds	<i>Microcarboniger</i>	Little Cormorant	LC
Birds	<i>Micropternusbrachyurus</i>	Rufous Woodpecker	LC
Birds	<i>Milvus migrans</i>	Black Kite	LC
Birds	<i>Mirafraffinis</i>	Jerdon's Bushlark	LC
Birds	<i>Monticolacinclorhyncha</i>	Blue-capped Rock-thrush	LC
Birds	<i>Monticola solitarius</i>	Blue Rock-thrush	LC
Birds	<i>Motacilla alba</i>	White Wagtail	LC
Birds	<i>Motacilla cinerea</i>	Grey Wagtail	LC
Birds	<i>Motacillacitreola</i>	Citrine Wagtail	LC
Birds	<i>Motacilla flava</i>	Western Yellow Wagtail	LC
Birds	<i>Motacillamaderaspatensis</i>	White-browed Wagtail	LC
Birds	<i>Muscicapadaurica</i>	Asian Brown Flycatcher	LC
Birds	<i>Mycteria leucocephala</i>	Painted Stork	NT
Birds	<i>Neophron percnopterus</i>	Egyptian Vulture	EN
Birds	<i>Numenius arquata</i>	Eurasian Curlew	NT
Birds	<i>Numenius phaeopus</i>	Whimbrel	LC
Birds	<i>Nycticoraxnycticorax</i>	Black-crowned Night-heron	LC
Birds	<i>Oceanites oceanicus</i>	Wilson's Storm-petrel	LC
Birds	<i>Orioluskundoo</i>	Indian Golden Oriole	LC
Birds	<i>Orioluxanthornus</i>	Black-hooded Oriole	LC
Birds	<i>Orthotomussutorius</i>	Common Tailorbird	LC
Birds	<i>Otusbakkamoena</i>	Indian Scops-owl	LC
Birds	<i>Pandion haliaetus</i>	Osprey	LC
Birds	<i>Parus major</i>	Great Tit	LC
Birds	<i>Passer domesticus</i>	House Sparrow	LC
Birds	<i>Pastor roseus</i>	Rosy Starling	LC
Birds	<i>Pavocristatus</i>	Indian Peafowl	LC
Birds	<i>Pelargopsis capensis</i>	Stork-billed Kingfisher	LC

Birds	<i>Pelecanus philippensis</i>	Spot-billed Pelican	NT
Birds	<i>Perdica asiatica</i>	Jungle Bush-quail	LC
Birds	<i>Pericrocotus cinnamomeus</i>	Small Minivet	LC
Birds	<i>Pericrocotus flammeus</i>	Scarlet Minivet	LC
Birds	<i>Pernis ptilorhynchus</i>	Oriental Honey-buzzard	LC
Birds	<i>Phaenicophaeus tristis</i>	Green-billed Malkoha	LC
Birds	<i>Phaenicophaeus viridirostris</i>	Blue-faced Malkoha	LC
Birds	<i>Phaethon rubricauda</i>	Red-tailed Tropicbird	LC
Birds	<i>Phalacrocorax carbo</i>	Great Cormorant	LC
Birds	<i>Phoenicopterus roseus</i>	Greater Flamingo	LC
Birds	<i>Phoenicurus ochruros</i>	Black Redstart	LC
Birds	<i>Phylloscopus affinis</i>	Tickell's Leaf-warbler	LC
Birds	<i>Phylloscopus griseolus</i>	Sulphur-bellied Warbler	LC
Birds	<i>Phylloscopus humei</i>	Hume's Leaf-warbler	LC
Birds	<i>Picoides nanus</i>	Indian Pygmy Woodpecker	LC
Birds	<i>Pitta brachyura</i>	Indian Pitta	LC
Birds	<i>Platalea leucorodia</i>	Eurasian Spoonbill	LC
Birds	<i>Ploceus philippinus</i>	Baya Weaver	LC
Birds	<i>Pluvialis squatarola</i>	Grey Plover	LC
Birds	<i>Podiceps cristatus</i>	Great Crested Grebe	LC
Birds	<i>Porphyrio porphyrio</i>	Purple Swamphe	LC
Birds	<i>Prinia hodgsonii</i>	Grey-breasted Prinia	LC
Birds	<i>Prinia inornata</i>	Plain Prinia	LC
Birds	<i>Prinia socialis</i>	Ashy Prinia	LC
Birds	<i>Prinia sylvatica</i>	Jungle Prinia	LC
Birds	<i>Psilopogon haemacephalus</i>	Coppersmith Barbet	LC
Birds	<i>Psittacula cyanocephala</i>	Plum-headed Parakeet	LC
Birds	<i>Psittacula eupatria</i>	Alexandrine Parakeet	NT
Birds	<i>Psittacula krameri</i>	Rose-ringed Parakeet	LC
Birds	<i>Ptyonoprogne concolor</i>	Dusky Crag Martin	LC

Birds	<i>Pycnonotus cafer</i>	Red-vented Bulbul	LC
Birds	<i>Pycnonotus flaviventris</i>	Black-crested Bulbul	LC
Birds	<i>Pycnonotus jocosus</i>	Red-whiskered Bulbul	LC
Birds	<i>Pycnonotus luteolus</i>	White-browed Bulbul	LC
Birds	<i>Recurvirostra avosetta</i>	Pied Avocet	LC
Birds	<i>Rhipidura aureola</i>	White-browed Fantail	LC
Birds	<i>Saxicola caprata</i>	Pied Bushchat	LC
Birds	<i>Saxicola leucophaea</i>	Indian Robin	LC
Birds	<i>Sitta frontalis</i>	Velvet-fronted Nuthatch	LC
Birds	<i>Spatula clypeata</i>	Northern Shoveler	LC
Birds	<i>Spatula querquedula</i>	Garganey	LC
Birds	<i>Spilopelia senegalensis</i>	Laughing Dove	LC
Birds	<i>Spilopelia squamipennis</i>	Western Spotted Dove	LC
Birds	<i>Sterna acuticauda</i>	Black-bellied Tern	EN
Birds	<i>Streptopelia decaocto</i>	Eurasian Collared-dove	LC
Birds	<i>Strix leptogrammica</i>	Brown Wood-owl	LC
Birds	<i>Strix ocellata</i>	Mottled Wood-owl	LC
Birds	<i>Sturnia malabarica</i>	Chestnut-tailed Starling	LC
Birds	<i>Sturnia pagodarum</i>	Brahminy Starling	LC
Birds	<i>Sylvia curruca</i>	Lesser Whitethroat	LC
Birds	<i>Syrrhaptes indicus</i>	Lesser Florican	EN
Birds	<i>Taccocua leschenaultii</i>	Sirkeer Malkoha	LC
Birds	<i>Tachybaptus ruficollis</i>	Little Grebe	LC
Birds	<i>Tadorna ferruginea</i>	Ruddy Shelduck	LC
Birds	<i>Tephrodornis pondicerianus</i>	Common Woodshrike	LC
Birds	<i>Tephrodornis virgatus</i>	Large Woodshrike	LC
Birds	<i>Terpsiphone paradisi</i>	Indian Paradise-flycatcher	LC
Birds	<i>Thalasseus bengalensis</i>	Lesser Crested Tern	LC
Birds	<i>Treron bicinctus</i>	Orange-breasted Green-pigeon	LC

Birds	Treronphoenicopterus	Yellow-footed Green-pigeon	LC
Birds	Tringaerythropus	Spotted Redshank	LC
Birds	Tringaglareola	Wood Sandpiper	LC
Birds	Tringanebularia	Common Greenshank	LC
Birds	Tringaochropus	Green Sandpiper	LC
Birds	Tringatotanus	Common Redshank	LC
Birds	Turdoides striata	Jungle Babbler	LC
Birds	Turdus unicolor	Tickell's Thrush	LC
Birds	Turnixsuscitator	Barred Buttonquail	LC
Birds	Turnixsylvaticus	Common Buttonquail	LC
Birds	Turnixtanki	Yellow-legged Buttonquail	LC
Birds	Tyto alba	Common Barn-owl	LC
Birds	Upupa epops	Common Hoopoe	LC
Birds	Vanellus indicus	Red-wattled Lapwing	LC
Birds	Vanellusmalabaricus	Yellow-wattled Lapwing	LC
Birds	Zaporniaakool	Brown Crake	LC
Birds	Zosteropsalpebrosus	Oriental White-eye	LC

Fishes	Ablenneshians	Flat Needlefish	LC
Fishes	Acanthopagrusberda	Picnic Seabream	LC
Fishes	Acanthopagruslongispinnis	Bengal Yellowfin Seabream	DD
Fishes	Acanthuruslineatus	Lined Surgeonfish	LC
Fishes	Acanthurusmata	Elongate Surgeonfish	LC
Fishes	Acanthurustriostegus	Convict Surgeonfish	LC
Fishes	Acentronuratentaculata	Shortpouch Pygmy Pipehorse	LC
Fishes	Aesopiacornuta	Unicorn Sole	LC
Fishes	Aetobatus flagellum	Longhead Eagle Ray	EN
Fishes	Aetobatusnarinari	Spotted Eagle Ray	NT
Fishes	Aetobatus ocellatus	Spotted Eagle Ray	VU

Fishes	<i>Aetomylaeus maculatus</i>	Mottled Eagle Ray	EN
Fishes	<i>Aetomylaeus nichofii</i>	Banded Eagle Ray	VU
Fishes	<i>Albula oligolepis</i>	Smallscale Bonefish	DD
Fishes	<i>Alectisciliaris</i>	African Pompano	LC
Fishes	<i>Alepes vari</i>	Herring Scad	LC
Fishes	<i>Alepisaurus ferox</i>	Long Snouted Lancetfish	LC
Fishes	<i>Alopias pelagicus</i>	Pelagic Thresher	VU
Fishes	<i>Alopias superciliosus</i>	Bigeye Thresher Shark	VU
Fishes	<i>Alopias vulpinus</i>	Common Thresher Shark	VU
Fishes	<i>Ambassisurotaenia</i>	Bleeker's Glass Perchlet	LC
Fishes	<i>Amblyeleotris wheeleri</i>	Gorgeous Prawn-goby	LC
Fishes	<i>Amblypharyngodon microlepis</i>	Indian Carplet	LC
Fishes	<i>Anacanthus barbatus</i>	Bearded Leatherjacket	LC
Fishes	<i>Anguilla bengalensis</i>	Indian Mottled Eel	NT
Fishes	<i>Anguilla bicolor</i>	Shortfin Eel	NT
Fishes	<i>Anguilla marmorata</i>	Marbled Eel	LC
Fishes	<i>Anoplogaster cornuta</i>	Common Fangtooth	LC
Fishes	<i>Anoxypristiscuspidata</i>	Narrow Sawfish	EN
Fishes	<i>Antennatus nummifer</i>	Big-spot Angler	LC
Fishes	<i>Aphareus furca</i>	Small-toothed Jobfish	LC
Fishes	<i>Aphareus rutilans</i>	Rusty Jobfish	LC
Fishes	<i>Aplocheilichthys lineatus</i>	Striped panchax	LC
Fishes	<i>Aprion virescens</i>	Green Jobfish	LC
Fishes	<i>Argyropelecus hemigymnus</i>	Half-naked Hatchetfish	LC
Fishes	<i>Argyrops spinifer</i>	King Soldier Bream	LC
Fishes	<i>Aristostomias lunifer</i>		LC
Fishes	<i>Arius arius</i>	Threadfin Sea Catfish	LC
Fishes	<i>Arnoglossus macrolophus</i>	Large-crested Lefteye Flounder	LC
Fishes	<i>Arothron leopardus</i>	Banded Leopardblowfish	DD

