GOVERNMENT OF ANDHRA PRADESH

Andhra Pradesh Urban Finance Infra Structure Development Corporation Limited

Andhra Pradesh Urban Water Supply and Septage Management Improvement Project

The Asian Infrastructure Investment Bank assisted

Environmental & Social Assessment and Preparation of Environmental & Social Management Planning Framework

Final Report (Version 2)

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List of Acronyms

AAQM	Ambient Air Quality Monitoring
AE	Assistant Engineer
AEE	Assistant Executive Engineer
AIDS	Acquired Immune Deficiency Syndrome
AIIB	Asian Infrastructure Investment Bank
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
APUFIDC	AP Urban Finance and Infrastructure Development Corporation
APUWSSMIP	AP Urban Water Supply and Septage Management Improvement Project
ARAP	Abbreviated Resettlement Action Plan
BCM	Billion Cubic Meters
CBO	Community Based Organisation
CBSC	Central Board of Secondary Education
CE	Chief Engineer
CIIP	Critical Infrastructure Investment Plan
CMU	City Management Unit
CPCB	Central Pollution Control Board
CPCB	Central Pollution Control Board
CPEEHO	Central Public Health and Environmental Engineering Organisation
CPF	Community Participation Framework
CRZ	Coastal Regulation Zone
CSP	City Sanitation Policy
DFO	District Forest Officer
DG	Diesel Generator
DPR	Detailed Project Report
EIA	Environmental Impact Assessment
ELSR	Elevated Level Service Reservoir
EMP	Environmental Management Plan
EPA	Environment Protection Act
ESD	Environmental and Social Data
ESF	Environmental and Social Framework
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMPF	Environmental and Social Management Planning Framework
ESP	Environmental and Social Policy
ESS	Environment and Social Standards
FGD	Focus Group Discussion
FSSM	National Policy on Fecal Sludge and Septage Management (FSSM), 2017
GoAP	Government of Andhra Pradesh
GoI	Government of India
GRC	Grievance Redressal Committee
GRM	Grievance Redressal Mechanism
GVMC	Greater Vishakhapatnam Municipal Corporation
IAA	Impact Assessment Agency
IEC	Information, Education and Communication
IEE	Initial Environmental Examination or Evaluation

IEESA	Independent External Environmental and Social Audit
IMD	Indian Meteorological Department
Km	Kilometer
LA	Land Acquisition
LPCD	liters per capita per day
MCW	Mother and Child
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MIS	Management Information System
MLA	Member of Legislative Assembly
MLD	Million Litres per Day
MoEF&CC	Ministry of Environment Forest and Climate Change
MOHFW	Ministry for Health and Family welfare
MoUD	Ministry of Urban Development
MP	Member of Parliament
MSL	Mean Sea Level
NAPCC	National Action Plan for Climate Change
NGO	Non-Governmental Organisation
NOC	No Objection Certificate
NPF	Notified Protected Forest
NRW	Non Revenue Water
NUSP	National Urban Sanitation Policy
O&M	Operation and maintenance
ODR	Other District Road
OM	Operational Manual
PCB	Pollution Control Board
PCC	Pollution Control Committee
PHMED	Public Health and Municipal Engineering Department
PMC	project Management Consultant
PMU	Project Management Unit
PRED	Panchayat Raj Engineering Department
R&R	Resettlement and Rehabilitation
RAP	Resettlement Action Plan
RCC	Reinforced Cement Concrete
RPF	Resettlement Planning Framework
RTFCTLARR Act	Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013
SAPCC	State Action Plan for Climate Change
SC	Schedule Caste
SCZMA	State Coastal Zone Management Authority
SDGs	Sustainable Development Goals
SE	Superintending Engineer
SEAC	State Expert Appraisal Committee
SEAC	State Environmental Clearance Authority
SEIAA	State Environment Impact Assessment Authority
SGDP	State Gross Domestic Product
SHG	Self Help Group
SIA	Social Impact Assessment
SMF	Social Management Framework
SMP	Social Management Plan
SPCB	State Pollution Control Board
SSC	Secondary School Certificate

ST	Schedule Tribe
STD	Sexually Transmitted Diseases
STP	Sewerage Treatment Plant
TMC	Thousand Million Cubic Feet
TOR	Terms of Reference
TPMP	Tribal Peoples Management Plan
TPP	Tribal People Plan
TPPF	Tribal Peoples Planning Framework
UFW	Unaccounted for Water
ULB	Urban Local Body
UWSS	Urban Water Supply and Sanitation Services
WTP	Water Treatment Plant

1 Introduction

1.1 The State of Andhra Pradesh

With the enactment of the Andhra Pradesh Reorganization Act 2014, the state of Andhra Pradesh was bifurcated into Andhra Pradesh and Telangana. Andhra Pradesh is one of the 29 states of India. Situated in the south-east of the country, it is the eighth-largest state in India, covering an area of 162,970 sq. km. As per 2011 census, it is the tenth most populous state, with 49,386,799 inhabitants. The state of Andhra Pradesh comprises 13 districts.

The urban population is spread across 110 Urban Local Bodies (ULBs) consisting of 14 Corporations, 71 Municipalities and 25 Nagar Panchayats. The net increase of urban population between 2001 and 2011 is approximately 5.4 percent. Vijayawada and Vishakhapatnam are major cities in the state. The urban areas contribute close to 65 percent of the economic growth in the state. The secondary sector contributed 24.72 percent to the State Gross Domestic Product (SGDP) while primary sector contributed about 21.51 percent in 2010-11.

The total population constitutes 70.4% of rural population with 34,776,389 inhabitants and 29.6% of urban population with 14,610,410 inhabitants. Children in the age group of 0–6 years are 5,222,384, constituting 10.6% of the total population.

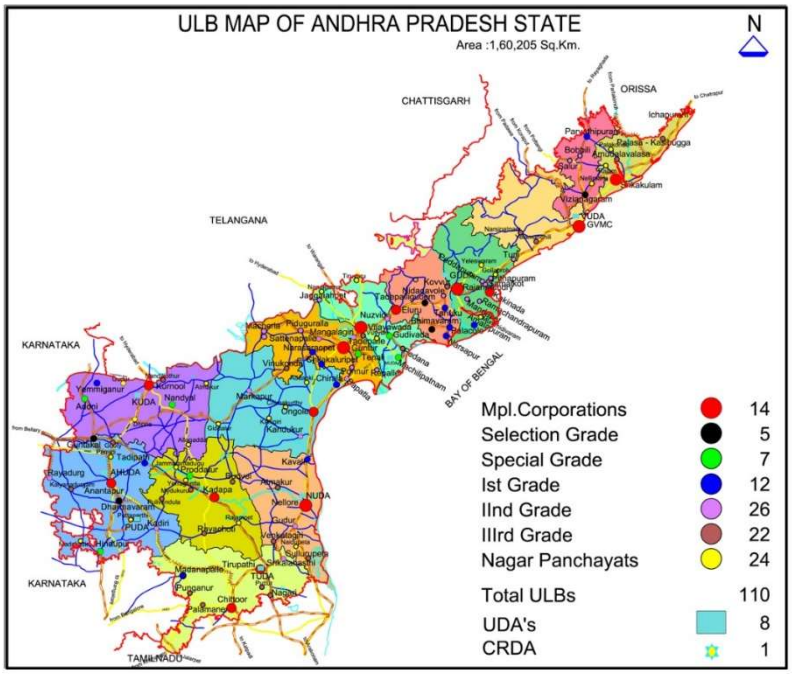


Figure 1: ULB Map of AP

1.2 Background

Andhra Pradesh is urbanizing rapidly however, development of basic infrastructure has not been able to match with the urban growth. Water supply, waste water collection and treatment, drainage, solid waste and other basic infrastructure are largely inadequate in urban areas of the state and are not capable to respond to the population and economic growth. Particularly, water supply and sanitation are characterized by low coverage, intermittent services, poor standards and quality.

In the state of Andhra Pradesh, around 71 percent of urban households have access to improved water supply[1]. The goal of the GoAP is to achieve universal coverage in water supply, septage management and sewerage, in line with the national priorities by rolling out infrastructure in urban areas.

The Government of Andhra Pradesh has also planned to provide continuous water supply of 135 liters per capita per day (lpcd) corresponding to the national service level benchmarks, as compared to the current intermittent water supply of up to 87 lpcd.

1.3 Vision 2029

As per the Vision 2029 of the Government of AP:

"The state of Andhra Pradesh is committed provide access to quality drinking water by conservation and sustainable management of its water resources. Efficiency enhancement, conserving groundwater resources, and increasing irrigation potential are the chief goals for this sector. In consonance with the Sustainable Development Goals (SDGs) the state also aims to drought proof and provide full coverage with safe drinking water for all the people by 2019. By 2029, the state aims to attain optimum treatment, reuse, and recycling of wastewater according to national standards, in order to balance competing water demands across sectors to meet its development priorities."

The nation-wide program, named as Atal Mission for Rejuvenation and Urban Transformation (AMRUT) was launched by the Government of India in 2015 aiming to provide basic services in ULBs with a population of more than 100,000 inhabitants. The program provides grant financing for investments in water supply, sewerage facilities, septage management, storm water drains, public transport and parks in 500 cities for the period 2015 to 2020. The program includes investments in hard infrastructure, capacity building and reforms in 11 areas, such as urban planning, improvement in levy and collection of user charges, and energy and water audits. To further address the issue of sanitation, the Government of India has launched several other initiatives such as the Swach Bharat Abhiyan Mission which aims to clean up cities, urban and rural areas and to end open defecation by 2019.

Since the AMRUT program does not provide coverage for Urban Local Bodies (ULBs) with a population of less than 100,000 inhabitants, leaving a significant share of the population uncovered, the GoAP has decided to launch the **Andhra Pradesh Urban Water Supply & Septage Management Improvement project (APUWSSMIP; project)** to cover the remaining inhabitants in all the 50 ULBs. The project will supplement with other programs of the Government of India and programs of the Government of Andhra Pradesh such as the Critical Infrastructure Investment Plan (CIIP) to meet the urban infrastructure gap in Andhra Pradesh.

[1] https://www.aiib.org/en/projects/proposed/2018/_download/india/urban-water.pdf and apvision.ap.gov.in/apstatus-water.php, Water Resources-Institutions and Management

1.4 Andhra Pradesh Urban Water Supply & Septage Management Improvement project (APUWSSMIP)

The proposed project will include investments in water supply infrastructure which comprises of;

(i) construction of intakes at raw water source & pumping station,
(ii) raw water transmission mains,
(iii) water treatment plants,
(iv) clear water transmission mains,
(v) treated water storages, and
(vi) distribution networks and household service connections in 50 ULBs in Andhra Pradesh.

The project will also include investments in septage management and septage treatment plants, on a pilot basis. This will be supplemented by GoI and GoAP funds for improvement of the drainage network and sanitation services in the project ULBs. In few project ULBs, the partial existing infrastructure will be rehabilitated and augmented to be used with the newly created infrastructure. To maximize economic benefits, enhance public health security, and ensure a safe environment, it is essential that the investments in water supply and sanitation services be carried out as an integrated approach and should be implemented simultaneously. It was decided that appropriate technologies will be piloted in 5 ULBs (Allagadda, Nandikotkur, Kanigiri, Kalyanadurgam and Sullurpeta) and thereafter implemented in all project ULBs to address wastewater & sewerage treatments. CIIF funds will be used for scaled implementation of the septage management component.