Fishes	<i>Atelomycterus marmoratus</i>	Coral Catshark	NT
Fishes	<i>Aurigequula fasciata</i>	Threadfin Ponyfish	LC
Fishes	<i>Auxis rochei</i>	Bullet Tuna	LC
Fishes	<i>Auxis thazard</i>	Frigate Tuna	LC
Fishes	<i>Avocettina infans</i>	Avocet Snipe Eel	LC
Fishes	<i>Awaous grammepomus</i>	Scribbled Goby	LC
Fishes	<i>Awaous melanocephalus</i>	Largesnout Goby	DD
Fishes	<i>Bagarius yarrelli</i>		NT
Fishes	<i>Bahabachaptis</i>	Chaptis Bahaba	DD
Fishes	<i>Balistes rotundatus</i>		LC
Fishes	<i>Bangana ariza</i>	Ariza Labeo	LC
Fishes	<i>Bathyrhynchoceros vicinus</i>	Large-toothed Conger	LC
Fishes	<i>Benthalbella infans</i>	Zugmayer's Pearleye	LC
Fishes	<i>Benthosemapterotum</i>	Skinnycheek Lanternfish	LC
Fishes	<i>Beryx splendens</i>	Splendid Alfonsino	LC
Fishes	<i>Bostrychus sinensis</i>	Four-eyed Sleeper	LC
Fishes	<i>Bothus pantherinus</i>	Leopard Flounder	LC
Fishes	<i>Brachirus pan</i>	Pan Sole	LC
Fishes	<i>Brachypleuranovaezeelandiae</i>	Yellow-dappled Flounder	LC
Fishes	<i>Bregmaceros nectabanus</i>		LC
Fishes	<i>Brevitrygon imbricata</i>	Scaly Whipray	DD
Fishes	<i>Callionymus sagitta</i>	Arrow-headed Dart Dragonet	LC
Fishes	<i>Canthigaster petersii</i>		LC
Fishes	<i>Caranx sexfasciatus</i>	Bigeye Trevally	LC
Fishes	<i>Carcharhinus albimarginatus</i>	Silvertip Shark	VU
Fishes	<i>Carcharhinus amblyrhynchoides</i>	Graceful Shark	NT
Fishes	<i>Carcharhinus amboinensis</i>	Pigeye Shark	DD
Fishes	<i>Carcharhinus brevipinna</i>	Spinner Shark	NT
Fishes	<i>Carcharhinus dussumieri</i>	Widemouth Blackspot Shark	NT

Fishes	<i>Carcharhinus falciformis</i>	Silky Shark	VU
Fishes	<i>Carcharhinus hemiodon</i>	Pondicherry Shark	CR
Fishes	<i>Carcharhinus limbatus</i>	Blacktip Shark	NT
Fishes	<i>Carcharhinus longimanus</i>	Oceanic Whitetip Shark	VU
Fishes	<i>Carcharhinus macroti</i>	Hardnose Shark	NT
Fishes	<i>Carcharhinus melanopterus</i>	Blacktip Reef Shark	NT
Fishes	<i>Carcharhinus sealei</i>	Blackspot Shark	NT
Fishes	<i>Carcharhinus sorrah</i>	Spottail Shark	NT
Fishes	<i>Carcharodon carcharias</i>	Great White Shark	VU
Fishes	<i>Caulophryne jordani</i>	Fanfin Angler	LC
Fishes	<i>Centriscus scutatus</i>	Grooved Razorfish	LC

Fishes	<i>Centropyge fisheri</i>	Hawaiian Flame Angelfish	LC
Fishes	<i>Cephalopholis formosa</i>	Bluelined Hind	LC
Fishes	<i>Cephalopholis sonnerati</i>	Tomato Hind	LC
Fishes	<i>Ceratiasholboelli</i>	Deepsea Angler	LC
Fishes	<i>Chaenogaleus macrostoma</i>	Hooktooth Shark	VU
Fishes	<i>Chaenophryne draco</i>		LC
Fishes	<i>Chaenophryne ramifera</i>		LC
Fishes	<i>Chaetodon andamanensis</i>	Yellow Butterflyfish	DD
Fishes	<i>Chaetodon auriga</i>	Threadfin Butterflyfish	LC
Fishes	<i>Chaetodon collare</i>	Red-tailed Butterflyfish	LC
Fishes	<i>Chaetodon decussatus</i>	Indian vagabond Butterflyfish	LC
Fishes	<i>Chaetodon lunula</i>	Redstriped Butterflyfish	LC
Fishes	<i>Chaetodon octofasciatus</i>	Eight-striped Butterflyfish	LC
Fishes	<i>Chaetodon rafflesii</i>	Raffle's Butterflyfish	LC
Fishes	<i>Chaetodon semeion</i>	Decorated Butterflyfish	LC
Fishes	<i>Chaetodon triangulum</i>	Herringbone Butterflyfish	LC
Fishes	<i>Chaetodon trifasciatus</i>	Pinstriped Butterflyfish	LC
Fishes	<i>Chaetodon vagabundus</i>	Criss-cross Butterflyfish	LC

Fishes	Channagachua	Dwarf Snakehead	LC
Fishes	Channamarulius		LC
Fishes	Chascanopsettalugubris	Pelican flounder	LC
Fishes	Chauliodussloani	Sloane's Viperfish	LC
Fishes	Chelonmacrolepis	Largescale Mullet	LC
Fishes	Chelonmelinopterus	Otomebora Mullet	LC
Fishes	Chelonodonpatoca	Milkspotted Puffer	LC
Fishes	Chiloscyllium griseum	Grey Bamboo Shark	NT
Fishes	Chiloscyllium indicum	Ridgebacked Bamboo Shark	NT
Fishes	Chiloscylliumplagiosum	Whitespotted Bamboo Shark	NT
Fishes	Chiloscyllium punctatum	Grey Carpetshark	NT
Fishes	Chlorophthalmusagassizi	Agassiz's Thread-sail Fish	LC
Fishes	Chrysipteraunimaculata	One-spot Demoiselle	LC
Fishes	Cirrhinusmrigala	Mrigal	LC
Fishes	Cirrhinusreba	Reba Carp	LC
Fishes	Cocotropus roseus	Velvetfish	LC
Fishes	Coilianeglecta	Neglected Grenadier Anchovy	LC
Fishes	Cookeolus japonicus	Longfinned Bullseye	LC
Fishes	Coryphaenaequiselis	Pompano Dolphinfin	LC
Fishes	Coryphaenahippurus	Common Dolphinfin	LC
Fishes	Cosmocampusinvestigatoris	Investigator Pipefish	LC
Fishes	Cryptopsarascouesii	TriplewartSeadevil	LC

Fishes	Cubicepspauciradiatus	Bigeye Cigarfish	LC
Fishes	Cyclothoneacclinidens	Bent-tooth Bristlemouth	LC
Fishes	Cyclothonebraueri	Brauer's Eye-nosed Fish	LC
Fishes	Cyclothonemicrodon	Small-toothed Portholefish	LC
Fishes	Cyclothone pallida	Bicolored Bristlemouth	LC
Fishes	Cyclothonepseudopallida	Slender Bristlemouth	LC

Fishes	<i>Desmodemapolystictum</i>	Polka-dot Ribbonfish	LC
Fishes	<i>Diaphussplendidus</i>		LC
Fishes	<i>Diplophos taenia</i>	Pacific Portholefish	LC
Fishes	<i>Diretmus argenteus</i>	Silver Spinyfin	LC
Fishes	<i>Ditropichthysstoreri</i>	Doublekeeledwhalefish	DD
Fishes	<i>Doryrhamphusexcisus</i>	Bluestripe Pipefish	LC
Fishes	<i>Dysalotusalcocki</i>		LC
Fishes	<i>Echiostomabarbatum</i>	Threadfin Dragonfish	LC
Fishes	<i>Eleotrisfusca</i>	Brown SpinecheekGudgeon	LC
Fishes	<i>Engyprosopongrandisquama</i>	Largescale Flounder	LC
Fishes	<i>Entomacrodusepalzeocheilos</i>	FringelipRockskipper	LC
Fishes	<i>Entomacrodusstriatus</i>	Blackspotted Rockskipper	LC
Fishes	<i>Epinephelusbleekeri</i>	Duskytail Grouper	NT
Fishes	<i>Epinepheluscoioides</i>	Orange-spotted Grouper	NT
Fishes	<i>Epinepheluserythrus</i>	Cloudy Grouper	DD
Fishes	<i>Epinepheluslanceolatus</i>	Giant Grouper	VU
Fishes	<i>Esomusdanrica</i>	Flying barb	LC
Fishes	<i>Eteliscoruscans</i>	Deepwater Longtail Red Snapper	LC
Fishes	<i>Eubleekeria splendens</i>	Splendid Ponyfish	LC
Fishes	<i>Euprotomicrusbispinatus</i>	Pygmy Shark	LC
Fishes	<i>Eusphyrablochii</i>	Winghead Shark	EN
Fishes	<i>Euthynnusaffinis</i>	Kawakawa	LC
Fishes	<i>Exocoetus volitans</i>	Tropical Two-wing Flyingfish	LC
Fishes	<i>Exyriaspuntang</i>	Puntang Goby	LC
Fishes	<i>Forcipigerflavissimus</i>	Big long-nosed Butterflyfish	LC
Fishes	<i>Galeocerdo cuvier</i>	Tiger Shark	NT
Fishes	<i>Gazza minuta</i>	Toothed Ponyfish	LC
Fishes	<i>Gephyroberyxdarwinii</i>	Big Roughy	LC
Fishes	<i>Gigantactisvanhoeffeni</i>		DD

Fishes	<i>Glaucostegusgranulatus</i>	Sharpnose Guitarfish	VU
Fishes	<i>Glaucostegusobtus</i>	Widenose Guitarfish	VU
Fishes	<i>Glaucostegus typus</i>	Giant Shovelnose Ray	VU
Fishes	<i>Glossogobiusgiuris</i>	Bareye Goby	LC
Fishes	<i>Glyphis gangeticus</i>	Ganges Shark	CR

Fishes	<i>Grammatobothuspolyophthalmus</i>	Threespot Flounder	LC
Fishes	<i>Gymnocaesiogymnoptera</i>	Slender Fusilier	LC
Fishes	<i>Gymnocranius griseus</i>	Grey Large-eye Bream	LC
Fishes	<i>Gymnurapoecilura</i>	Longtail Butterfly Ray	NT
Fishes	<i>Gymnuratentaculata</i>	Tentacled Butterfly Ray	DD
Fishes	<i>Gymnurazonura</i>	Zonetail Butterfly Ray	VU
Fishes	<i>Helcogrammaelliotti</i>	Red-eye Threefin	LC
Fishes	<i>Hemigymnus fasciatus</i>	Barred thicklip wrasse	LC
Fishes	<i>Hemigymnusmelapterus</i>	Blackedgethicklip wrasse	LC
Fishes	<i>Hemipristiselongata</i>	Snaggletooth Shark	VU
Fishes	<i>Heniochusacuminatus</i>	Pennant Coral Fish	LC
Fishes	<i>Heniochuspleurotaenia</i>	Indian Ocean Bannerfish	LC
Fishes	<i>Himantolophusgroenlandicus</i>	Atlantic Football-Fish	LC
Fishes	<i>Himantura marginata</i>	Blackedge Whipray	DD
Fishes	<i>Himantura uarnak</i>	Reticulate Whipray	VU
Fishes	<i>Hippichthysheptagonus</i>	Reticulated Freshwater Pipefish	LC
Fishes	<i>Hippocampus histrix</i>	Thorny Seahorse	VU
Fishes	<i>Hippocampus kelloggi</i>	Great Seahorse	VU
Fishes	<i>Hippocampus trimaculatus</i>	Three-spot Seahorse	VU
Fishes	<i>Idiacanthusfasciola</i>	Ribbon Sawtail Fish	LC
Fishes	<i>Inegocia japonica</i>	Japanese Flathead	LC
Fishes	<i>Iniistiusdea</i>	Black-spottuskfish	LC
Fishes	<i>Istiblenniusedentulus</i>	Smoothlipped Blenny	LC
Fishes	<i>Istigobiusornatus</i>	Ornate Goby	LC

Fishes	Istiompax indica	Black Marlin	DD
Fishes	Istiophorus platypterus	Sailfish	LC
Fishes	Isurus paucus	Shortfin Mako	VU
Fishes	Isurus paucus	Longfin Mako	VU
Fishes	Johnius coitor	Big-eyed Jewfish	LC
Fishes	Kajikia audax	Striped Marlin	NT
Fishes	Kali indica		LC
Fishes	Kali macrura		LC
Fishes	Katsuwonus pelamis	Skipjack Tuna	LC
Fishes	Kuhlia mugil		LC
Fishes	Kuhliarupestris	Jungle Perch	LC
Fishes	Kumococius rodericensis	Spiny Flathead	LC
Fishes	Labeobata	Minor Carp	LC
Fishes	Labeoboggit	Boggitlabeo	LC
Fishes	Lagocephalus inermis	Smooth Blasop	LC
Fishes	Lagocephalus lagocephalus	Oceanic Puffer	LC

Fishes	Lagocephalus lunaris	Lunartail Puffer	LC
Fishes	Lagocephalus scleratus	Silver-cheeked Toadfish	LC
Fishes	Lagocephalus spadiceus	Half-smooth Golden Pufferfish	LC
Fishes	Lamiopsis temminckii	Broadfin Shark	EN
Fishes	Lamnostoma orientale	Oriental Snake Eel	LC
Fishes	Lamnostoma polyophthalma	Ocellated Sand-eel	LC
Fishes	Leiognathus equulus	Common Ponyfish	LC
Fishes	Lepidocephalus guntea	Peppered Loach	LC
Fishes	Lepidocephalus thermalis		LC
Fishes	Liza tade		DD
Fishes	Loxodon macrorhinus	Sliteye Shark	LC
Fishes	Lutjanus johnii	John's Snapper	LC
Fishes	Lutjanus lunulatus	Lunartail Snapper	LC

Fishes	<i>Lutjanus lutjanus</i>	Bigeye Snapper	LC
Fishes	<i>Maculabatisgerrardi</i>	Whitespotted Whipray	VU
Fishes	<i>Manta birostris</i>	Giant Manta Ray	VU
Fishes	<i>Megachasma pelagios</i>	Megamouth Shark	LC
Fishes	<i>Megalops cyprinoides</i>	Indo-Pacific Tarpon	DD
Fishes	<i>Megatrygon microps</i>	Smalleye Stingray	DD
Fishes	<i>Melanocetus johnsonii</i>	Humpback Anglerfish	LC
Fishes	<i>Melanocetus murrayi</i>		LC
Fishes	<i>Melanostomias paucilaternatus</i>		LC
Fishes	<i>Microlophichthys microlophus</i>		LC
Fishes	<i>Mobula eregoodootenkee</i>	Longhorned Pygmy Devil Ray	NT
Fishes	<i>Mobula japonica</i>	Spinetail Devil Ray	NT
Fishes	<i>Mobula kuhlii</i>	Shortfin Devil Ray	DD
Fishes	<i>Mobula tarapacana</i>	Sicklefin Devil Ray	VU
Fishes	<i>Mobula thurstoni</i>	Bentfin Devil Ray	NT
Fishes	<i>Monopterus albus</i>	Rice swampeeel	LC
Fishes	<i>Mugil cephalus</i>	Flathead Mullet	LC
Fishes	<i>Mustelus mosus</i>	Arabian Smoothhound	DD
Fishes	<i>Narcine lingula</i>	Chinese Numbfish	DD
Fishes	<i>Narcin maculata</i>	Darkspotted Electric Ray	DD
Fishes	<i>Narcine timlei</i>	Brown Numbfish	DD
Fishes	<i>Narkedipterygia</i>	Spottail Sleeper Ray	DD
Fishes	<i>Nasobrevirostris</i>	Palefin Unicornfish	LC
Fishes	<i>Nas unicornis</i>	Bluespine Unicornfish	LC
Fishes	<i>Nebrius ferrugineus</i>	Tawny Nurse Shark	VU
Fishes	<i>Negaprion acutidens</i>	Sharptooth Lemon Shark	VU
Fishes	<i>Nemacheilus denisoni</i>		LC
Fishes	<i>Nematalosa galathea</i>	Galathea Gizzard Shad	LC
Fishes	<i>Nemichthys scolopaceus</i>	Slender Snipe Eel	LC

Fishes	<i>Nemipterus furcosus</i>	Fork-tailed Threadfin Bream	LC
Fishes	<i>Nemipterus peronii</i>	Notchedfin Treadfin Bream	LC
Fishes	<i>Nemipterus zysron</i>	Slender Threadfin Bream	LC
Fishes	<i>Neoceratiasspinifer</i>		LC
Fishes	<i>Neopomacentrus taeniurus</i>	Freshwater Damsel	DD
Fishes	<i>Neotropius atherinoides</i>		LC
Fishes	<i>Neotrygon kuhlii</i>	Bluespotted Maskray	DD
Fishes	<i>Notolychnus valdiviae</i>	Topside Lampfish	LC
Fishes	<i>Notopterus notopterus</i>		LC
Fishes	<i>Odontaspis noronhai</i>	Bigeye Sand Tiger	DD
Fishes	<i>Omobranchus ferox</i>	Gossamer Blenny	LC
Fishes	<i>Omobranchus punctatus</i>	Japanese Blenny	LC
Fishes	<i>Omobranchus smithi</i>		VU
Fishes	<i>Ompok bimaculatus</i>		NT
Fishes	<i>Ophiocara porocephala</i>	Spangled Gudgeon	LC
Fishes	<i>Ophisternon bengalense</i>	Bengal mudeel	LC
Fishes	<i>Oreichthys cosuatis</i>		LC
Fishes	<i>Oryzias dancena</i>	Indian ricefish	LC
Fishes	<i>Osteobrama vigorsii</i>	Godavari Osteobrama	LC
Fishes	<i>Ostorhinchus lateralis</i>	Humpback Cardinal	LC
Fishes	<i>Oxyurichthys microlepis</i>	Maned Goby	LC
Fishes	<i>Oxyurichthys opthalmonema</i>	Eye-brow Goby	LC
Fishes	<i>Oxyurichthys tentacularis</i>		DD
Fishes	<i>Paracaesiosordida</i>	Dirty Ordure Snapper	LC
Fishes	<i>Parachaetodon ocellatus</i>	Sixspine Butterflyfish	LC
Fishes	<i>Parachilognathus hodgarti</i>	Torrent Catfish	LC
Fishes	<i>Paragaleus randalli</i>	Slender Weasel Shark	NT
Fishes	<i>Paralepis elongata</i>	Barracudina	LC
Fishes	<i>Pateobatis jenkinsii</i>	Jenkins' Whipray	VU
Fishes	<i>Pellonaditchela</i>	Indian Pellona	LC

Fishes	<i>Pentherichthys atratus</i>		LC
Fishes	<i>Photonectes margarita</i>		LC
Fishes	<i>Photostomias atratus</i>		LC
Fishes	<i>Pisodonophis borro</i>		LC
Fishes	<i>Platycephalus indicus</i>	Bartail Flathead	DD
Fishes	<i>Platytrichtes apus</i>	Legless Sealsid	LC
Fishes	<i>Plectorhynchus gibbosus</i>	Brown Sweetlips	LC
Fishes	<i>Plicofollis dussumieri</i>	Blacktip Sea Catfish	LC

Fishes	<i>Pomacanthus annularis</i>	Bluering Angelfish	LC
Fishes	<i>Pomacanthus imperator</i>	Emperor Angelfish	LC
Fishes	<i>Pomacanthus semicirculatus</i>	Semicircle Angelfish	LC
Fishes	<i>Pomacanthus xanthurus</i>	Yellowface Angelfish	LC
Fishes	<i>Pomadasys argenteus</i>	Silver Javelin	LC
Fishes	<i>Poromitra megalops</i>	Ridgehead	DD
Fishes	<i>Prionace glauca</i>	Blue Shark	NT
Fishes	<i>Pristipomoides filamentosus</i>	Crimson Jobfish	LC
Fishes	<i>Pristipomoides multidens</i>	Goldbanded Jobfish	LC
Fishes	<i>Pristipomoides sieboldii</i>	Lavender Jobfish	LC
Fishes	<i>Pristipomoides zonatus</i>	Oblique-banded Snapper	LC
Fishes	<i>Pristis clavata</i>	Dwarf Sawfish	EN
Fishes	<i>Pristis pristis</i>	Large-tooth Sawfish	CR
Fishes	<i>Pristis zijsron</i>	Green Sawfish	CR
Fishes	<i>Psammogobius biocellatus</i>	Sleepy Goby	LC
Fishes	<i>Psenes arafurensis</i>	Banded Driftfish	LC
Fishes	<i>Pseudapocryptes elongatus</i>		LC
Fishes	<i>Pseudocarcharias kamoharui</i>	Crocodile Shark	NT
Fishes	<i>Puntius vittatus</i>		LC
Fishes	<i>Pygoplites diacanthus</i>	Royal Angelfish	LC
Fishes	<i>Rachycentron canadum</i>	Cobia	LC
Fishes	<i>Rasbora daniconius</i>	Slender Barb	LC

Fishes	<i>Rastrelliger faughni</i>	Island Mackerel	DD
Fishes	<i>Rastrelliger kanagurta</i>	Indian Mackerel	DD
Fishes	<i>Remora brachyptera</i>	Spearfish Remora	LC
Fishes	<i>Rhabdosargus sarba</i>	Goldlined Seabream	LC
Fishes	<i>Rhina ancylostoma</i>	Bowmouth Guitarfish	VU
Fishes	<i>Rhincodon typus</i>	Whale Shark	EN
Fishes	<i>Rhizoprionodon acutus</i>	Milk Shark	LC
Fishes	<i>Rhizoprionodon oligoinx</i>	Grey Sharpnose Shark	LC
Fishes	<i>Rhynchobatus laevis</i>	Smoothnose Wedgefish	VU
Fishes	<i>Rogadius pristiger</i>	Thorny Flathead	LC
Fishes	<i>Rondeletia loricata</i>	Redmouth Whalefish	LC
Fishes	<i>Salmophasiabalookee</i>	Bloch Razorbelly Minnow	LC
Fishes	<i>Sarda orientalis</i>	Oriental Bonito	LC
Fishes	<i>Sauridatumbil</i>	Greater Lizardfish	LC
Fishes	<i>Scartella emarginata</i>	Maned Blenny	LC
Fishes	<i>Scarus quoyi</i>	Quoy's Parrotfish	LC
Fishes	<i>Scatophagus argus</i>	Spotted Scat	LC
Fishes	<i>Scoliodon laticaudus</i>	Spadenose Shark	NT