The project will be implemented in two phases; Phase 1 and Phase 2. Phase 1 could cover 21 ULBs. Phase 2 will comprise of the remaining 29 ULBs. Out of 21 ULBs selected in the 1st Phase, 14 ULBs are from the drought prone region of Rayalaseema consisting of Chittoor, Kadapa, Anantapur and Kurnool Districts and remaining 7 ULBs are from drought prone region of Prakasam and Nellore Districts. These ULBs are mostly depending on ground water. The ground water in these regions is depleting due to less rain fall. Hence, the selection of the ULBs is based on need and operational convenience.

1.5 Objectives

The project objective is to improve water supply and sanitation service levels, and strengthen sustainable service delivery in the targeted urban areas in the State of Andhra Pradesh, India. The present project envisages provision of 135 lpcd potable water to 2.4 million population in 50 ULBs of the state.

1.6 Project Components

- Source augmentation in order to meet the 135 lpcd demand in the base year (2017), prospective year (2032) and ultimate year (2047) of planning
- Laying of raw water main from the source to the treatment plant
- Water treatment plant construction or augmentation as required

- Construction of clear water reservoirs
- Laying of gravity / pumping main from clear water reservoir to various service reservoirs
- Construction of service reservoirs
- Laying or extending of service network
- House service connections
- Retrofitting of existing infrastructure
- Waste water and sewerage treatment plants as pilot basis in 5 ULBs (Allagadda, Nandikotkur, Kanigiri, Kalyanadurgam and Sullurpeta)

The Project cost is estimated to be USD 940 million. The financing sources are as follows:

Table 1-1: Project Cost Estimate

Agency	Amount (million USD)
AIIB Loan	400
GoAP	540
Total	**940**

Source: PSI, AIIB

The project will be implemented by The Public Health & Municipal Engineering Department, GoAP and Andhra Pradesh Urban Finance and Infrastructure Development Corporation (APUFIDC), GoAP shall be the nodal agency for the project. Proposed project implementation period is January 2019 to December 2023.

1.7 Environmental and Social

The project has been assigned **Category "A"** in accordance with the Asian Infrastructure Investment Bank's (AIIB) Environmental and Social Policy (ESP) and Environmental and Social Standards (ESS). Based on preliminary assessments, all three ESSs, i.e., ESS 1 (Environmental and Social Assessment and Management), ESS 2 (Involuntary Resettlement) and ESS 3 (Indigenous Peoples) are applicable for the project. As required by the Bank's ESP for Category 'A' projects, an Environmental and Social Management Framework (ESMF) is being developed for the entire project comprising of 50 ULBs.

This ESMF includes;

- a generic Environmental and Social Management Plan (ESMP) and provides guidance on preparation of Environmental and Social Impact Assessments (ESIA) for project ULBs and develop ULB specific ESMPs.
- All environmental and social risks and their mitigation measures are identified and assessed in the ESMF.
- A Resettlement Policy Framework (RPF) has been prepared to provide guidance on addressing issues of land acquisition, and physical and economic displacements, either of temporary or of permanent nature.
- the ESMF also includes a Tribal Peoples Planning Framework (TPPF) and a Tribal Peoples Management Plan (TPMP) is prepared as standalone documents

1.8 Need for ESMF

As there are multiple sub-projects and the location of the sub-project components are yet to be firmed up, an **Environmental and Social Management Planning Framework (ESMPF)** is to be prepared, consistent with the ESP. The purpose of the ESMPF is to ensure that the activities will be assessed and implemented in conformity with the ESP and ESSs. The ESMPF sets out the policies and procedures to assess and address:

a) environmental and social risks and impacts of the activities;
b) Involuntary Resettlement and land acquisition that are unlikely to arise from the activities, however there may be instances when encroached land may be required to be cleared for the purpose of project implementation; and
c) Impacts on Tribal Peoples that are likely to arise from the activities.

Therefore, the ESMPF will be complemented by a **Resettlement Planning Framework (RPF)** to address clearing of encroachments and a **Tribal Peoples Planning Framework (TPPF)**. The policies and procedures also cover working conditions and community health and safety aspects described in ESS 1. The Project will also include provisions for use of a **Grievance Redress Mechanism (GRM)**.

These ESMPF, and TPPF are to be prepared, consulted upon and disclosed prior to approval of the AIIB's financing of the Project. Consultations should include local government, civil society organizations, nongovernmental organizations, Tribal Peoples representatives and the public. During Project implementation, the ESMPF, and TPPF will provide guidance for preparation of Environmental and Social Management Plans (ESMPs); removal of encroachments; and/or Tribal Peoples Plans (TPPs) for the activities, as appropriate.

1.9 Execution of ESMPF

The ESMPF is an overarching tool developed at the macro level to provide guidance for construction of urban water supply subproject at the ULB level. The ESMPF will provide environmental and social safeguards tools that will:

- help to assess local impacts in a comprehensive manner;
- identify appropriate mitigation measures to address the impacts;
- location specific guidance to address the environmental and social dynamics;

The tools have been prepared in line with the environmental and social rules and regulations adopted by the Government of India (GoI), Government of Andhra Pradesh and the AIIB 's Environmental and Social Framework (ESF). It also provides a generic ESMP based on rapid assessment of environmental and social conditions relevant to urban water supply project. This will help in the management of environmental and social programs in a comprehensive, systematic and planned manner with regular documentation.

1.9.1 Applicability with respect to AIIB's Environmental and Social Framework

- **ESS 1 (Environmental and Social Assessment and Management)** will be applicable to assess the localised social and environmental impacts of the project.
- **ESS 2 (Involuntary Resettlement)** may be applicable; as such there is no Land Acquisition (LA) and displacement of people envisaged at this stage but during DPR Preparation or implementation stage if any Land acquisition requirements are envisaged RAP/ ARAP shall be prepared for the sub-project depending as required and as per the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (RTFCTLARR Act).
- **ESS 3 (Indigenous Peoples)** will be applicable since the project will be involved in districts having sizable Schedule Tribe (ST) population

This ESMF is a live and dynamic document and needs to be updated and revised as necessary to incorporate the changes based on the status of the prevailing laws, as well as revisions that might arise due to APUWSSMIP project development process. The ESMPF shall be reviewed by the staff annually and updated as required. Versioning of the document and preparation of update / change datasheet shall be helpful in order to understand the revisions on annual basis. The recommended approach for the end users of the ESMPF is as follows:

- Assess localized impacts and determine mitigation measures based on the guidance provided in the ESMPF.
- Follow the Environmental and Social guidelines during implementation.
- Follow safety plan during construction.
- Ensure effective community participation to execute project implementation

1.10 Structure of the Document

Table 1-2: Structure of the Report

Chapter No.	Title	Coverage
1.	Introduction	▪ Project background, ▪ brief description and objectives of the project, ▪ APUWSSMIP and its components and ▪ Need and purpose of the ESMPF document.
2.	Legal, Policy and Regulatory Framework	▪ Relevant environmental laws, policies and regulations of GoI and GoAP applicable for APUWSSMIP. ▪ Applicable AIIB's ESF which need to be adopted during the project planning and implementation. ▪ Statutory Compliances required during implementation of project activities ▪ Relevant Drinking Water Policies in India ▪ Relevant Drinking Programs in India
3.	Environmental Baseline	Details of the environmental baseline information.
4.	Baseline - Primary Survey	The primary survey results conducted for sample project ULBs
5.	Environmental and Social Impacts	▪ Potential Benefits of the Project ▪ Potential Adverse Environmental Impacts ▪ Potential Adverse Social Impacts and different scenarios for acquiring land ▪ Details of climate change Consideration - Likely Impacts and Adaptation/ Mitigation Actions

Chapter No.	Title	Coverage
6.	Environment and Social Management Planning Framework	▪ Procedures to conduct EIA ▪ Procedures to conduct SIA
7.	Environment Impact Mitigation Plan	presents the: ▪ Generic Environmental and Social Management Plan
8.	Grievance Redress Mechanism	The Grievance Redress Mechanism adopted for the project and for project beneficiaries and affected people.
9.	Monitoring and Evaluation	To achieve objectives of this ESMPF and to ensure the safeguards are implemented in a proper manner a detailed supervision, monitoring and evaluation of the implementation of the ESMP is required. The process of monitoring is detailed in this chapter
10.	Institutional Arrangement	Institutional arrangement proposed for implementing the ESMPF under this project.
11.	Training and Capacity Building	Building and strengthen the capability of APUMWSSMIP staff, participating departments, and other partners in sub-project implementation.
12.	Gender and Vulnerable Peoples Action Plan	Guidelines to mitigate any potentially adverse gender-specific impacts due to the Project and to enhance the design of the Project to promote equality of opportunity and empowerment, with respect to provision of services and employment.
13.	Citizen Engagement Strategy, Consultation and Disclosure	Strategy to engage citizens in design, planning, implementation and monitoring the project implementation. This chapter details the stakeholders and an engagement plan. Various level of disclosure of ESMPF and all Safeguards related documents and mitigation plans is also discussed
14.	ESMPF Budget	Tentative administrative budget for ESMPF This does not include cost of mitigating environmental and social impacts of the respective sub-projects' budgets

2 Legal, Policy and Regulatory Framework

2.1 Introduction

This chapter deals with the laws, regulations and policies, of Government of India, Government of Andhra Pradesh and Asian Infrastructure Investment Bank (AIIB) related to environment and social issues. Only the laws, regulations and policies relevant to the project are discussed here. This section needs to be updated as when new laws, regulations and policies are made and enforced or the existing ones are revised.

2.2 Water - a State Subject

Under the Constitution of India, water is a State subject, with the legislative jurisdiction of Central Government largely limited to inter-state river waters. While the intervention of Government of India in water regulation is thus limited, the importance of national regulation in water has been recognized in certain areas. With regard to water pollution, Parliament adopted the Water Act in 1974, which seeks to prevent and control water pollution and maintain/ restore the wholesomeness of water.

The Draft National Water Policy 2012 recently articulated the need for a National Framework Water Law. While recognizing that States indeed have the right to frame suitable policies, laws and regulations on water under the Constitution, it nevertheless argues that an over-arching national legal framework of general principles will pave the way for essential legislation on water governance in every State and effective devolution of authority to lower tiers of government.

Although amendments to the Constitution of India in 1992 regarding Municipalities introduced water and sanitation as functions to be devolved by State Governments to Urban Local Bodies, this transition is incomplete, and implementation is still at work-in-progress stage. In most states, the State Governments continue to hold responsibility over urban water supply and sanitation through state-level departments and parastatal agencies.

Even in states, where the urban water and sanitation function has technically been transferred to ULBs, ULBs are often inadequately equipped in terms of financial and organizational capacity. They tend to depend on State-level departments and agencies for financing and execution of capital projects and their role is often limited to handling operations and maintenance. As a result, accountability for urban water and sanitation continues to be diffused across multiple tiers of Government. A renewed focus on implementation of several policy and institutional reforms is therefore a critical element in transforming water sector.