Fishes	<i>Scomberomorus commerson</i>	Narrow-barred Spanish Mackerel	NT
Fishes	<i>Scomberomorus guttatus</i>	Indo-Pacific King Mackerel	DD
Fishes	<i>Scomberomorus koreanus</i>	Korean Seerfish	LC
Fishes	<i>Scomberomorus lineolatus</i>	Streaked Seerfish	LC
Fishes	<i>Scopelarchoides danae</i>		LC
Fishes	<i>Scopelarchus analis</i>	Blackbelly Pearleye	LC
Fishes	<i>Scopeloberyx robustus</i>	Longjaw Bigscale	DD
Fishes	<i>Scorpaenopsis venosa</i>	Raggy Scorpionfish	LC
Fishes	<i>Searsiakoefoedi</i>	Koefoed's Seerfish	LC
Fishes	<i>Setarches guentheri</i>	Deepwater Scorpionfish	LC
Fishes	<i>Sperata aor</i>	Long-whiskered Catfish	LC

Fishes	<i>Sphyrna lewini</i>	Scalloped Hammerhead	EN
Fishes	<i>Sphyrna mokarran</i>	Great Hammerhead	EN
Fishes	<i>Stegostomafasciatum</i>	Zebra Shark	EN
Fishes	<i>Sternoptyxdiaphana</i>	Diaphanous Hatchet Fish	LC
Fishes	<i>Sternoptyxpseudobscura</i>	Highlight Hatchetfish	LC
Fishes	<i>Stomiasaffinis</i>		LC
Fishes	<i>Stylephoruschordatus</i>	Tube-eye	LC
Fishes	<i>Synagrops japonicus</i>		LC
Fishes	<i>Syngnathoidesbiaculeatus</i>	Alligator Pipefish	LC
Fishes	<i>Synodusoculeus</i>	Large-eye Lizardfish	LC
Fishes	<i>Taaningichthysbathyphilus</i>	Deepwater Lanternfish	LC
Fishes	<i>Taenioidescirratus</i>	Whiskered Eel Goby	DD
Fishes	<i>Taeniurallymma</i>	Bluespotted Fantail Ray	NT
Fishes	<i>Taeniuropsmeyeni</i>	Blotched Fantail Ray	VU
Fishes	<i>Takifugu oblongus</i>	Lattice Blaasop	LC
Fishes	<i>Telatrygonzugei</i>	Sharpnose Stingray	NT
Fishes	<i>Tenualosailisha</i>	Hilsa	LC
Fishes	<i>Terapontheraps</i>	LargescaledTerapon	LC
Fishes	<i>Tetraodon fluviatilis</i>	Green Pufferfish	LC
Fishes	<i>Tetrarogeniger</i>		LC
Fishes	<i>Thamnaconusmelanoproctes</i>	Blackvent Filefish	DD
Fishes	<i>Thryssagautamiensis</i>	Gautama Thryssa	DD
Fishes	<i>Thryssamystax</i>	Moustached Thryssa	LC
Fishes	<i>Thunnus albacares</i>	Yellowfin Tuna	NT
Fishes	<i>Thysanophryscelebica</i>	Celebes Flathead	LC
Fishes	<i>Torpedo panthera</i>	Panther Torpedo	DD
Fishes	<i>Torquigenerhypsologeneion</i>	Orange-spotted Toadfish	LC
Fishes	<i>Toxotesjaculatrix</i>	Banded Archerfish	LC
Fishes	<i>Trachyrhamphusbicoarctatus</i>	Double-ended Pipefish	LC
Fishes	<i>Trachyrhamphuslongirostris</i>	Long-head pipefish	LC

Fishes	<i>Triaenodonobesus</i>	Whitetip Reef Shark	NT
Fishes	<i>Trigonalampamiriceps</i>	Threelights Dragonfish	LC
Fishes	<i>Tyleriusspinosissimus</i>	Spiny Blasop	LC
Fishes	<i>Uraspishelvola</i>	Whitetongue Jack	LC
Fishes	<i>Urogymnusasperrimus</i>	Porcupine Ray	VU
Fishes	<i>Valenciennellustripunctulatus</i>	Constellationfish	LC
Fishes	<i>Vinciguerrianimbaria</i>	Friiled Lighthouse Fish	LC
Fishes	<i>Wallago attu</i>		NT
Fishes	<i>Xestochilus nebulosus</i>		LC
Fishes	<i>Xiphasiasetifer</i>	Hairtail Blenny	LC
Fishes	<i>Xiphias gladius</i>	Swordfish	LC
Fishes	<i>Xiphocheilus typus</i>	Blue-toothed tuskfish	LC
Fishes	<i>Zebrasomadesjardinii</i>	Indian Sailfin Tang	LC
Fishes	<i>Zebrasoma scopas</i>	Brushtail Tang	LC
Fishes	<i>Zenarchopterusdispar</i>	Feathered River-garfish	LC
Fishes	<i>Zenarchopterusgilli</i>		LC
Fishes	<i>Zenopsisconchifer</i>	Silvery John Dory	LC
Invertebrates	<i>Aciagrion occidentale</i>		LC
Invertebrates	<i>Acisomapanorpoides</i>	Grizzled Pintail	LC
Invertebrates	<i>Acropora irregularis</i>		DD
Invertebrates	<i>Actinopyga miliaris</i>	Harry Blackfish	VU
Invertebrates	<i>Aethriamantabrevipennis</i>		LC
Invertebrates	<i>Agriocnemispygmaea</i>	Wandering Midget	LC
Invertebrates	<i>Allopatidesdendroeides</i>		DD
Invertebrates	<i>Anaxephippiger</i>	Vagrant Emperor	LC
Invertebrates	<i>Anaxguttatus</i>	Lesser Green Emperor	LC
Invertebrates	<i>Anax indicus</i>		LC
Invertebrates	<i>Archibasisoscillans</i>		LC
Invertebrates	<i>Arctides regalis</i>	Royal Spanish Lobster	LC
Invertebrates	<i>Assimineawoodmasoniana</i>		LC

Invertebrates	Auriculastrasubula		LC
Invertebrates	Bellamyia bengalensis		LC
Invertebrates	Biarctus sordidus	Pygmy Slipper Lobster	LC
Invertebrates	Bithynia cerameopoma		LC
Invertebrates	Bithynia pulchella		LC
Invertebrates	Bohadschiavitiensis	Brown Sandfish	DD
Invertebrates	Brachydiplaxsobrina		LC
Invertebrates	Brachythemiscontaminata		LC
Invertebrates	Bradinopygageminata		LC

Invertebrates	Ceriagrioncerinorubellum		LC
Invertebrates	Ceriagrioncoromandelianum		LC
Invertebrates	Ceriagrionolivaceum		LC
Invertebrates	Cerithiumcoralium	Coral Cerith	LC
Invertebrates	Clenchiellamicroscopica		LC
Invertebrates	Coelliccia didyma		LC
Invertebrates	Coeloserismayeri		LC
Invertebrates	Conus achatinus		LC
Invertebrates	Conus acutangulus		LC
Invertebrates	Conus amadis		LC
Invertebrates	Conus arenatus	Sand-dusted Cone	LC
Invertebrates	Conus articulatus		LC
Invertebrates	Conus aulicus		LC
Invertebrates	Conus bengalensis	Bengal Cone	LC
Invertebrates	Conus betulinus		LC
Invertebrates	Conus biliosus		LC
Invertebrates	Conus canonicus		LC
Invertebrates	Conus capreolus	Characteristic Cone	DD
Invertebrates	Conus characteristicus		LC
Invertebrates	Conus catus		LC
Invertebrates	Conus chaldaeus		LC

Invertebrates	Conus collisus	Stigmatic Cone	LC
Invertebrates	Conus consors		LC
Invertebrates	Conus coromandelicus		LC
Invertebrates	Conus coronatus		LC
Invertebrates	Conus cumingii	Cuming's Cone	LC
Invertebrates	Conus ebraeus		LC
Invertebrates	Conus eburneus		LC
Invertebrates	Conus episcopatus		LC
Invertebrates	Conus eximius		LC
Invertebrates	Conus figulinus		LC
Invertebrates	Conus flavidus	Yellow Pacific cone	LC
Invertebrates	Conus geographus		LC
Invertebrates	Conus glans		LC
Invertebrates	Conus hyaena	Hyena Cone	LC
Invertebrates	Conus inscriptus	Engraved Cone	LC
Invertebrates	Conus leopardus		LC
Invertebrates	Conus litoglyphus		LC
Invertebrates	Conus litteratus		LC
Invertebrates	Conus lividus		LC

Invertebrates	Conus longurionis		LC
Invertebrates	Conus loroisii		LC
Invertebrates	Conus malacanus	Malacca Cone	LC
Invertebrates	Conus maldivus	Maldiva Cone	LC
Invertebrates	Conus marmoreus	Marbled Cone	LC
Invertebrates	Conus miles		LC
Invertebrates	Conus miliaris		LC
Invertebrates	Conus mitratus		LC
Invertebrates	Conus monile	Necklace Cone	LC
Invertebrates	Conus nussatella		LC
Invertebrates	Conus obscurus		LC

Invertebrates	Conus pertusus		LC
Invertebrates	Conus quercinus		LC
Invertebrates	Conus rattus		LC
Invertebrates	Conus recluzianus		LC
Invertebrates	Conus sponsalis	Sponsal Cone	LC
Invertebrates	Conus striatellus		LC
Invertebrates	Conus striatus		LC
Invertebrates	Conus sulcatus		LC
Invertebrates	Conus suratensis		LC
Invertebrates	Conus terebra		LC
Invertebrates	Conus tessulatus		LC
Invertebrates	Conus textile		LC
Invertebrates	Conus tulipa		LC
Invertebrates	Conus vexillum		LC
Invertebrates	Conus virgo		LC
Invertebrates	Conus voluminalis		LC
Invertebrates	Conus zeylanicus		LC
Invertebrates	Coperamarginipes		LC
Invertebrates	Coperavittata		LC
Invertebrates	Cratillalineata		LC
Invertebrates	Cratillametallica		LC
Invertebrates	Diplacodestrivialis		LC
Invertebrates	Ellobiumaurisjudae	Judas Ear Cassidula	LC
Invertebrates	Epopthalmiavittata		LC
Invertebrates	Ferrissia verruca		LC
Invertebrates	Fungiacyclolites		LC
Invertebrates	Fungia fragilis		LC
Invertebrates	Gabbiaorcula		LC
Invertebrates	Gabbiastenothyroides		LC
Invertebrates	Gabbiatravancorica		LC

Invertebrates	Gibbularctusgibberosus		LC
Invertebrates	Gyraulusconvexiusculus		LC
Invertebrates	Helioporacoerulea	Blue Coral	VU
Invertebrates	Holothuriaarenicola		DD
Invertebrates	Holothuriaatra	Lollyfish	LC
Invertebrates	Holothuria edulis	Pinkfish	LC
Invertebrates	Holothuriaflavomaculata		LC
Invertebrates	Holothuriafuscocinerea		LC
Invertebrates	Holothuriafuscogilva		VU
Invertebrates	Holothuriahilla		LC
Invertebrates	Holothuria impatiens	Bottleneck Sea Cucumber	DD
Invertebrates	Holothuriainhabilis		LC
Invertebrates	Holothurialessoni	Golden Sandfish	EN
Invertebrates	Holothurialeucospilota	White Thread Fish	LC
Invertebrates	Holothuriamoebii		LC
Invertebrates	Holothuria pardalis		LC
Invertebrates	Holothuriapervicax		LC
Invertebrates	Holothuria rigida		LC
Invertebrates	Holothuriascabra	Golden Sandfish	EN
Invertebrates	Holothuriaspinifera		DD
Invertebrates	Indoplanorbissexustus		LC
Invertebrates	Inthaumbilicalis		LC
Invertebrates	Iravadiarohdei		LC
Invertebrates	Ischnura senegalensis	Tropical Bluetail	LC
Invertebrates	Labidodemasrugosum		LC
Invertebrates	Lamellidenscorrianus		LC
Invertebrates	Lestesconcinus	Dusky Spreadwing	LC
Invertebrates	Lestes elatus	Emerald Spreadwing	LC
Invertebrates	Lestesumbrinus		DD
Invertebrates	Littorariaundulata		LC

Invertebrates	<i>Lymnaea acuminata</i>		LC
Invertebrates	<i>Lymnaeabiaccuminata</i>		DD
Invertebrates	<i>Lymnaealuteola</i>		LC
Invertebrates	<i>Lymnaea persica</i>		LC
Invertebrates	<i>Lyriothemiscleis</i>		LC
Invertebrates	<i>Mekongiacrassa</i>		LC
Invertebrates	<i>Melampus sincaporensis</i>		LC
Invertebrates	<i>Melanoidestuberculata</i>		LC
Invertebrates	<i>Milleporaplatyphylla</i>	Firecoral	LC

Invertebrates	<i>Milleporatenera</i>		LC
Invertebrates	<i>Neritina violacea</i>	Red-mouth Nerite Snail	LC
Invertebrates	<i>Neurobasis chinensis</i>		LC
Invertebrates	<i>Onychargiaatrocyana</i>		LC
Invertebrates	<i>Orthetrumchrysis</i>		LC
Invertebrates	<i>Orthetrumluzonicum</i>		LC
Invertebrates	<i>Paelopatides insignis</i>		DD
Invertebrates	<i>Palinustuswaguensis</i>	Japanese Blunthorn Lobster	LC
Invertebrates	<i>Paludomus inflatus</i>		DD
Invertebrates	<i>Paludomustanschuaricus</i>		LC
Invertebrates	<i>Pantalaflavescens</i>	Wandering Glider	LC
Invertebrates	<i>Panulirushomarus</i>	Scalloped Spiny Lobster	LC
Invertebrates	<i>Panulirusornatus</i>	Ornate Spiny Lobster	LC
Invertebrates	<i>Panuliruspenicillatus</i>	Pronghorn Spiny Lobster	LC
Invertebrates	<i>Panuliruspolyphagus</i>	Mud Spiny Lobster	LC
Invertebrates	<i>Panulirus versicolor</i>	Painted Spiny Lobster	LC
Invertebrates	<i>Parreysiabonneaudi</i>		LC
Invertebrates	<i>Parreysiacorrugata</i>		LC
Invertebrates	<i>Parreysiafavidens</i>		LC
Invertebrates	<i>Pearsonothuriagraeffei</i>	Blackspotted Sea Cucumber	LC

Invertebrates	<i>Pila virens</i>		LC
Invertebrates	<i>Pisidium prasongi</i>		LC
Invertebrates	<i>Polychelestyplops</i>		LC
Invertebrates	<i>Polymesoda bengalensis</i>	Bengali Geloina	LC
Invertebrates	<i>Polymesoda expansa</i>	Marsh Clam	LC
Invertebrates	<i>Pomacealineata</i>		LC
Invertebrates	<i>Pseudagrion rubriceps</i>		LC
Invertebrates	<i>Rhinocyphabiforata</i>		LC
Invertebrates	<i>Rhyothemis variegata</i>		LC
Invertebrates	<i>Sermylariqueti</i>		LC
Invertebrates	<i>Stenothyra blanfordiana</i>		LC
Invertebrates	<i>Stereomastis nana</i>		LC
Invertebrates	<i>Stereomastis phosphorus</i>	Pink Blind Lobster	LC
Invertebrates	<i>Stichopus chloronotus</i>	Greenfish	LC
Invertebrates	<i>Stichopus herrmanni</i>	Curryfish	VU
Invertebrates	<i>Stichopus horrens</i>	Selenka's Sea Cucumber	DD
Invertebrates	<i>Stichopus monotuberculatus</i>		DD
Invertebrates	<i>Tarebiagranifera</i>		LC
Invertebrates	<i>Thelenota ananas</i>	Prickly Redfish	EN
Invertebrates	<i>Thelenota anax</i>	Amberfish	DD

Invertebrates	<i>Thenus indicus</i>	Mud Bug	DD
Invertebrates	<i>Thiararudis</i>		LC
Invertebrates	<i>Tholymistilla</i>	Old World Twister	LC
Invertebrates	<i>Tremea basilaris</i>	Keyhole Glider	LC
Invertebrates	<i>Tremea limbata</i>	Ferruginous Glider	LC
Invertebrates	<i>Trithemis aurora</i>		LC
Invertebrates	<i>Trithemis kirbyi</i>	Orange-winged Dropwing	LC
Invertebrates	<i>Trithemis pallidinervis</i>	Dancing Dropwing	LC
Invertebrates	<i>Tubipora musica</i>	Organ Pipe Coral	NT
Invertebrates	<i>Urothemis signata</i>		LC

Invertebrates	Willemoesia leptodactyla		LC
Invertebrates	Zygonyx torridus	Ringed Cascader	LC
Invertebrates	Zygonyx petiolatum	Long-tailed Duskdarter	LC
Mammals	Anathana ellioti	Madras Treeshrew	LC
Mammals	Aonyx cinereus	Asian Small-clawed Otter	VU
Mammals	Axis axis	Chital	LC
Mammals	Balaenoptera acutorostrata	Common Minke Whale	LC
Mammals	Balaenoptera edeni	Bryde's Whale	DD
Mammals	Balaenoptera musculus	Blue Whale	EN
Mammals	Bandicota bengalensis	Lesser Bandicoot Rat	LC
Mammals	Bandicota indica	Greater Bandicoot Rat	LC
Mammals	Boselaphus tragocamelus	Nilgai	LC
Mammals	Canis aureus	Golden Jackal	LC
Mammals	Cuon alpinus	Dhole	EN
Mammals	Cynopterus sphinx	Greater Shortnosed Fruit Bat	LC
Mammals	Eonycteris spelaea	Dawn Bat	LC
Mammals	Felis chaus	Jungle Cat	LC
Mammals	Feresa attenuata	Pygmy Killer Whale	DD
Mammals	Funambulus palmarum	Common Palm Squirrel	LC
Mammals	Funambulus pennantii	Five-striped Palm Squirrel	LC
Mammals	Globicephala macrorhynchus	Short-finned Pilot Whale	DD
Mammals	Grampus griseus	Risso's Dolphin	LC
Mammals	Herpestes edwardsii	Indian Grey Mongoose	LC
Mammals	Herpestes smithii	Ruddy Mongoose	LC
Mammals	Hipposideros speoris	Schneider's Leaf-nosed Bat	LC
Mammals	Hystrix indica	Indian Crested Porcupine	LC
Mammals	Indopacetus pacificus	Indo-pacific Beaked Whale	DD
Mammals	Kogia breviceps	Pygmy Sperm Whale	DD
Mammals	Kogia sima	Dwarf Sperm Whale	DD

Mammals	Lagenodelphishosei	Fraser's Dolphin	LC
Mammals	Lepus nigricollis	Indian Hare	LC
Mammals	Lutrogaleperspicillata	Smooth-coated Otter	VU
Mammals	Macaca mulatta	Rhesus Monkey	LC
Mammals	Manis crassicaudata	Indian Pangolin	EN
Mammals	Megaderma lyra	Greater False Vampire	LC
Mammals	Megaptera novaeangliae	Humpback Whale	LC
Mammals	Mellivora capensis	Honey Badger	LC
Mammals	Mesoplodon densirostris	Blainville's Beaked Whale	DD
Mammals	Mesoplodon ginkgodens	Ginkgo-toothed Beaked Whale	DD
Mammals	Moschiola indica	Indian Chevrotain	LC
Mammals	Muntiacus vaginalis	Northern Red Muntjac	LC
Mammals	Murinacyclotis	Round-eared Tube-nosed Bat	LC
Mammals	Mus booduga	Little Indian Field Mouse	LC
Mammals	Mus musculus	House Mouse	LC
Mammals	Mus platythrix	Brown Spiny Mouse	LC
Mammals	Mus terricolor	Earth-colored Mouse	LC
Mammals	Myotis montivagus	Burmese Whiskered Myotis	LC
Mammals	Neophocaenaphocaenoides	Indo-Pacific Finless Porpoise	VU
Mammals	Orcaellabrevirostris	Irrawaddy Dolphin	EN
Mammals	Orcinus orca	Killer Whale	DD
Mammals	Panthera pardus	Leopard	VU
Mammals	Paradoxurus hermaphroditus	Common Palm Civet	LC
Mammals	Peponocephalaelectra	Melon-headed Whale	LC
Mammals	Physeter macrocephalus	Sperm Whale	VU
Mammals	Pipistrellus ceylonicus	Kelaart's Pipistrelle	LC
Mammals	Pipistrellus tenuis	Least Pipistrelle	LC
Mammals	Prionailurus bengalensis	Leopard Cat	LC

Mammals	<i>Prionailurus rubiginosus</i>	Rusty-spotted Cat	NT
Mammals	<i>Pseudorca crassidens</i>	False Killer Whale	DD
Mammals	<i>Pteropus giganteus</i>	Indian Flying Fox	LC
Mammals	<i>Rattus rattus</i>	House Rat	LC
Mammals	<i>Rhinolophus lepidus</i>	Blyth's Horseshoe Bat	LC
Mammals	<i>Rhinolophus pusillus</i>	Least Horseshoe Bat	LC
Mammals	<i>Rhinolophus rouxii</i>	Rufous Horseshoe Bat	LC
Mammals	<i>Rousettus leschenaultii</i>	Leschenault's Rousette	LC
Mammals	<i>Rusa unicolor</i>	Sambar	VU
Mammals	<i>Scotophilus heathii</i>	Greater Asiatic Yellow House Bat	LC
Mammals	<i>Semnopithecus entellus</i>	Northern Plains Gray Langur	LC
Mammals	<i>Stenella attenuata</i>	Pantropical Spotted Dolphin	LC
Mammals	<i>Stenella coeruleoalba</i>	Striped Dolphin	LC

Mammals	<i>Stenella longirostris</i>	Spinner Dolphin	DD
Mammals	<i>Steno bredanensis</i>	Rough-toothed Dolphin	LC
Mammals	<i>Suncus murinus</i>	House Shrew	LC
Mammals	<i>Sus scrofa</i>	Wild Boar	LC
Mammals	<i>Taphozous longimanus</i>	Long-winged Tomb Bat	LC
Mammals	<i>Tatera indica</i>	Indian Gerbil	LC
Mammals	<i>Tetracerus quadricornis</i>	Four-horned Antelope	VU
Mammals	<i>Tursiops aduncus</i>	Indo-Pacific Bottlenose Dolphin	DD
Mammals	<i>Tursiops truncatus</i>	Common Bottlenose Dolphin	LC
Mammals	<i>Viverricula indica</i>	Small Indian Civet	LC
Mammals	<i>Vulpes bengalensis</i>	Bengal Fox	LC
Mammals	<i>Ziphius cavirostris</i>	Cuvier's Beaked Whale	LC
Plants	<i>Acmella paniculata</i>	Panicled Spot Flower	LC
Plants	<i>Acrostichum aureum</i>	Golden Leather Fern	LC
Plants	<i>Aegialitis rotundifolia</i>		NT