2.2.1 National Water Policy 2012

With regards to urban water supply and sanitation, the policy emphasizes on;

- Need to remove the large disparity between stipulations for water supply in urban areas and in rural areas.

- Water supply should preferably be from surface water in conjunction with groundwater and rainwater. Where alternate supplies are available, a source with better reliability and quality needs to be assigned to domestic water supply.
- Reuse of urban water effluents from kitchens and bathrooms, after primary treatment, in flush toilets, ensuring no human contact.
- Collect and publish water accounts and water audit reports indicating leakages and pilferages, which should be reduced taking into due consideration social issues.
- Rainwater harvesting and de-salinization, wherever techno-economically feasible, to increase availability of utilizable water in urban and industrial areas
- Integration and simultaneous execution of water supply and sewage treatment schemes. Water supply bills should include sewerage charges.
- Industries in water short regions may be allowed to either withdraw only the make-up water or should have an obligation to return treated effluent to a specified standard back to the hydrologic system.
- Subsidizing and incentivizing recovery of industrial pollutants and recycling/ reuse, which are otherwise capital intensive.

2.2.2 AP State Water Policy 2008

The objective of the Andhra Pradesh State Water Policy, is to ensure the comprehensive multi-sectoral planning, development and management of the State's water resources, and effective, efficient, equitable and sustainable service delivery for various water uses. The policy covers aspects such as:

- Ensuring water security to entire population by ensuring adequate clean, hygienic, accessible, affordable and safe water for all
- Improving water management and efficiency by integrating and coordinating efforts by all concerned institutions/ organizations in developing a policy framework for planning water resources, augmenting them and putting them to productive use.
- Effective participation of users in development and management of the state's water resources
- Promotion of sustainable use of groundwater
- Maintain and sustain ecological balance by conserving and protecting water bodies and wetlands, through regulation and enforcement of standards for water infrastructure, usage and disposal.

2.2.3 National Urban Sanitation Policy

In 2008, Ministry of Urban Development, Government of India (MoUD) launched the National Urban Sanitation Policy (NUSP) with an aspirational vision for Indian cities – 'All Indian cities and towns become totally sanitized, healthy and livable and ensure and sustain good public health and environmental outcomes for all their citizens with a special focus on hygienic and affordable sanitation facilities for the urban poor and women'. To support implementation of this vision, the NUSP envisaged formulation of City Sanitation Plan (CSP) at a city level as a comprehensive document that would detail short, medium and long-term plans for governance, technical, financial, capacity

building, awareness and pro-poor actions to ensure 100% access to safe sanitation. As a follow up to the NUSP, the Government of India initiated a periodic rating of cities by independent agencies on a range of sanitation indicators.

2.2.4 Service Level Benchmarking

The Ministry of Urban Development (MoUD), Government of India has launched the Service Level Benchmarking (SLB) initiative covering water, sanitation, solid waste management and storm water drainage. A Handbook on Service Level Benchmarking has been released by MoUD to identify a minimum set of standard performance parameters, to define a common minimum framework for monitoring and reporting and to set out guidelines on how to operationalize this framework in a phased manner. The SLB framework is outlined in the Handbook to facilitate a planned approach to undertake improvements in performance and service delivery.

2.2.5 MoUD Advisory Note on Improving Water Supply and Sanitation Services, 2012

MoUD has issued an advisory note on UWSS with the intention of providing guidance to states and cities with respect to policies and governance structure to ensure service delivery. It begins by highlighting the general service principles supported by the MoUD: state policies for UWSS, governance structures aligned to service delivery, asset ownership and responsibilities with ULB, Unbundling or Formation of Regional Entities for specific and appropriate functions like bulk supply or waste water treatment, state level regulator, move towards financial sustainability, restructuring of tariffs and building professional sector with alignment between state level organization and local bodies. The key issues identified in the note are:

- Clarifying the Mandates of Water Supply and Sanitation Service Providers
- Improving the Governance of Water Supply and Sanitation Service Providers
- Financing Water Supply and Sanitation Operations and Infrastructure Development
- Regulating the Urban Water Supply and Sanitation Service
- Building Capacity, Developing Procedures and Professionalizing Actors of the Water Supply and Sanitation Sector.
- Developing Procedures for Community Participation

It recommends that states develop a detail sector program for next 10 years and develop a WSS business plan or service improvement plan. The plan needs to contain WSS Policies and Institutional Development Program, WSS Regulation Program, WSS Infrastructure Development Program and WSS Capacity Building Program.

2.2.6 Andhra Pradesh State Sanitation Strategy

The overall vision of Andhra Pradesh State Sanitation Strategy is to achieve a “Swachha Andhra” ensuring healthy and clean cities providing access to sanitation infrastructure to all citizens. The specific goals of strategy are to;

- Ensure 100 percent hygienically safe and sanitary treatment and disposal
- Achieving Open Defecation Free Cities
- Improved institutional governance and enhanced human resource capacities for city-wide sanitation
- Enhanced awareness and sustained behavioral change
- Technological efficiency and appropriateness

2.2.7 Solid Waste Management Rules, 2016

The state of Andhra Pradesh has formulated a strategy for solid waste management. The strategy states that all urban local bodies will need to have capacities and preparedness to undertake source segregation of waste, door to door collection and transportation, to set up processing and treatment systems and dispose only the inerts in scientific landfills.

2.2.8 National Policy on Fecal Sludge and Septage Management (FSSM), 2017

The key objective of the urban FSSM Policy is to set the context, priorities, and direction for, and to facilitate, nationwide implementation of FSSM services in all ULBs such that safe and sustainable sanitation becomes a reality for all in each and every household, street, town and city. More specifically, the Policy will:

- ensure that all benefits of wide access to safe sanitation accrue to all citizens across the sanitation value chain with containment, extraction, transportation, treatment, and disposal / re-use of all faecal sludge, septage and other liquid waste and their by-products and end-products.
- Suggest and identify ways and means, including the methods and resources, towards creation of an enabling environment for realizing safe and sustainable FSSM
- Define the roles and responsibilities of various government entities and agencies, and of other key stakeholders such as the private sector, civil society organizations and citizens for effective implementation of FSSM services throughout the country.
- Enable and support synergies among relevant Central Government programs such as SBM, AMRUT and the Smart Cities Mission to realize safe and sustainable sanitation for all at the earliest, possibly by the year 2019.
- While not compromising the eventual compliance to the strict environmental discharge standards already set, recognizing the constraints in achieving these standards, adopt an appropriate, affordable and incremental approach towards achieving these standards.
- Mitigate gender-based sanitation insecurity directly related to FSSM, reducing the experience of health burdens, structural violence, and promote involvement of both genders in the planning for and design of sanitation infrastructure.

2.3 Environmental Laws, Policies and Regulations

Table 2-1: Environmental Laws and their Applicability

Policy/Act/Rule	Year	Purpose	Responsible Institution	Applicability (Yes/No)
Environment (Protection) Act.	1986	To protect and improve the overall environment. Under this Act, the central government is empowered to take measures necessary to ▪ Protect and improve the quality of the environment by setting standards for emissions and discharges; ▪ Regulating the location of industries; ▪ management of hazardous wastes, and ▪ Protection of public health and welfare. ▪ Protection of environment in the country. ▪ It includes the power to direct the closure, prohibition or regulation of any industry, operation or process by the government	MoEF	Yes
Notification on Environment Impact Assessment of Development projects (and amendments) (referred to as the Notification on Environmental Clearance)	2006 2009 2011	To provide environmental clearance to new development activities following environmental impact assessment. ▪ All projects listed under Schedule-I of the Notification require environmental clearance from the MoEF.	MoEF	No
Wildlife Protection Act	1972	This Act provides for ▪ Protection to listed species of Flora and Fauna in the declared network of ecologically important protected areas such as wild life sanctuaries and national parks. ▪ to establish a number of national Parks and Sanctuaries to protect and conserve the flora and fauna of the state	MoEF	Yes
The Wildlife (Protection) Act Amendment	1991			
Coastal Regulation Zone (CRZ) notification	2011	To provide for protection of the fragile coastal belt, through development controls and regulations	SCZMA	Yes
National Forest Policy	1988	▪ Protect and enhance the yields of non-timber forest products in order to generate employment and income for forest and village communities	Forest Department, GoAP MoEF	Yes
Water (Prevention and Control of Pollution) Act (and subsequent amendments)	1974	This Act ▪ Prohibits the discharge of pollutants into water bodies beyond a given standard ▪ Lays down penalties for non - compliance. ▪ Includes the maintenance or restoring the wholesomeness of the water.	SPCB CPCB	Yes, as per the EPA, 1986
Air (Prevention and Control of Pollution) Act (and subsequent amendments)	1981	To provide for the ▪ Prevention, control and abatement of air pollution, ▪ Establishment of Boards to carry out these purposes.	SPCB CPCB	Yes, as per the EPA, 1986

Policy/Act/Rule	Year	Purpose	Responsible Institution	Applicability (Yes/No)
Noise Pollution (Regulation and Control) rules 2000	2001	Noise pollution regulation and controls	SPCB CPCB	Yes, as per the EPA, 1986
Central Motor Vehicle Act	1988	To control vehicular air and noise pollution. To regulate development of the transport sector, check and control vehicular air and noise pollution.	Transportation Department, GoAP	Yes, for all the vehicles used for construction purposes
Central Motor Vehicle Rules	1989			
The Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act	2010	▪ The Ancient Monuments and Archaeological sites should be protected from any developmental activity. ▪ The area within the radial of 100 m and 300m from the Protected Property are designated as protected area and Controlled Area respectively. ▪ No development activity (including building, mining, excavating, blasting etc.,) is permitted in the Protected Area ▪ Developmental activities likely to damage the protected property are not permitted in the Controlled Area without prior permission	Department of Archaeology, GoAP Archaeological Survey of India. National Monuments authority	Yes, If there are ASI identified sites/ chance find along the APUWSSMIP network

2.4 AIIB Safeguard Policy

In addition to the national and state policies, acts and rules, the AIIB policy on environmental and social safeguards need to be adhered to in the present assignment. AIIB recognizes that environmental and social sustainability is a fundamental aspect of achieving development outcomes consistent with its mandate to support infrastructure development and interconnectivity. The Environmental and Social Framework of AIIB (2016), includes an Environmental and Social Policy and Environmental and Social Standards. The Environmental and Social Policy specifies that AIIB conduct environmental and social due diligence as an integral element of its appraisal of the project, and in a manner that is:

- Appropriate to the nature and scale of the Project; and
- Proportional to the level of the Project 's potential environmental and social risks and impacts

Following Table 2-2 depicts the outcome of the comparison between the AIIB safeguard policy and the MoEF&CC's EIA notification adopted by the GoI and GoAP.