Plants	Aegiceras corniculatum		LC
Plants	Anacyclus pyrethrum	Atlas Daisy	VU
Plants	Avicennia alba		LC
Plants	Avicennia marina	Gray Mangrove	LC
Plants	Avicennia officinalis		LC
Plants	Brownlowia tersa		NT
Plants	Bruguiera cylindrica		LC
Plants	Bruguiera gymnorhiza	Oriental Mangrove	LC
Plants	Bruguiera parviflora	Smallflower Bruguiera	LC
Plants	Carex baccans	Crimson Seeded Sedge	LC
Plants	Carex hebecarpa		LC
Plants	Ceratopteris thalictroides		LC
Plants	Ceriops decandra		NT
Plants	Ceriops tagal		LC
Plants	Commelinacaroliniana		LC
Plants	Commelina subulata		LC
Plants	Crotalaria quinquefolia		LC
Plants	Cyanotis sarcotensis		LC
Plants	Cyclosorus interruptus	Hottentot Fern	LC
Plants	Cyperus amabilis		LC
Plants	Cyperus arenarius		LC
Plants	Cyperus castaneus		LC
Plants	Cyperus clarkei		LC
Plants	Cyperus compactus		LC
Plants	Cyperus cyperoides		LC
Plants	Cyperus diffusus	Dwarf Umbrella Grass	LC
Plants	Cyperus digitatus	Finger Flat sedge	LC
Plants	Cyperus distans	Slender Cyperus	LC
Plants	Cyperus dubius		LC
Plants	Cyperus esculentus	Yellow Nutsedge	LC

Plants	<i>Cyperus longus</i>	Sweet Cyperus	LC
Plants	<i>Cyperus michelianus</i>	Souchet De Michel	LC
Plants	<i>Cyperus nutans</i>		LC
Plants	<i>Cyperus pilosus</i>		LC
Plants	<i>Cyperus pulchellus</i>		LC
Plants	<i>Cyperus tenuispica</i>		LC
Plants	<i>Cyperus tuberosus</i>	Nut Grass	LC
Plants	<i>Diplazium esculentum</i>		LC
Plants	<i>Dopatrium nudicaule</i>		LC
Plants	<i>Echinochloa frumentacea</i>		LC
Plants	<i>Eclipta prostrata</i>	Eclipte Blanche	LC
Plants	<i>Eleocharis geniculata</i>	Canada Spikesedge	LC
Plants	<i>Eleocharis spiralis</i>		LC
Plants	<i>Elytrophorus spicatus</i>	Spike Grass	LC
Plants	<i>Emilia zeylanica</i>		LC
Plants	<i>Equisetum giganteum</i>	Southern Giant Horsetail	LC
Plants	<i>Eragrostis japonica</i>	Pond Lovegrass	LC
Plants	<i>Eriocaulon parviflorum</i>		LC
Plants	<i>Eriocaulon truncatum</i>	Short Pipe-Wort	LC
Plants	<i>Eriochloa procera</i>	Spring Grass	LC
Plants	<i>Excoecaria agallocha</i>		LC
Plants	<i>Fimbristylis acuminata</i>		LC
Plants	<i>Fimbristylis alboboviridis</i>		LC
Plants	<i>Fimbristylis bisumbellata</i>	Fimbristylis à Deux Ombelles	LC
Plants	<i>Fimbristylis cinnamometorum</i>		LC
Plants	<i>Fimbristylis complanata</i>		LC
Plants	<i>Fimbristylis dipsacea</i>	Harper's Fimbristylis	LC
Plants	<i>Fimbristylis ferruginea</i>	West Indian Fimbry	LC
Plants	<i>Fimbristylis littoralis</i>	Lesser Fimbristylis	LC
Plants	<i>Fimbristylis ovata</i>		LC

Plants	Fimbristylis polytrichoides		LC
Plants	Fimbristylis schoenoides	Ditch Fimbry	LC
Plants	Fimbristylis tetragona		LC
Plants	Fuirena cuspidata		LC
Plants	Fuirena pubescens	Fuirène Pubescent	LC
Plants	Fuirena umbellata	Yefen	LC
Plants	Halodule pinifolia	Species code: Hp	LC
Plants	Halodule uninervis	Species code: Hu	LC
Plants	Halodule wrightii	Species code: Hw	LC
Plants	Halophila beccarii	Ocean Turf Grass	VU
Plants	Halophila ovalis	Species code: Ho	LC
Plants	Halophila ovata	Species code: Hq	LC
Plants	Hemarthria compressa	Whip Grass	LC
Plants	Heritiera littoralis		LC
Plants	Homonoia riparia	Willow-Leaved Water Croton	LC
Plants	Hoppea dichotoma		LC
Plants	Hydrobryopsis sessilis		LC
Plants	Hydrocotyle javanica		LC
Plants	Hydrocotyles ibthorpioides		LC
Plants	Hygrophila balsamica		LC
Plants	Hygrophila difformis		LC
Plants	Hygrophila quadrivalvis		LC
Plants	Isachne albens		LC
Plants	Isachne globosa	Swamp Millet	LC
Plants	Isachne pulchella		LC
Plants	Justicia quinqueangularis		LC
Plants	Kyllingia melanosperma		LC
Plants	Kyllingia nemoralis	White Water Sedge	LC
Plants	Lemnagibba	Fat Duckweed	LC

Plants	Leptochloafusca		LC
Plants	Leptochloaneesii	Umbrella Canegrass	LC
Plants	Leptochloapanicea	Mucronate Sprangletop	LC
Plants	Linderniaoppositifolia		LC
Plants	Lipocarpha chinensis		LC
Plants	Ludwigiahyssopifolia	Seed Box	LC
Plants	Ludwigia perennis		LC
Plants	Lumnitzera racemosa		LC
Plants	Medicago sativa	Alfalfa	LC
Plants	Myriophyllum indicum		LC
Plants	Myriophyllum oliganthum		LC
Plants	Myriophyllum tuberculatum		LC
Plants	Nymphoides hydrophylla		LC
Plants	Nymphoides indica	Water-snowflake	LC
Plants	Nymphoides parvifolia		LC
Plants	Ophioglossum lusitanicum	Least Adder's-tongue	LC

Plants	Phyllanthus nodiflorus	Turkey Tangle Frogfruit	LC
Plants	Polytrias indica	Batiki Bluegrass	LC
Plants	Prunus bifrons		DD
Plants	Pycnospora polystachya	Bunchy Flat Sedge	LC
Plants	Queenslandia lalage	Queensland Sedge	LC
Plants	Rhizophora apiculata		LC
Plants	Rhizophora mucronata	Mangrove	LC
Plants	Scyphiphora hydrophyllacea		LC
Plants	Sonneratia apetala		LC
Plants	Thelypteris xyloides		LC
Plants	Xylocarpus granatum		LC
Plants	Xyris indica		LC
Reptiles	Acrochordus granulatus	Wart Snake	LC
Reptiles	Astrotiastokesii	Stokes' Sea Snake	LC

Reptiles	Atretiumschistosum	Olive Keelback Water Snake	LC
Reptiles	Caretta caretta	Loggerhead Turtle	VU
Reptiles	Chamaeleo zeylanicus	Asian Chameleon	LC
Reptiles	Chitra indica	Indian Narrow-headed Softshell Tu	rtleEN
Reptiles	Crocodylus palustris	Mugger	VU
Reptiles	Crocodylus porosus	Salt-water Crocodile	LR/lc
Reptiles	Dermochelys coriacea	Leatherback	VU
Reptiles	Enhydrina schistosa	Beaked Sea Snake	LC
Reptiles	Eretmochelys imbricata	Hawksbill Turtle	CR
Reptiles	Eublepharis hardwickii	Eastern Indian Leopard Gecko	LC
Reptiles	Eutropis allapallensis	Schmidt's Mabuya	LC
Reptiles	Eutropis carinata	Keeled Indian Mabuya	LC
Reptiles	Hemidactylus frenatus	Common House Gecko	LC
Reptiles	Hemidactylus maculatus	Spotted Leaf-toed Gecko	LC
Reptiles	Hemidactylus subtriangulus	Madras Blotched Gecko	DD
Reptiles	Hemidactylus treutleri		LC
Reptiles	Hydrophis caeruleus	Dwarf Sea Snake	LC
Reptiles	Hydrophis cantoris	Gunther's Sea Snake	DD
Reptiles	Hydrophis cyanocinctus	Bluebanded Sea Snake	LC
Reptiles	Hydrophis fasciatus	Striped Sea Snake	LC
Reptiles	Hydrophis gracilis	Graceful Small Headed Seasnake	LC
Reptiles	Hydrophis lapemoides	Persian Gulf Sea Snake	LC
Reptiles	Hydrophis mamillaris	Bombay Sea Snake	DD
Reptiles	Hydrophis ornatus	Ornate Reef Sea Snake	LC
Reptiles	Hydrophis platurus	Yellow-bellied Sea Snake	LC
Reptiles	Hydrophis spiralis	Yellow Sea Snake	LC
Reptiles	Hydrophis stricticollis	Collared Sea Snake	DD
Reptiles	Kerilia jerdoni	Jerdon's Sea Snake	LC
Reptiles	Lapemis curtus	Spine-bellied Sea Snake	LC

Reptiles	<i>Laticauda colubrina</i>	Yellow-lipped Sea Krait	LC
Reptiles	<i>Laticaudalaticaudata</i>	Brown-lipped Sea Krait	LC
Reptiles	<i>Lepidochelys olivacea</i>	Olive Ridley	VU
Reptiles	<i>Lissemys punctata</i>	Indian Flapshell Turtle	LR/lc
Reptiles	<i>Lycodontravancoricus</i>	Travancore Wolf Snake	LC
Reptiles	<i>Oligodontaeniolatus</i>	Streaked Kukri Snake	LC
Reptiles	<i>Ophiophagus hannah</i>	King Cobra	VU
Reptiles	<i>Pangshura tentoria</i>	Indian Tent Turtle	LR/lc
Reptiles	<i>Pseudocerastespersicus</i>	Perisan Horned Viper	LC
Reptiles	<i>Sitanaponticeriana</i>	Fan Throated Lizard	LC
Reptiles	<i>Thalassophinaviperina</i>	Viperine Sea Snake	LC
Reptiles	<i>Trimeresurusgramineus</i>	Common Bamboo Viper	LC
Reptiles	<i>Varanus bengalensis</i>	Common Indian Monitor	LC
Reptiles	<i>Varanus salvator</i>	Common Water Monitor	LC

About IBAT

The Integrated Biodiversity Assessment Tool (IBAT) provides key decision-makers with access to critical information on biodiversity priority sites to inform risk management and decision-making processes that address potential biodiversity impacts. Developed through a partnership of BirdLife International, Conservation International, International Union for Conservation of Nature (IUCN) and United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC), the vision of IBAT is that decisions affecting critical natural habitats are informed by the best scientific information and in turn decision makers will support the quest to collect and enhance the underlying datasets and maintain that scientific information

Appendix 11: Environment Safeguards QPR checklist²⁸

Activity	Yes / No	Remarks (If Answer Is No)
<i>A. For subproject packages under bidding</i>		
1. IEEs cleared by ADB?		
2. IEEs/EMPs included in the bidding documents?		
3. Are there changes in the scope of work of the cleared IEEs?		
4. Core labor standards and environment, health and safety (EHS) incorporated in Section 8 (or appropriate section) of the bid documents?		
5. BOQ line item includes EMP requirements?		
6. IEE disclosed in form and language understood by stakeholders and affected persons (APs)?		
<i>For subproject packages with contracts awarded (no works yet)</i>		
1. All statutory clearances/permits obtained?		
2. Each contractor appointed EHS and/or safety officer?		
3. Baseline regarding condition of roads, agricultural land and other infrastructure prior to start of transportation of materials and construction has been recorded?		
4. Contractor has established tie-ups with local hospitals/clinics for emergencies onsite?		
5. For DBO packages, detailed design completed and updated IEE submitted to ADB?		
6. For civil works packages, site-specific EMP submitted to ADB?		
<i>For subproject packages with contracts awarded and works on-going</i>		
1. Contractors have appointed EHS and/or safety officer onsite per subproject package?		
2. Site-specific EMP posted on site?		
3. Contractors' records of accidents / incidents submitted to PMU on a monthly basis?		
4. Contractors provided PMU with a notification/incident report of any accident(s)		
5. Reports of complaints/grievances reported monthly to PMU?		
6. Records of information disclosure/consultations submitted by PIUs to PMU monthly?		
7. Records of site inspection by PIU submitted to PMU monthly?		