Table 2-2: Comparison of EIA notification and AIIB Policy

S. No.	Project Stage	AIIB ESF 2016	EIA notification adopted by the GoI and GoAP	Comments
1	Project Screening and Categorization	Analyze potential impacts of the project for ▪ Screening of each proposed project at the concept stage ▪ Projects categorized as A, B, C and FI.	As per the EIA notification dt 14th September 2016, ▪ project screening has to be conducted ▪ Categorize the project as Category 'A' and Category 'B' ▪ Category B is further categorized as B1 and B2	
2	Conduct Environmental and Social Assessment	▪ Client to undertake an Environmental and Social Assessment of potential physical, biological, socio-economic and cultural risks and impacts. ▪ The type of instrument and level of detail is determined on the basis of project screening and environmental and social categorization. ▪ Client to prepare Environmental and Social Management Plan (ESMP) as appropriate	▪ Environmental and Social Impact Assessment is to be conducted for both Category 'A' and Category 'B1' projects. ▪ The assessment shall quantify the anticipated impacts on physical, biological and social environment.	▪ As per the provisions made under the ESMF, the project is categorized as category 'A' project. ▪ All sub-projects need to be screened and requirement of ESIA determined in planning stage itself.
3	Assessment of Alternatives	▪ Assessment of alternatives under ESS 1: Environmental and Social Assessment and Management. ▪ Examination to avoid or minimize environmental impacts.	In general, the ToR for conducting EIA suggested by the EAC for Category 'A' projects and State level EAC for Category 'B1' mandates the Assessment of Alternatives to avoid / minimize the anticipated Environmental and Social Impacts	
4	Prepare Environmental and Social Management Plan (ESMP)	▪ Development and implementation of an Environmental and Social Management Plan (ESMP)	▪ the EIA manual for Category 'A' and Category 'B' projects calls for preparation of the EMP's for the anticipated impacts. ▪ The EMP's shall include the monitoring plan with budgetary provisions	The APUWSSMI project shall have an ESMP provided with Budget provisions for effective implementation of the identified mitigation measures.
5	Public Consultation and Use of Project- Level Grievance Redress Mechanisms	▪ Client conducts meaningful consultation with Project-affected people to facilitate their informed participation in the consultations. ▪ Client continues consultation with stakeholders throughout the Project implementation as appropriate.	▪ Public consultation is mandatory for Category 'A' and 'B1' projects. But it has been exempted for category 'B2' projects.	▪ Public Consultation is a mandatory requirement for all projects. ▪ The provision for GRC is not mentioned in the EIA notification.

S. No.	Project Stage	AIIB ESF 2016	EIA notification adopted by the GoI and GoAP	Comments
		▪ Client to establish a Project-level Grievance Redress Mechanism.		▪ For the APUWSSMIP, the APUFIDC shall have a GRC to redress the grievance.
6	Information Disclosure	▪ Public disclosure of environmental and social documents, including ESMP, on AIIB website as per policy provisions. ▪ Regular disclosure of updated environmental and social information in the Project.	▪ The Executive Summary of the EIA has to be disclosed in the website (In MOEF&CC website for Category 'A' projects and State Pollution Control Board Website for Category 'B1' projects).	Both AIIB and APUFIDC will disclose the Project Information including safeguard documents

2.5 Social Policy and Regulatory Framework

This deals with various policies, acts, rules and regulations promulgated by the central government related to social issues and relevant to present project.

2.5.1 The Right to Fair Compensation and Transparency in Land Acquisition and Rehabilitation and Resettlement Act 2013

Land Acquisition (LA) Act of 1984 commonly used for acquisition of land for any public purpose has been annulled with the enactment of the RFCTLARAR Act 2013. The RFCTLARRA is mentioned here to provide a perspective on the changing legal context with regard to land acquisition in the country. The new Act emphasizes elaborate social assessment and resettlement planning even prior to issuance of the preliminary notification and proposes to provide a range of R&R benefits along with the compensation package. Some of the highlights are as follows:

- Offers compensations up to 4 times the market value in rural areas and 2 times the market value in urban areas.
- The Act applies retrospectively to cases where land acquisition award has not been made.
- LA in Scheduled Areas will require consent of the local general assembly (Gram Sabhas).
- No displacement or dispossession until full payment of compensation and RR benefits are made and alternative sites for the resettlement and rehabilitation have been prepared.
- Bill requires the consent of no less than 70 per cent and 80 per cent respectively (in both cases) of those whose land is sought to be acquired in case of PPP or private projects.
- To safeguard food security and to prevent arbitrary acquisition, the Bill directs States to impose limits on the area under agricultural cultivation that can be acquired.
- In case land remains unutilised after acquisition, the new Bill empowers states to return the land either to the owner or to the State Land Bank.

- No income tax shall be levied and no stamp duty shall be charged on any amount that accrues to an individual as a result of the provisions of the new law.
- In every project those losing land and belonging to the SC or ST will be provided land equivalent to land acquired or two and a one-half acres, whichever is lower (this is higher than in the case of non-SC/ST affected families) -Where the affected families belonging to the SC and the ST are relocated outside of the district then they shall be paid an additional 25% rehabilitation and resettlement benefits to which they are entitled in monetary terms along with a one-time entitlement of 50,000 rupees.

Minimum R&R Entitlements under this Act

The following are the minimum R&R entitlements under this Act:

1. Subsistence allowance at INR. 3000 per month per family for 12 months;
2. The affected families shall be entitled to: (a) Where jobs are created through the project, mandatory employment for one member per affected family or (b) Rupees 5 lakhs per family; or (c) Rupees 2000 per month per family as annuity for 20 years, with appropriate index for inflation; The option of availing (a) or (b) or (c) shall be that of the affected family
3. If a house is lost in rural areas, a constructed house shall be provided as per the Indira Awas Yojana specifications. If a house is lost in urban areas, a constructed house shall be provided, which will be not less than 50 sq.mt. in plinth area. In either case the equivalent cost of the house may also be provided in lieu of the house as per the preference of the project affected family;
4. One acre of land to each family in the command area, if land is acquired for an irrigation project if possible BUT the same shall be in lieu of Compensation;
5. INR 50,000 for transportation;
6. A one-time Resettlement Allowance of INR. 50,000;

Special Provisions for SCs and STs

In addition to the R&R package, SC/ST families will be entitled to the following additional benefits:

1. Land to be given to each family in every project even in the case of irrigation projects;
2. One time financial assistance of INR. 50,000 per family;
3. Families settled outside the district shall be entitled to an additional 25% R&R benefits;
4. Payment of one third of the compensation amount at very outset;
5. Preference in relocation and resettlement in area in same compact block;
6. Free land for community and social gatherings;
7. In case of displacement, a Development Plan is to be prepared.
8. Continuation of reservation and other Schedule V and Schedule VI area benefits from displaced area to resettlement area.

2.5.2 The Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, 2014

Government of India (GoI) recently enacted the Act that specifically aims to protect the rights of urban street vendors and to regulate street vending activities. It provides for survey of street vendors and protection from eviction or relocation; issuance of certificate for vending; provides for rights and obligations of street vendors; development of street vending plans; organizing of capacity building programs to enable the street vendors to exercise the rights contemplated under this Act; undertake research, education and training programs to advance knowledge and understanding of the role of the informal sector in the economy, in general and the street vendors, in particular and to raise awareness. This Act requires that no street vendor shall be evicted or relocated till a survey is conducted and a Certificate of vending is issued by Town Vending Committee formed under Section 22 of the Act. According to Section 18 of the Act, the local authority may, on the recommendations of the Town Vending Committee, declare a zone or part of it to be a no-vending zone for any public purpose and relocate the street vendors vending in that area. No street vendor shall be relocated or evicted by the local authority from the place specified in the certificate of vending unless he has been given thirty days' notice. However, every street vendor, who possesses a certificate of vending, shall, in case of his relocation under section 18, be entitled for new site or area, as the case may be, for carrying out his vending activities as may be determined by the local authority, in consultation with the Town Vending Committee.

2.5.3 Some Key Legal Provision Related to Women

- The Dowry Prohibition Act, 1961 (28 of 1961) (Amended in 1986)
- The Indecent Representation of Women (Prohibition) Act, 1986
- The Commission of Sati (Prevention) Act, 1987 (3 of 1988)
- Protection of Women from Domestic Violence Act, 2005
- The Sexual Harassment of Women at Workplace (Prevention, Prohibition, and Redress) Act, 2013
- The Criminal Law (Amendment) Act, 2013
- The Immoral Traffic (Prevention) Act, 1956

2.5.4 Other Applicable Acts

The following acts are applicable for the sub-projects to be taken up under the present project:

- Minimum Wages Act, 1948
- Contract Labour Act, 1970
- The Bonded Labour System (Abolition) Act, 1976
- Child Labour (Prohibition and Regulation) Act 1996 along with Rules, 1988
- Children (Pledging of Labour) Act, 1933 (as amended in 2002)
- The Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995

- The Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Rules, 1996
- Untouchability Offences Act, 1955
- The Scheduled Castes and the Scheduled Tribes (Prevention of Atrocities) Act, 1989
- The Scheduled Castes and the Scheduled Tribes (Prevention of Atrocities) Rules, 1995
- Disaster Management Act 2005: specifies that while providing compensation and relief to victims of disasters there shall be no discrimination on the grounds of sex, caste, community, descent or religion.

2.6 Other Legislation Applicable for APUWSSMP

Environmental and Social issues during construction stage generally involve equity, safety and public health issues. The APUFIDC require complying with laws of the land, which include inter alia, the following

Table 2-3: Other Relevant Legislations and their Provisions

Act	Year	Provisions
Workmen's Compensation Act	1923	The Act provides for compensation in case of injury by accident arising out of and during the course of employment
Payment of Wages Act	1936	It lays down as to by what date the wages are to be paid, when it will' be paid and what deductions can be made from the wages of the workers
Equal Remuneration Act	1979	The Act provides for payment of equal wages for work of equal nature to Male and Female workers and not for making discrimination against Female employees
Inter-State Migrant Workmen's (Regulation of Employment and Conditions of Service) Act	1979	The inter-state migrant workers, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, travelling expenses from home to the establishment and back, etc
The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act and the Cess Act	1996	All the establishments who carry on any building or other construction work and employs 10 or more workers are covered under this Act; the employer of the establishment 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 Factories Act	1948	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
Hazardous Wastes (Management and Handling) Rules	1989	Occupiers generating hazardous wastes given in the list shall take all practical steps to ensure that such wastes are properly handled, i.e. collection, reception, treatment, storage, and disposed of without any adverse effects to human health and environment (Rule 4 Such occupier shall apply for authorization in prescribed format to the State Pollution Control Board).
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.

2.7 Statutory Clearances

It is expected that certain permission, clearances and authorizations need to be obtained from competent authorities during the design, planning and implementation of the sub-projects. This will depend mainly on the area, type, size and scope of the sub-project. This requirement is summarized below

Table 2-4: List of Statutory Clearances and Authorization Requirements

S. No.	Clearance/ Authorization	Relevant Act	Competent Authority	Responsibility
1	Environment Clearance/NOC (For sub-projects which requires such clearance in hilly terrain (above 1000 AMSL) and in ecologically sensitive areas, if their location requires)	EIA Notification, 2006 (including amendments) issued under Environment Protection Act, 1986; F. No.11-48/2002-FC, MoEF, dated 14th September 2004 F. No. 6-10/2011 WL, MoEF, dated December 2012	State Pollution Control Board; MoEF, Govt. of India, National Board of Wildlife	PMU/ Line Department
2	Forest clearance	Forest Conservation Act, 1980	State Forest Department, MoEF, Govt. of India	PMU/ Line Department
3	Tree Cutting Permission	Forest Conservation Act, 1980	State Forest Department MoEF, Govt. of India	PMU/ Line Department
5	Storage, handling, transport and disposal of hazardous materials	Hazardous Waste (Management and Handling) Rules, 1989 and Manufacturing, Storage and Import of Hazardous Chemicals Rules, 1989	State Pollution Control Board	Concerned Contractor
6	Location/ layout of workers camp, equipment and storage yards	Environment Protection Act, 1986 and Manufacturing, Storage and Import of Hazardous Chemicals Rules, 1989	State Pollution Control Board	Concerned Contractor
7	Discharges from Labor Camp	Water (Prevention and Control of Pollution) Act, 1974	State Pollution Control Board	Concerned Contractor
8	Permission for sand mining from river bed	Environment Protection Act, 1986	Mines and Geology Department, GoAP	Concerned Contractor
9	Permission for working in protected areas	The Indian Wildlife Protection Act, 1972, amended 1993 The Wildlife (Protection) Amendment Act 2002	Chief Wildlife Warden, GoAP	PMU/ Line Department
10	Permission for working in protected areas	The Ancients monuments ands Archeological Sites and Remains Act 1958 and Rules 1959	Secretary, Culture Department, GoAP	PMU/ Line Department
11	Pollution Under Control certificate for vehicles	Central Motor Vehicle Act 1988	Transport Department, GoAP	Concerned Contractor/ Department
12	Employing Labour/ Workers	The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996	Labour Department, GoAP	Concerned Contractor/ Department

2.7.1 Environmental Clearance for Water Supply Projects

As per the MoEF gazette Notification SO 1533 under sub-rule (3) of Rule 5 of the Environment (Protection) Rules, 1986 dated 14th September 2006, it does not include water supply projects under the purview of Environmental Clearances. However subsequent amendments to the notification through gazette notification S.O. 1598(E) dated 25th June 2014 states:

"Non-irrigation projects such as large drinking water supply projects with submergence area > 5000 ha will be considered as category 'A' projects while projects with submergence area < 5000 ha will be considered as Category 'B' projects."

However, the Draft Environmental Clearance Framework of the MoEF states that ***"Water supply projects with more than 4500 m³/day are classified as Category 'B1' and require REIA for Environmental clearance at state level"*** An extract showing this is presented below:

Table No: 2.2 Developmental Activities requiring REIA for Environmental Clearance at State Level (Cat-B1)

S.No.	Category of Developmental Activity	Remarks
1.	All developmental activities mentioned under the Category-A and falling within the intermediate thresholds mentioned, wherever applicable. Higher threshold shall be that mentioned for Category-A projects and the lower threshold being 10% of that mentioned for Category-A.	In the manufacturing segment, product substitution and change in product mix should be considered for clearance at state-level.
2.	All industrial / other developmental activities other than those mentioned under category-A but require to undertake consents/authorisation procedures under various Environmental Acts and found to require REIA for environmental decision-making after undertaking case-by-case screening.	-
3.	Infrastructure developmental activities that do not fall in the above two lists, but are expected to grow in recent future and have a potential to cause adverse impact on the environment. An indicative list of such activities are presented below:	
	Telecommunication infrastructure (laying of cables, erection of towers).	-
	Resort, Recreational and Tourism Development.	
	Urban infrastructure (large housing complexes: more than 100 dwelling units, office complexes: more than 5000m2, hospitals: more than 50 beds, hotels: more than 200 rooms, water supply projects: more than 4500 m3/day.)	
	Largescale Aquaculture and Mariculture (more than 100 ha.)	
	Large-scale Entertainment infrastructure (Cinema Multiplexes with more than 2 screens)	

Table No: 2.3 Developmental Activities requiring case-by-case screening for Environmental Clearance at State Level

S.No.	Category of Developmental Activity	Remarks
1.	All industrial / other developmental activities other than those mentioned under category-A, B1 but require to undertake consents/authorisation procedures under various Environmental Acts	Activities determined as not requiring REIA for environmental decision-making (after a cas-by-case screening) will be given EC based on info provided in the EA form.

3 Baseline Scenario – Secondary Sources

3.1 Demographic Profile of Andhra Pradesh

Situated in a tropical region, Andhra Pradesh has the 2nd longest coastline in the country with a length of 974 km. Andhra Pradesh is the tenth largest state in the Country, in terms of population. As per 2011 Census, the State accounts for 4.10% of the total population of the country. The density of population for Andhra Pradesh is 304 persons per square kilometer, as against 382 persons per square kilometer at all India level in 2011.

The sex ratio in the state is 997 in 2011 and is higher than all India figure of 943 in 2011. The literacy rate of the State is 67.35 percent in 2011. The literacy rate of the State is lower than the all India literacy rate at 72.98% percent. Female literacy rate is 59.96 percent in 2011. Urbanization has been regarded as an important component for growth realization. The percentage of urban population to the total population in the State is 29.47 percent in 2011.

Table 3-1: General Profile of AP

S. No.	Item	Unit	2011
1.	**Population**		
a.	Total	Lakhs	495.77
b.	Male	Lakhs	248.30
c.	Female	Lakhs	247.47
d.	Rural	Lakhs	349.67
e.	Urban	Lakhs	146.10
2.	**Urban Population as a percentage of Total Population**	**Percentage**	**29.58**
3.	**Sex Ratio**	**Females per 1,000 males**	**996**
4.	**Density of Population**	**Persons per sq.km**	**304**
5.	**Growth Rate over the previous Census**	**Percentage**	**9.21**
6.	**No. of Households**		
a.	Total	Lakhs	127.19
b.	Rural	Lakhs	90.65
c.	Urban	Lakhs	36.54
7.	**Household Size**		
a.	Total	No	4
b.	Rural	No	4
c.	Urban	No	4
8.	**Child Population (0-6) years**		
a.	Total	Lakhs	52.22
b.	Rural	Lakhs	26.86
c.	Urban	Lakhs	25.36
9.	**Vulnerable Category**		
a.	Scheduled Caste Population		8.44
b.	Scheduled Caste Population as a percentage of Total Population	Percentage	17.10%
c.	Scheduled Tribes Population	Lakhs	26.31
d.	Scheduled tRIBE Population as a percentage of Total Population	Percentage	5.33%

3.2 Geographical Background

Andhra Pradesh is 8th largest state in the country covering an area of 1,62,975 Sq. km. which is 4.96% of area of the country. Anantapuram is the largest district with 19,100 Sq. km., followed by Kurnool and Prakasam districts (17.7 and 17.6 Thousand Sq. km respectively). Srikakulam is the smallest district with just 5,800 sq. kms followed by Vizianagaram (6500 Sq. Kms.). For administrative purpose Andhra Pradesh is divided into 13 districts with 670 Mandals and 49 Revenue divisions. There are a total of 12,918 Gram Panchayats, 17,363 villages and 195 towns. The capital of Andhra Pradesh is Amaravati.

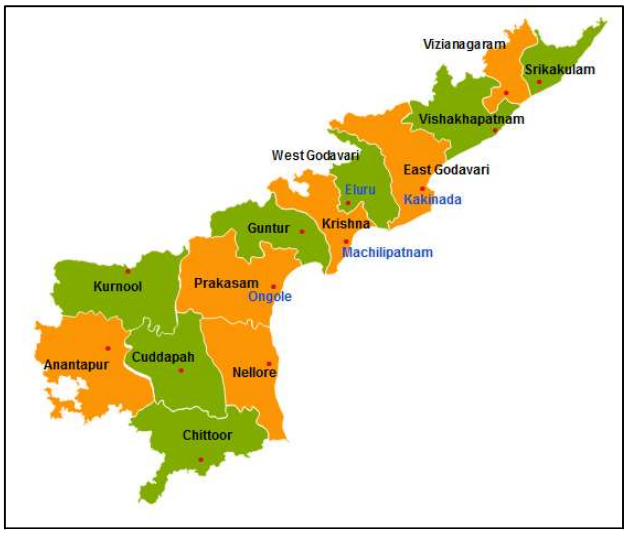


Figure 2: Districts of AP

The state is located between 12°41' and 19.07°N latitude and 77° and 84°40'E longitude. It has a coastline of 974 km with jurisdiction over nearly 15,000 sq. km. territorial waters, the second longest coastline among the states of India after Gujarat. It is bordered by Telangana in the north-west, Odisha in the north-east, Karnataka in the west, Tamil Nadu in the south and the water body of Bay of Bengal in the east. A small enclave of 30 sq. km. of Yanam, a district of Puducherry, lies south of Kakinada in the Godavari delta on the east side of the state.

The state of Andhra Pradesh has a series of mountain ranges including Eastern Ghats, the Nallamalais, Yerramalais and the Seshachalam range of hills. The climate is hot and humid with a normal rainfall of 966.0 mm but actual rainfall during the years 2015-16 and 2016-17 is 606.1 and 912.5 mm respectively. Krishna, Godavari and Penna are the major river systems with their respective tributaries contributing to the river line habitats in the state. The Bay of Bengal runs along the eastern coast stretching over 974 kilometers.

3.3 Environmental Baseline

3.3.1 Agro Climatic Zones

The cropped area in Andhra Pradesh is divided into seven zones based on the agro - climatic conditions. The classification mainly concentrates on the range of rainfall received, type and topography of the soils.

3.3.1.1 North Coastal Zones

This zone covers Srikakulam, Vizianagaram, Visakhapatnam and uplands of East Godavari districts. This zone receives a rainfall of 1000 -1100 mm mainly from south west monsoon. Soil type is red soils with clay base, pockets of acidic soils, laterite soils, Soils with p^H 4 -5.

Main crops grown in these zones are Paddy, Groundnut, Jowar, Bajra, Mesta, Jute, Sun hemp, Sesame, Black gram and Horticultural Crops.

3.3.1.2 Godavari Zone

This zone covers East Godavari Part and West Godavari. Rainfall of this zone is 800 - 1100 mm. Soil type is deltaic alluvium, red soils with clay, red loams, coastal sands and saline soils. Paddy, Groundnut, Jowar, Bajra, Tobacco, cotton, chillies, Sugarcane and Horticultural Crops are the important crops grown.