²⁸ This checklist should provide the Project's **general** compliance to environment safeguards during the reporting period. The indicators are aligned with project loan agreement, PAM, IEEs and ADB's Sustainable Development Safeguards Division Safeguards project performance rating. The detailed environmental safeguards compliance status should be provided in the semi-annual environmental monitoring report.

Appendix 12: Government order no GO.RT. No. 163 dated 08-06-2018 for establishment of Grievance Redressal Mechanism

GOVERNMENT OF ANDHRA PRADESH ABSTRACT

VCICDP - Establishment of Project Grievance Redress Mechanism (GRM) at three levels to cover both environmental and social issues - Orders - Issued.

=====

INDUSTRIES AND COMMERCE (INFRA) DEPARTMENT

G.O.RT.No. 163

Dated: 08-06-2018

Read the following:

1. Facility Administrative Manual (FAM) of VCICDP.
2. From the Commissioner of Industries, Vijayawada, 15/1/2014/11427/VCIC-GRM. Dated:31-05-2018 &&&

ORDER:

In the reference 2nd read above, the Commissioner of Industries has stated that at SI. No. 95, Page No. 42 of the Facility Administrative Manual of the VCICDP, the Project Grievance Redress Mechanism (GRM) is envisaged, wherein, it is directed to establish Project GRM at three levels to cover both Environmental and Social issues.

2. The Commissioner of Industries has proposed for establishment of Project Grievance Redress Mechanism at three levels with the following provisions and requested the Government to take a view on the establishment of Project GRM and issue orders:-

- a. The GRM shall be established and disclosed to the project affected communities.
- b. The Project Grievance Redress Committee, supported by the consultants of PMSC and Safeguard officers of both the PMU and PIUs, will be responsible for timely redress of grievances on Environmental and Social Safeguards issues.
- c. The Grievance Redress Committee is also responsible for Registration of Grievances, Related Disclosure and Communication with the aggrieved parties.
- d. A complaint register shall be maintained at the field unit, PIU and PMU levels with details of 1. Complaint lodged, 2. Date of Personal Hearing, 3. Action Taken and 4. Date of communication sent to the complainant.
- e. Contact Details, Procedure and Complaint Mechanism shall be disclosed to the Project Affected Communities at accessible locations and through various Media (Leaflets, Newspapers etc.,)

3. Government after careful examination of the proposal, hereby establish the Project Grievance Redress Mechanism at three levels is as follows:-

1st Level Grievance:

The Contact Number of the PIU office should be made available at the construction site signboards. The contractor and field unit staff can immediately resolve onsite, seek the advice of the PIU Safeguard Manager as required, within seven (7) days of receipt of the complaint / grievance.

2nd Level Grievance:

All grievances that could not be redressed within seven (7) days at Field / Ward level shall be reviewed by the GRC at District Level headed by Joint Collector of the respective District. GRC shall attempt to resolve them within fifteen (15) Days. The Safeguard Manager of the PIU shall be responsible to see through the process of redressal of each grievance.

(P.T.O)

-3-

- e) The GRC will continue to function, for the benefit of the displaced persons, during the entire life of the project including the defects liability period. The entire resettlement component of the project has to be completed before the construction starts, and pending grievances resolved. Other than disputes relating to ownership rights and apportionment issues on which the LARR Authority has jurisdiction.
- f) GRC will review grievances involving all resettlement benefits, relocation and payment of assistances.
- g) The GRCs will function out of each district where the subprojects are being implemented. The existing setup for coordination, monitoring and grievance redress at district level which meets once a month, will be used for VCICDP.
- h) An annual fund of Rs.1.00 Lakhs shall be allocated to each GRC for their operations like convening monthly review meetings, preparing and distributing brochures, leaflets etc.

6. The Project Director, PMU, VCICDP shall be the Appellate Authority and shall be supported by the Safeguards Officer of PMU, VCICDP and the Team Leader of PMSC. This shall be the highest Grievance Redressal Mechanism at the project level.

7. The Project Monitoring Unit (PMU), Project Implementing Units (PIUs) and Grievance Redressal Committees (GRCs) shall update the status of complaints / grievances in the VCIC Web-Site.

5. The Project Director, PMU, VCICDP shall take further necessary action in the matter, accordingly.

(BY ORDER AND IN THE NAME OF THE GOVERNOR OF ANDHRA PRADESH)

S.SOLOMON AROKIJARAJ
SECRETARY TO GOVERNMENT & CIP

To

The Project Director, Project Monitoring Unit, VCICDP, Vijayawada.

The Chairman and all the members through PD, PMU, Vijayawada.

Copy to:

The District Collectors, Visakhapatnam, East Godavari, Krishna and SPS Nellore.

P.S. to Minister for Industries

P.S. to Prl. Secretary to CM (GSP)

Sc/Sf

//FORWARDED BY: ORDER//

SECTION OFFICER

Appendix 13: Health and Safety Plan VCICDP Project 2

SOP-Health and Safety Plan for COVID19 Pandemic

Document Stage: Final

June 2020

Loan 3430-IND and Grant 0495: Visakhapatnam-Chennai Industrial Corridor Development Program, Project 1

Visakhapatnam-Chennai Industrial Corridor Development Program, Tranche 2



Prepared by Government of Andhra Pradesh for the Asian Development Bank.

CONTENTS

1	INTRODUCTION
2	Principles of worker protection
3	MAXIMUM PRECAUTION FOR PERSONS/LABOURERS REPORTING TO WORK
4	COVID-19 Typical Symptoms
5	SELF-ATTESTATIONS BY PERSONS/LABOUR PRIOR TO WORK
6	GENERAL DIRECTION
7	WORK-SITE PREVENTION PRACTICES
8	WASHING FACILITY
9	CLEANING PROCEDURES
10	LABOUR CAMP
10.1	Toilet Facility
10.2	Eating/snacks Arrangements
10.3	Changing Facilities, Showers and Drying Areas
11	UPDATES ON COVID-19
12	Training
13	Emergency contact

1 INTRODUCTION

- This document is intended to supplement formal H&S policies, procedures and plans that the contractor has in place for its employees and staff working on VCICDP projects under loan 3430-IND and Grant 0495 and Visakhapatnam-Chennai Industrial Corridor Development Program Tranche 2. Hence, this document is not intended to replace any formalized procedures currently in place for the Contractor. Where this guideline does not meet or exceed the standards put forth by the Contractor, the Contractor shall abide by the most stringent procedure available.
- This approved project specific Health and Safety Plan (H&SP) shall be modified to require that the COVID-19 Officer (supervised by the contractor's environmental and health and safety officer) at the Contractor's worksite (appointed by Contractor and agreed by PIU) submit a written daily report to the Client's Representative (PIU Head). The COVID-19 Officer shall certify that the Contractor and all subcontractors are in full compliance with these guidelines.
- The COVID-19 officer should be present on site at all times.
- Any issue of non-compliance with these guidelines shall be a basis for the suspension of work. The Contractor will be required to submit a corrective action plan (on the next day or immediately as per the nature of issue) detailing each issue of non-conformance and a plan to rectify the issue(s). The Contractor will not be allowed to resume work until the plan is approved by the Client (PIU). Any additional issues of non-conformance may be subject to action against the Contractor's as health & safety/safeguard clauses of the contract.
- Construction sites operating during the Covid-19 pandemic need to ensure they are protecting their WORKFORCE and minimising the risk of spread of infection.
- This guidance is intended to introduce consistent measures on sites of all sizes in line with the Government's recommendations on social distancing.
- These are exceptional circumstances and the industry must remain abreast of and comply with the latest Government advice on COVID-19 at all times.
- The health and safety requirements of any construction activity must also not be compromised at this time. If an activity cannot be undertaken safely due to a lack of suitably qualified personnel being available or social distancing being implemented, it should not take place.
- It is to be noted that emergency services are also under great pressure and may not be in a position to respond as quickly as usual.

- Sites should remind the workforce at every opportunity of the Worksite Procedures which are aimed at protecting them, their colleagues, their families and the Andhra Pradesh population.

If a worksite is not consistently implementing the measures in this document, it may be required to shut down.

2 PRINCIPLES OF WORKER PROTECTION

- Consistently practice social distancing
- Cover coughs and sneezes
- Maintain hand hygiene
- Clean surfaces frequently

3 MAXIMUM PRECAUTION FOR PERSONS/LABOURERS REPORTING TO WORK

- IF SICK, STAY HOME!
- IF SICK, GO HOME!
- IF SOMEONE SICK, SEND THEM HOME!

Contractor to provide face masks (of the type approved by Government for use to protect persons from COVID-19) to all persons working in or visiting the worksite. This along with procedures set out in this document is for maximum precaution to protect all persons/labourers at all times.

4 COVID-19 TYPICAL SYMPTOMS

- Fever
- Cough
- Shortness of Breath
- Sore Throat

All persons at the worksite should have their temperature screened by COVID-19 officer with Infrared Thermometer (handheld non-contact).

5 SELF-ATTESTATION BY PERSONS/LABOUR PRIOR TO WORK

Prior to starting a work (on daily basis), each labour /worker will self-attest to the supervisor:

- no signs of COVID-19 symptoms within the past 24 hours.

- No contact with an individual diagnosed with COVID-19. (contact means living with a positive person, being within 6 ft of positive person OR sharing things of positive person)
- Not undergone quarantine or isolation (in case of any labourer /worker who has been quarantined or isolated previously, the engagement shall be only after obtaining the requisite clearance)

The engagement of workers falling in the high-risk category such as workers over the age of 55 years, with underlying medical conditions or health issues, etc. should be done only after obtaining the requisite clearance from trained and registered medical practitioners.

The self-attestation would be verified in collaboration with trained and registered medical practitioners deployed at site through discussions with laborers /workers and/or preliminary checks such as temperature checks, etc. prior to their engagement at site.

In addition, the Contractor shall mandatorily follow all medical test requirements for the workers prior to their engagement and/or mobilization at site as per the guidelines issued by the Central and State government agencies and WHO from time to time.

Persons/Labourers showing COVID-19 symptoms or not providing self-attestation shall be directed to leave the work site and report to the fever clinic/quarantine centre immediately. Labour not to return to the work site until cleared by fever clinic/quarantine centre.

6 GENERAL DIRECTION

- No handshake, Only Namaste
- Non-essential physical work that requires close contact between workers should not be carried out
- Work requiring physical contact should not be carried out
- Plan all other work to minimise contact between workers
- Wash hands often (every 1-2 hrs or frequently as possible) with soap for at least 20 seconds
- Use hand sanitizer
- No person should enter the work site other than the authorized persons mentioned by supervisor during start of work
- All must implement social distancing by maintaining a minimum distance of 6-feet from others at all times to eliminate the potential of cross contamination.
- Avoid face to face meetings – critical situations requiring in-person discussion must follow social distancing i.e., 6 ft from others.