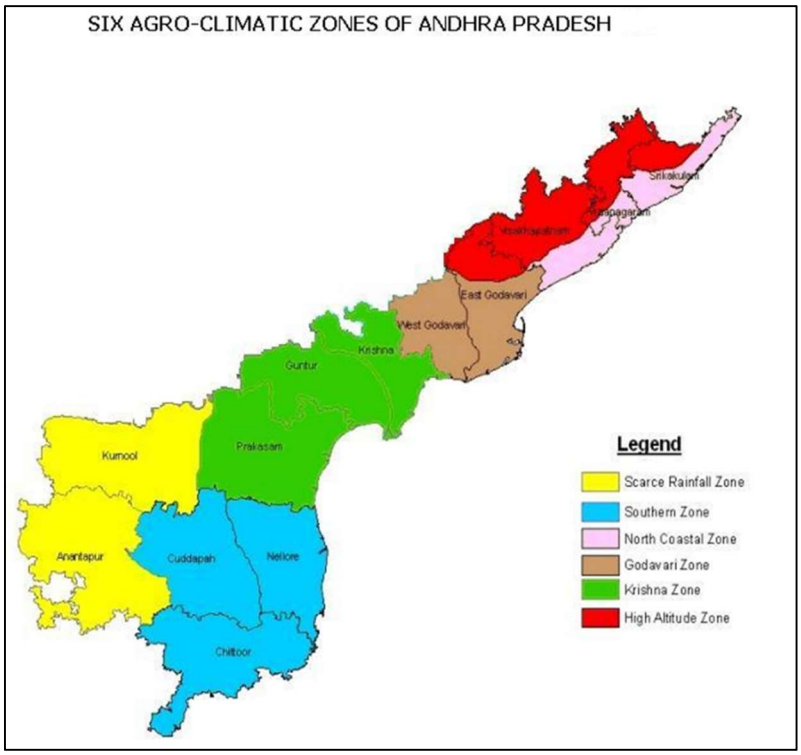


Figure 3: Agro-Climatic Zones of AP

3.3.1.3 Krishna Zone

This zone covers Krishna, Guntur, and contiguous areas of Prakasam. Rainfall of this zone is 800 - 1100 mm. Soil type is deltaic alluvium, red soils with clay, red loams, coastal sands and saline soils. Paddy, Groundnut, Jowar, Bajra, Tobacco, cotton, chillies, Sugarcane and Horticultural Crops are the important crops grown.

3.3.1.4 Southern Zone

Districts in this zone are Nellore, Chittoor, Southern parts of Prakasam and Cuddapah and Eastern parts of Anantapur. Rainfall received is about 700 - 1100 mm. Soil type is Red loamy soils, Shallow to moderately deep. Crops like Paddy, Groundnut, cotton Sugarcane. Millets and Horticultural Crops are mainly grown.

3.3.1.5 Scarce rainfall zone

The districts covered under this zone are Kurnool, Anantapur, Prakasam (western parts), Cuddapah (Northern part), Mahabubnagar (Southern border). Receives a rainfall of 500 – 750 mm. Soil type is red earths with loamy soils (Chalkas), red sandy soils and black cotton soils in pockets. Cotton, Korra, Sorghum, Millets, Groundnut, Pulses, Paddy are the important crops.

3.3.1.6 High altitude and Tribal areas

Northern borders of Srikakulam, Vizianagaram and Visakhapatnam, East Godavari and Khammam are the districts covered under this zone. This zone receives a rainfall more than 1400 mm. Horticultural Crops, Millets, Pulses Chillies, Turmeric and Pepper are the important crops grown.

Table 3-2: Agro-Climatic Zones of AP

Sl. No.	Name of the Zone	Districts	Head quarters	Geographical area (lakh ha)	No. of mandals	No. of ARS*
1	North Coastal Zone	Srikakulam, Vizianagaram, Visakhapatnam	Anakapalle	18.5	88	5
2	Godavari Zone	East Godavari, West Godavari	Maruteru	17.5	96	6
3	Krishna Zone	Krishna, Guntur, Prakasam	Lam	37.70	161	12
4	Southern Zone	Chittoor, Kadapa, Nellore	Tirupati	41.70	161	8
5	Scarce Rainfall zone	Kurnool, Anantapur	Nandyal	36.2	117	5
6	High Altitude & Tribal Areas Zone	High Altitude & Tribal Areas of Srikakulam, Visakhapatnam, East Godavari	Chintapalli	18.0	40	3
Total				**169.6**	**663**	**39**

* - ARS - Agricultural Research Stations

3.3.2 Geographical Zone

Andhra Pradesh has been divided into three major geographic zones. They are:
- Deccan Plateau
- Eastern Ghats
- Coastal Plains

3.3.2.1 Deccan Plateau

The Deccan Plateau characterized with open thorny scrub jungle dominated by the Acacia, Albizia, Hardwickia and allied species. It is interspersed with huge rocky outcrops and grasslands locally called as the kanchas. This area supports a variety of a rich avifauna and endangered herbivores like blackbuck, chinkara, chowsinga etc. Due to extensive hunting, the Asiatic cheetah that once thrived here has become extinct. The Southern Deccan Plateau in Andhra Pradesh locally known as Plateau covers Chittoor, Ananthapuram, Kurnool districts. The plateau has two erosional surfaces with altitudes of 150-600 meters and 300-900 meters above Mean Sea Level (MSL).

3.3.2.2 Eastern Ghats

The Eastern Ghats in Andhra Pradesh representing hill ranges extend from Chittoor district in the south to Srikakulam district in the north cover about 33 percent area of the state. There are series of broken hill ranges, hills and ridges largely covered by forests and uncultivable rocky wastes. The Eastern Ghats have 3 elevation surfaces, viz., 600-900 meters, 900-1200 meters and 1200 - 1600 meters above MSL. The hill ranges are highest in the north, in the interior of Chintapalli and Paderu of Visakhapatnam district (highest peak 1680 meters). Eastern Ghats is a home to a few of the rarest plants in the world like Tree ferns, Cycas beddomeli, Red sanders, etc.

3.3.2.3 Coastal Plains

Coastal plains including the wetlands and the Bay of Bengal in the east stretch about 974 km and cover about 13 percent area of the state. The east coast plain has been divided into six landforms; they are marine, inland plains, Krishna delta, Godavari delta, laterite and sandstone (Rajahmundry). The mangroves of the Godavari and Krishna are extending over an area of 333 sq. km constitute one of the most fragile ecosystems. About 90 percent of the total catch of fish, crustaceous and molluscs are obtained from these coastal areas. Wetlands are the most productive life supporting systems in the world that render immense socio-economical, ecological and bio-aesthetic value to mankind. They are mostly useful for the survival of natural biodiversity and playing an important role in improvement of water quality, removal of sediment load, production of oxygen, control of floods, recharge of aquifers and treatment of pollution abatement.

3.3.3 Rainfall

The normal annual rainfall is 952 mm. Season-wise normal rainfall is 555 mm, 285 mm, 9.8 mm and 96.3 mm in monsoon (June-Sept), post-monsoon (Oct-Dec), winter (Jan-Feb) and summer (March-May) respectively. 58% of annual rainfall occur in SW monsoon, 30% in north-east and 12% in non-monsoon seasons. Annual normal rainfall ranges from 574 mm in Anantapur district to 1166 mm in Srikakulam.

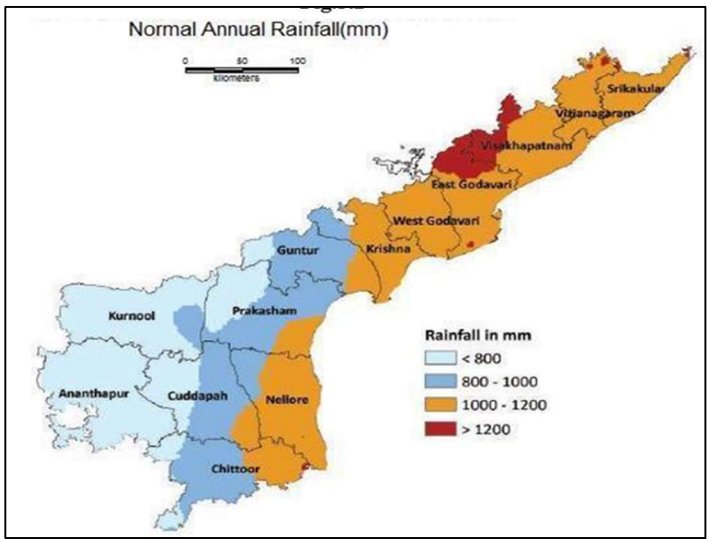


Figure 4: Normal Annual Rainfall of AP

3.3.4 Land Use

Of the total geographical area of the state of 162.97 lakh hectares, 38.09% is under net area sown (62.08 lakh hectares), 22.63 % under forest (36.88 lakh hectares), 8.65% under current fallow lands (14.10 lakh hectares), 12.47% under land put non-agricultural uses (20.32 lakh hectares), 8.27% under barren and uncultivable land (13.47 lakh hectares), 7.63% (12.43 lakh hectares) is under other fallow, cultivable waste lands like permanent pastures and other grazing lands and the remaining land under miscellaneous tree crops and groves are counted for 2.26% (3.69 lakh hectares).

3.3.5 Drainage

The State is drained by 40 major and minor rivers. The important rivers are Godavari, Krishna, Pennar, Palar, Vamsadhara, and Nagavalli. Godavari and Krishna rivers and their tributaries drain the northern and central part and Pennar River drains the southern part of the state before confluence Bay of Bengal. There are 3 major basins and 11 medium river basins in the state. The major river basins are Godavari, Krishna and Pennar and medium basins are Vamsadhara, Nagavalli, Sarada, Yeleru, Gundlakamma, Palleru, Kurieru, Swarnamukhi and inter stream areas between Krishna and Godavari basins.

The drainage pattern is generally dendritic with wide valleys in western peneplain. The drainage in eastern ghat is coarse and dendritic with steep and narrow valleys. Youthful streams and valleys mark the eastern coastal tract intersected by innumerable feeder and distributary canal system. The mature river courses of Godavari, Krishna and Pennar meanders through the vast areas covered by deltas as well as coastal plains. Most of the smaller streams feed innumerable tanks.

The Tungabhadra, Vedavati, Hindri and Paleru rivers drain the northen part of the state. River Penna flows across southern part of the state with its tributaries Chitravati, Papaghni and Cheyyeru and drains major part of Rayalaseema region and Nellore district of coastal region. The drainage basins are characterized by undulating topography comprising a series of ridges and valleys intersperse by hill ranges. The deltas of rivers are very extensive and characterized by considerable thickness of alluvial material. Vamsadhara and Nagavalli rivers with their distributaries drain the northeastern part of the state in Srikakulam district. Visakhapatnam district is mostly drained by local rivulets like Sarada. River Eleru drains East Godavari district while Yerrakalave, Tammileru drain West Godavari district. Nellore district is drained by Pennar, Swarnamukhi and Arani rivers.

3.3.6 Soils

A wide variety of soils occur in the state such as Red soil, Lateritic soil, Black cotton soil, Deltaic alluvium soil, Coastal soil and Saline soil. Red clayey soil occur predominantly in Srikakulam, Visakhapatnam, East Godavari and West Godavari districts in coastal region. Black cotton soil commonly occur in Krishna and Guntur districts. Red earths with loamy soil and red sandy loamy soil and lateritic soil occur in Prakasam and Nellore districts. Black cotton soil is predominant in parts of Kadapa, Kurnool and Anantapur districts in Rayalaseema region, red loamy soil occur in parts of Chittoor and Kadapa districts. Red earths are predominant in Anantapur district.

3.3.7 Agriculture

Andhra Pradesh economy is mainly based on agriculture and livestock. 60% of population is engaged in agriculture and related activities. Rice is the major food crop and staple food of the state. It is an exporter of many agricultural products and is also known as "Rice Bowl of India". The total area under food grains is estimated at 41.34 lakh hectares in 2016-17 as against 41.36 lakh hectares.

The state has three Agricultural Economic Zones in Chittoor district for mango pulp and vegetables, Krishna district for mangoes, Guntur district for chilies. Besides rice, jowar, bajra, maize, minor millet, coarse grain, many varieties of pulses, oil seeds, sugarcane, cotton, chili pepper, mango nuts and tobacco are grown. Crops used for vegetable oil production such as sunflower and peanuts are popular. There are many multi-state irrigation projects under development, including Godavari River Basin Irrigation Projects and Nagarjuna Sagar Dam.

Livestock and poultry is also another profitable business, which involves rearing cattle in enclosed areas for commercial purposes. The state is also a largest producer of eggs in the country and hence, it is nicknamed as "Egg Bowl of Asia". Fisheries contribute 10% of total fish and over 70% of the shrimp production of India. The geographical location of the state allows marine fishing as well as inland fish production. The most exported marine exports include Vannamei shrimp.

3.3.8 Forest

Andhra Pradesh ranks 9th in India having forest cover area of 36909.38 Sq. Kms which amounts to 23.04%.

Out of 36909.38 Sq. Km of forest area,

Very Dense Forest	650.76 Sq. Km
Moderate Dense Forest	11798.58 Sq. Km
Open Forest	10961.70 Sq. Km
Scrub Forest	9310.37 Sq. Km
Non-Forest	3815.84 Sq. Km
Water Bodies	372.13 Sq. Km

State has 13 wildlife Sanctuaries and 3 National Parks covering an area on 8139.89 Sq. Km which is 22.53% of the State's Forest area and 4.448% of the State's Geographical area. There are 1 Tiger Reserve, I Elephant Reserve (Koundinya Sanctuary and Rayala Elephant Reserve), 1 Biosphere Reserve (Seshachalam) 3 National Parks and 13 Wildlife Sanctuaries in the State. The State has 2 Zoological Parks, 2 Deer Parks under Government control, 2 Deer Parks under Private Control and 2 Animal Rescue Centers for Ex-Situ conservation - one in SVZP, Tirupati and one in IGZP, Visakhapatnam, with the assistance of Zoo Authority of India.

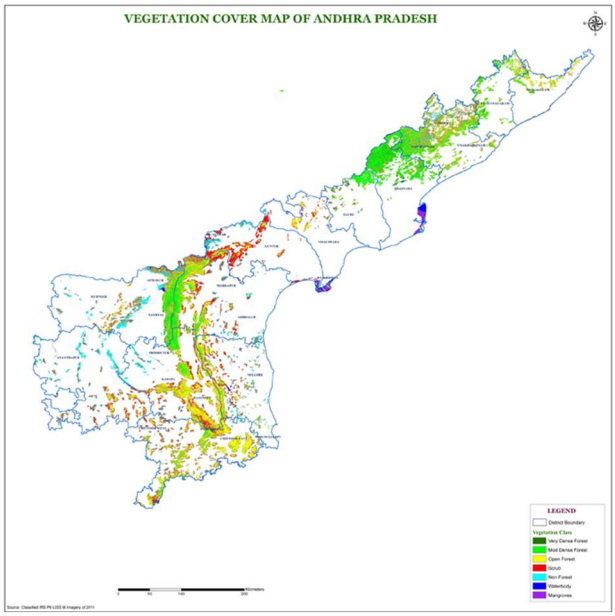


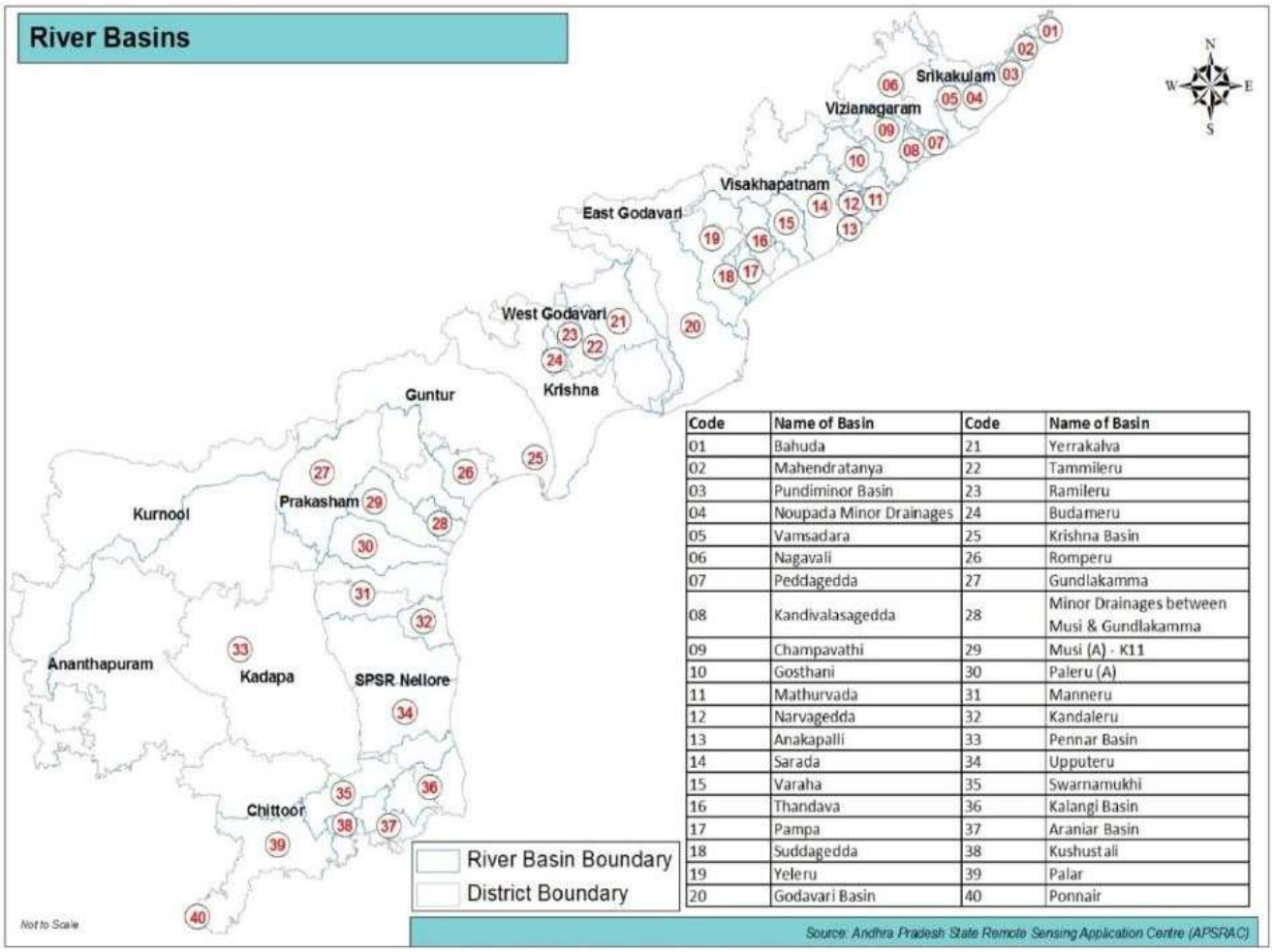
Figure 5: Vegetative Cover of AP

3.4 Water Resources in Andhra Pradesh

Andhra Pradesh is a riverine state with 40 major, medium and minor rivers, of which 12 of them are inter-state rivers. AP is blessed with major rivers such as Godavari, Krishna, Vamsadhara, Pennar and Tungabhadra. However, it is the lowest riparian state even for these major rivers. Roughly 6 percent of the land area in the state is occupied by water bodies. In terms of hydrology, the state is divided into the 40 river basins as illustrated in the map.

3.4.1 Surface Water

The total surface water availability at 75 percent dependability for all river basins is 56.37 BCM (1991 Thousand Million Cubic Feet TMC)), including flood waters, out of which the major contributors are 24.35 BCM (860 TMC) from Godavari, 15.06 BCM (532 TMC) + 4.26 BCM (150.5 TMC) (flood/surplus water) from Krishna and 2.76 BCM (97.6 TMC) from Pennar; accounting for 82 percent of the total surface water availability. A robust infrastructure and sustainable measures can counter the impacts of unreliable and inequitable rainfall distribution and mitigate the effect of natural calamities such as droughts and floods. (Reference)



Code	Name of Basin	Code	Name of Basin
01	Bahuda	21	Yerrakalva
02	Mahendratanya	22	Tammileru
03	Pundiminor Basin	23	Ramileru
04	Noupada Minor Drainages	24	Budameru
05	Vamsadara	25	Krishna Basin
06	Nagavali	26	Romperu
07	Peddagedda	27	Gundlakamma
08	Kandivalasagedda	28	Minor Drainages between Musi & Gundlakamma
09	Champavathi	29	Musi (A) - K11
10	Gosthani	30	Paleru (A)
11	Mathurvada	31	Manneru
12	Narvagedda	32	Kandaleru
13	Anakapalli	33	Pennar Basin
14	Sarada	34	Upputeru
15	Varaha	35	Swarnamukhi
16	Thandava	36	Kalangi Basin
17	Pampa	37	Araniar Basin
18	Suddagedda	38	Kushustali
19	Yeleru	39	Palar
20	Godavari Basin	40	Ponnair

Figure 6: River Basins in AP

3.4.2 Groundwater

The overall stage of groundwater development or utilization is around 45 percent of the available resources which comes up to 14.88 Billion Cubic Metres (BCM), thus utilizable balance is 18 BCM, about 55 percent of the total available quantity. An estimate by the State Groundwater Department in the same year suggested that 13.2 BCM of the 18 BCM is in command areas of major projects. 1.3 BCM could be in forested areas or other non-cultivable areas. Hence, actual balance resource available for further utilization in the state of AP (unified state) is just 3.5 BCM, which is only 10 percent of the available potential.

Table 3-3: Groundwater Status in Andhra Pradesh, 2015

Category	Watersheds	Mandals
Over Exploited (>100% of recharge)	56	41
Critical (90 to 100 of recharge)	14	7
Semi-Critical (70 to 90% of recharge)	52	42
Safe (<70% of recharge)	614	574
Total	**736**	**664**
Notified as Over Exploited Villages (*where construction of new wells and sand mining are banned)*	946 Villages	
Source: Ground Water Department, Govt of AP, 2015		

Critical (GW development is 70 to 90% of recharge). The assessment of the groundwater status at a regional level suggests that there is further potential for groundwater development in the Coastal Andhra and Andhra regions. By increased development of groundwater in these regions, surface water can be conserved and transferred to regions with water stress.