- Conduct all meetings via conference calls, if possible. Do not convene meetings of more than 10 people. Recommend use of cell phones, texting, web meeting sites and conference calls for project discussion
- All individual work group meetings/ talks should follow social distancing
- At each job briefing/toolbox talk, employees are asked if they are experiencing any symptoms, and are sent home if they are
- Each worksite should have laminated COVID-19 safety guidelines and handwashing instructions
- All restroom/toilet facilities should be cleaned (min twice a day), and handwashing facility must be provided with soap, hand sanitizer and paper towels
- All surfaces should be regularly cleaned, including mobiles, tabletops /surfaces, door handles, laptops, records, etc.
- All common areas and meeting areas are to be regularly cleaned (min twice a day) and disinfected at least twice a day
- All persons to maintain their own water bottle, and should not be shared.
- To avoid external contamination, it is recommended everyone bring food from home
- Please maintain Social Distancing separation during breaks and lunch.
- Cover coughing or sneezing with a tissue, then throw the tissue in the trash and wash hands, if no tissue is available then cough /sneeze into your upper sleeves or elbow. Do not cough or sneeze into your hands.
- Clean your hands after coughing or sneezing thoroughly by using soap and water (minimum for 20 seconds). If soap and water are not available, please use a hand sanitizer. The Contractor shall ensure adequate quantities of sanitizer and soap are made available at all locations including site offices, meeting rooms, corridors, washrooms /toilets, etc. as appropriate.
- Avoid touching eyes, nose, and mouth with your hands
- To avoid sharing germs, please clean up after Yourself. DO NOT make others responsible for moving, unpacking and packing up your personal belongings
- If you or a family member is feeling ill, stay home!
- Work schedules are adjusted to provide time for proper cleaning and disinfecting as required.

7 WORK-SITE PREVENTION PRACTICES

- At the start of each shift, confirm with all employees that they are healthy and inform all workers of reusable and disposable PPE.
- Outside person(s) should be strictly prohibited at worksite
- All construction workers will be required to wear cut-resistant gloves or the equivalent.
- Use of eye protection (reusable safety goggles/face shields) is recommended. The supply of eye protection equipment to the workers is considered as a standard part of PPE during construction works.
- In work conditions where required social distancing is impossible to achieve, such employees shall be supplied with standard face mask, gloves, and eye protection.
- All employees shall drive to work site as per the prevailing guidelines of the Government in a single occupant vehicle. Staff shall not ride together in the same vehicle
- When entering a machine or vehicle which you are not sure you were the last person to enter, make sure that you wipe down the interior and door handles with disinfectant (with 1% sodium hypochlorite solution daily) prior to entry. Adequate quantity of the disinfectant shall be provided by the Contractor at all such site-specific locations.
- Workers should maintain separation of 6' from each other.
- Multi person activities will be limited where feasible (two persons lifting activities)
- Gathering places on the site such as sheds and/or break areas will be eliminated, and instead small break areas will be used with seating limited to ensure social distancing.
- Contact the cleaning person of the worksite and ensure proper COVID-19 sanitation processes. Increase cleaning/disinfection visits to at least 2 times a day. Cleaning person(s) to be provided with gloves, gown and face mask for each cycle of cleaning. The Contractor shall make available adequate supply of PPE and chemicals while the threat of COVID-19 continues.
- Clean all high contact surfaces a minimum of twice a day in order to minimize the spread of germs in areas that people touch frequently. This includes but is not limited to desks, laptops and vehicles
- All employees to maintaining good health by getting adequate sleep; eating a balanced, healthy diet, avoid alcohol; and consume plenty of fluids.

- Continuation of works in construction project with workers available on site and no workers to be brought in from outside
- The site offices shall have adequate ventilation. The air conditioning or ventilation systems installed at the site offices would have high-efficiency air filters to reduce the risk of infection. The frequency of air changes may be increased for areas where close personal proximity cannot be fully prevented such as control rooms, elevators, waiting rooms, etc.
- The Contractor shall carry out contactless temperature checks for the workers prior to site entrance, during working hours and after site works to identify persons showing signs of being unwell with the COVID-19 symptoms

8 WASHING FACILITY

- All worksites should have access to toilet and hand washing facility.
- Providing hand cleaning facilities at entrances and exits. This should be soap and water wherever possible or hand sanitiser if water is not available
- Washing facility with hot water, and soap at fire hydrants or other water sources to be used for frequent handwashing for all onsite employees
- All onsite workers must help to maintain and keep stations clean
- If a worker notices soap or towels are running low or out, immediately notify supervisors. Proactively supervisor should make sure shortage situation never occurs.
- Garbage bins will be placed next to the hand wash facility for discarding of used tissues/towels with regular removal and disposal facility (end of each day)

9 CLEANING PROCEDURES

Increase cleaning/disinfection visits to at least 2 times a day. Cleaning person(s) to be provided with gloves, gown and face mask for each cycle of cleaning.

Each worksite should have enhanced cleaning and disinfection procedures that are posted and shared including sheds, gates, equipment, vehicles, etc. and shall be posted at all entry points to the sites, and throughout the project site. These include common areas and high touch points like

- Taps and washing facilities
- Toilet flush and seats
- Door handles and push plates
- Handrails on staircases and corridors

- Lift and hoist controls
- Machinery and equipment controls
- Food preparation and eating surfaces
- Telephone equipment / mobiles
- Keyboards, photocopiers and other office equipment

Re-usable PPE should be thoroughly cleaned after use and not shared between workers

10 LABOUR CAMP

Contractor shall follow a zero-tolerance policy on wearing of masks.

Masks (homemade can be thought of) to be provided to all the persons/labourers for use at the camp site as well as at the worksite. Increase cleaning/disinfection visits to at least 2 times a day. Cleaning person(s) to be provided with disposable gloves, gown and face mask for each cycle of cleaning.

10.1 Toilet Facility

- Restrict the number of people using toilet facility at any one time e.g. appoint one welfare attendant among the labours.
- Wash hands before and after using the facilities
- Enhance the cleaning regimes for toilet facilities particularly door handles, locks and the toilet flush
- Portable toilets should be avoided wherever possible, but where in use these should be cleaned and emptied more frequently
- Provide suitable and sufficient rubbish bins for hand towels with regular removal and disposal.

10.2 Eating/snacks Arrangements

- With eateries having been closed (restricted) across Andhra Pradesh, providing permanent (till society is safe from COVID-19) on-camp/off-camp cook/helpers can be implemented. Make sure that the “Guidelines for food handling, preparation and distribution during COVID-19” and its regular updates are being followed.
- Whilst there is a requirement for construction camps to provide a means of heating food and making hot water, these are exceptional circumstances and where it is not possible to introduce a means of keeping equipment clean between use, etc. must be removed from use.

- Contractor to arrange all daily need items and grocery at site itself and no worker is allowed to go to shops for daily need items.
- Dedicated eating areas should be identified on camp to reduce food waste and contamination
- Break times should be staggered to reduce congestion and contact at all times
- Hand cleaning facilities or hand sanitiser should be available at the entrance of any room where people eat and should be used by workers when entering and leaving the area
- Workers should sit 2 metres “6 feet” apart from each other whilst eating and avoid all contact
- Where catering is provided on camp, it should provide pre-prepared and wrapped food only
 - o Payments should be taken by contactless options wherever possible
 - o Crockery, eating utensils, cups etc. should be avoided wherever possible
- Drinking water should be provided with enhanced cleaning measures of the tap mechanism introduced
- Tables should be cleaned between each use
- All rubbish should be put straight in the bin and not left for someone else to clear up; only covered pedal operated bins should be used and the bins should be cleared and cleaned regularly, with strict adherence to safety protocols for disposal and hygiene maintenance (including proper PPE’s such as gloves, mask and apron worn by the waste handler/cleaner and disposal at a designated place);
- All areas used for eating must be thoroughly cleaned at the end of each break and shift, including chairs, door handles, etc.

10.3 Changing Facilities, Showers and Drying Areas

- Introduce staggered start and finish times to reduce congestion and contact at all times
- Introduce enhanced cleaning of all facilities throughout the day and at the end of each day
- Consider increasing the number or size of facilities available on camp if possible
- Based on the size of each facility, determine how many people can use it at any one time to maintain a distance of two metres

- Provide suitable and sufficient garbage bins in these areas with regular removal and disposal.
- Visitor log should be strictly maintained that the labour camp.

COVID-19 officer will ensure compliance with prevention issues at the labour camp(s).

11 UPDATES ON COVID-19

The Contractor shall be in touch with the Department of Health & Family Welfare and Labour Department to identify any potential worksite exposures relating to COVID-19, including:

- Strictly follow the guidelines issues by Ministry of health and OSHA
- Other workers, vendors, inspectors, or visitors to the worksite with close contact to the individual
- Labour Camps / Work areas such as designated workstations or rooms/sheds
- Work tools and equipment
- Common areas such as break rooms, tables and sanitary facilities

Also refer the following websites from time to time for regular updates.

<https://www.mohfw.gov.in/>

<http://hmfw.ap.gov.in/>

This document can be updated from time to time based on the advisories or directions of the Government.

12 TRAINING

- RPMU/PIU to ensure all workers get training on above requirements before start of any construction activity
- During construction period frequent visual and verbal reminders to workers can improve compliance with hand hygiene practices and thus reduce rates of infection. Handwashing posters should also be displayed at work site and labour camps

13 EMERGENCY CONTACT

- Provide emergency contact number(s) at work site and labour camp for reporting COVID-19 symptoms

Ensure all staff and personal use the Aarogya Setu App, recommended by GOI for tracking COVID-19 patients.

Appendix 14: APIIC Note on CETP under Tranche-2



**Andhra Pradesh
Industrial Infrastructure Corporation Ltd.,**
(Govt. of Andhra Pradesh Undertaking)

Note on CETP under Tranche -II

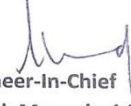
Under the "National Industrial Corridor Development Programme" Government of Andhra Pradesh has taken up the Visakhapatnam-Chennai Industrial Corridor Development Program (VCIC-DP), with financial assistance from Asian Development bank (ADB) to develop State of the Art Infrastructure in three Industrial Clusters i.e. Nakkapalli and Rambilli in Visakhapatnam and Srikalahasthi – Yerpedu in Chittoor Node.

The Andhra Pradesh Industrial Infrastructure Corporation Limited (APIIC) is one of the Project Implementing Units. Under Tranche-II APIIC is implementing the projects including Infrastructure development sub projects (i.e. APIIC 06A, 08A, 09A and AMTZ-I) and 4 CETP sub-projects (i.e. APIIC 06B, 08B, 09B, 10).

The internal Infrastructure development sub-projects, i.e., APIIC/06A, APIIC/08A and APIIC/09A are undergoing tendering process in consultation with ADB and are essential for development of industrial clusters which can be monetized immediately. Further, the CETPs shall be required during the occupancy phase of these industrial clusters.

In light of above, it is proposed that, the CETPs will be taken up in Design Built Operate Finance and Transfer mode (DBFOT) post completion of the internal industrial infrastructure. It will be ensured that these CETP will be kept ready before the Industrial unit's starts their operations. Otherwise, Individual industries are advised to set up their own arrangements as per PCB Norms till CETP gets operated. Further, it is ensured that CETP's design will be in line with statutory approvals from MoEF & CC, Pollution Control Board, and other regulatory authorities.

Regarding maintenance of Green belt initially it will be maintained by raw water. Once CETP is commissioned, the recycle water shall be used within the industrial park.


Engineer-In-Chief
APIIC Ltd, Mangalagiri.

Regd. Office :
PARISRAMA BHAVAN, 6th floor,
i-9-58/B, Fateh Maidan Road,
Masheerbagh, Hyderabad-500 004.

Corporate Office :
APIIC TOWERS, IT Park,
Mangalagiri, Guntur Dist.,
Andhra Pradesh-522503.

0863-2381850
www.apiic.in

CIN No. U99999TG1973SGC0016