Table 3-4: Groundwater Availability in Andhra Pradesh by region and command areas

Region	Annual Ground Water Availability (TMC)			Existing gross GW draft for all uses (TMC)			GW Balance (TMC)			Stage of Development (%)		
	C	NC	Total	C	NC	Total	C	NC	Total	C	NC	Total
Coastal Andhra	291	172	463	61	65	126	230	107	337	21	38	27
Rayalaseema	44	153	198	15	104	120	29	49	78	34	68	60
Andhra Pradesh	335	325	661	76	169	245	260	156	416	23	52	37
C: Command NC: Non Command												
Source: Groundwater Department												

3.4.3 Water Utilization

Out of all surface water extracted, close to 96 percent, i.e., 28.11 BCM, is used for irrigation purposes. About 3 percent is used for domestic consumption and less than 1 percent for industrial purposes. As AP strives to move towards a more industrial and urban economy, greater water allocation needs to be made for the industrial and domestic sectors. This can be achieved only by driving water use efficiency, primarily in the agriculture sector. While AP strives to enhance its agriculture production and increase its area under irrigation, the savings in water achieved by efficient water use and cropping practices will make more water available for the other sectors. It has also been scientifically proven that efficient irrigation practices such as micro-irrigation help improve crop yields per unit of land and water.

3.5 Present Status of Water Supply and Sanitation

The source of water supply in the state of Andhra Pradesh is primarily from surface water and groundwater. Surface water sources are primarily reservoirs / dams, rivers and canals and groundwater through bore wells. According to PHMED the normal capacity of water supply at the state level is 1688.36 MLD (million liters per day) but however the present supply of all the ULBs put together is 1017.279 MLD with a deficit of 671.081 MLD (39.75%). The present water supplies in majority of urban local bodies in AP are far below the prescribed norms. Adequacy and equitable distribution are the major

problems. In 43 ULBs, the supply is between 70 to 135 LPCD while 62 ULBS are supplying less than 70 LPCD and more than 135 LPCD is in 5 ULBs.

The state of Andhra Pradesh has 70.60 percent of households in urban areas having access to tap water from a treated source for drinking purpose[2]. This is significantly higher in comparison to the total state average of 48.73 percent for both rural and urban areas combined. Out of these 71.52 percent, 45.49 percent of the urban households have tap water (treated source) located within their premises while another 26.03 percent have the location of drinking water tap outside of premises. As per APUFIDC 2015-16 data the cities of Rajahmundry (78.8 percent), Nagari (70 percent) and Atmakur (70 percent), Dharmavaram (69 percent) and Eluru (66 percent) are reporting slightly less than 100 percent coverage of households with water supply connection.

All 13 districts with urban population report less than 90 percent coverage of households with a tap drinking water from a treated source. The districts with highest percentage of household coverage are Kurnool (83.84), West Godavari (81.18), Krishna (78.09), East Godavari (76.42) and Vizianagaram (73.33). The district of Srikakulam has the lowest coverage with 48.54 percent. None of the cities in the state of Andhra Pradesh has 100 percent of households having access to tap drinking water using treated source. Amongst Nagar Panchayats, Naidupeta (66), Puttaparthy(62) Rajampet (60) and Dhone (60) towns have highest percentage coverage of households with drinking tap water from a treated source in the state of Andhra Pradesh. Across the Municipalities of Mangalagiri (65), Narasaroapeta (61.46) and Samalkot (60) are the ULBs with highest percentage coverage of households with tap drinking water from treated source[3].

3.5.1 Supply-side Water Balance in AP

Andhra Pradesh gets 154.75 BCM from rainwater and 38.55 BCM from river flows from upper states. Of this, normally 49.07 BCM is available as surface water and 20.85 BCM as groundwater. Only a portion of this is usable water. The usable surface water is 41.67 BCM, for which the storage capacity created is 35.09 BCM. Excluding dead storage to be maintained in storage systems, live storage amounts to 28.06 BCM. Close to 24 BCM of water is lost due to evaporation and run-off. Due to the depleting groundwater recharge, the available groundwater is only 9.67 BCM. The supply side balance indicates that there is significant scope for enhancing water availability by increasing run-off capture. Figure 6 illustrates the supply side scenario of water in AP[4].

3.5.2 Urban Water Supply Department

Urban Water Supply falls under the purview of Public Health and Municipal Engineering Department and is responsible for the comprehensive design and execution of Water Supply and Sewerage Schemes in all the 97 Municipalities, 12 Municipal Corporations and 1 Grater Municipal Corporation in the state. The main function of the department is to supply water to all the ULBs, provide scientific disposal and treatment

[2] Andhra Pradesh State Sanitation Strategy, Sept 2016.
[3] apvision.ap.gov.in/apstatus-water.php, Water Resources-Institutions and Management
[4] apvision.ap.gov.in/apstatus-water.php, Water Resources-Institutions and Management

of waste water in all ULBs and industries. The department also has Technical Control over all the Engineering works in these Municipal Towns and Corporations. After completion, the Water Supply and Sewerage Schemes are being handed over to the concerned Municipal Corporations and Municipalities for operation and maintenance.

The key urban services being provided by the Public Health and Municipal Engineering Department is decentralized through the municipalities and ULBs. The engineering wing of urban municipalities is responsible for providing urban water supply from source to the end consumer. The Municipal Corporations and the ULBs are responsible for the planning, design, procurement and execution of projects. The PHMED has significantly enhanced its operational efficiency through use of technology for monitoring and communicating between the state and field level officers. However, lack of funds and multi-level approvals are hurdles that PHMED faces during execution of works.

3.5.3 Emerging Issues in Water Supply

Key emerging challenges with regard to drinking water are:

A. Inadequate Water Sources

The available water sources have been tapped to the maximum extent possible. All water sources available nearby have been utilized and present water sources are inadequate. Therefore, there is need to explore and develop additional water sources to meet the current and future water demand.

B. Leakage of Water

The average "Unaccounted for" Water (UFW)/Non-Revenue Water (NRW) ranges from 20% in Nuzivedu to 82.84% in Jangareddygudem in the state. Srikakulam accounts for (36.6%), Vizianagaram (39%), Vishakhapatnam (57.5%), East Godavri (40%) and followed by West Godavri (43%). Water losses due to leakage, pilferage etc. is estimated to be of the order of 20-50% of the total flow in the systems.

C. Poor service levels

In terms of access to individual piped connections, coverage falls short. There are 2,895,505 house service connections. But, the water supply is low.

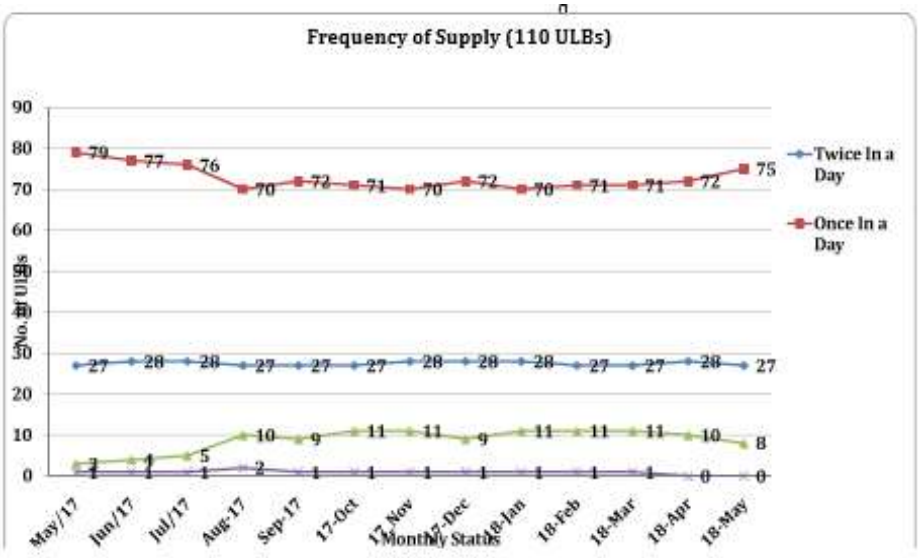


Figure 7: Frequency of Supply (110 ULBs)

Table 3-5: Drinking Water Supply Quantity in MLD – 110 ULBs

Report on Drinking Water Supply Quantity In MLD-110 ULBs (Over Previous Year 2017-18)			
Date	**Normal**	**Present**	**Deficit**
May/17	1693	1616	77
Jun/17	1693	1610	82
Jul/17	1693	1600	93
Aug-17	1688	1603	85
Sep-17	1690	1562	128
17-Oct	1696	1612	83
17-Nov	1697	1619	78
17-Dec	1696	1626	70
18-Jan	1694	1617	77
18-Feb	1754	1670	54
18-Mar	1754	1670	60
18-Apr	1771	1688	83
18-May	1798	1709	89

Source: www.appublichealth.gov.in

3.5.4 Waste Water Treatment and Disposal

Wastewater disposal and treatment is a major problem in cities in Andhra Pradesh. Most of towns and cities in the state do not have underground sewerage systems and sewage treatment services for disposal of the waste water. Only 18.07 percent of urban households in state are connected to underground drainage system and in most of the ULBs in the state the waste water from toilets is been disposed through septic tanks and soak pits and grey form of wastewater from kitchen and bathrooms is directly discharged into the sludge drains without any treatment. Out of the 1688 MLD of water supplied to the ULBs in the state about 1,086 MLD is released as waste water. The waste water treatment facilities are available only in a few ULBs, viz., Visakhapatnam, Vijayawada, Tirupathi, Rajahmundry,Kadapa ,Pulivendula, Yemmiganur, Puttaparthi and Tadipathri.

There is a large gap between generation and treatment of wastewater in the state. In 4 ULBs (GVMC- Visakhapatnam, Vijayawada Municipal Corporation, Yemmiganur and Kadapa) with a total capacity of the waste water treatment of 295 MLD and about 197 MLD capacity of waste water treatment plants are under construction. Even the treatment capacity existing is not effectively utilized due to operation and maintenance problem. Operation and maintenance of existing plants and sewage pumping stations is not satisfactory (for example defunct motors at Puttaparthi STP). Discharge of untreated sewage is single most important cause for pollution of surface and ground water. The problem is not only of adequacy of treatment capacity but also operation and maintenance of treatment plants.

Municipal wastewater collection, treatment, and disposal are still *not a priority by the municipality/ state government* as compared to water supply. In the absence of sewer lines, *untreated wastewater is flowing into storm water drains* and poses health hazards to the

citizens inhabiting the areas near the drain. Moreover, *recycle and reuse of wastewater has not received much attention* by the policy-decision makers perhaps because of the lack of viable models with necessary research and technology support, strong policies and legal framework at the national and state levels and lack of sufficient professional manpower in the urban local bodies.

3.5.5 Water Borne Diseases

Water related diseases are a serious health problem in AP through the year and particularly, during the monsoons. Diarrhoea cases are high and reported from all districts, both urban and rural. Gastroenteritis epidemics are common during the monsoon months in Srikakulam, Vizianagaram and Anantpur. Fluorosis is a major health issue in large parts of the state, with Prakasam, Anantpur and Guntur the worst affected. The following picture shows number of waterborne cases between the years 2014 and 2016 in Andhra Pradesh.

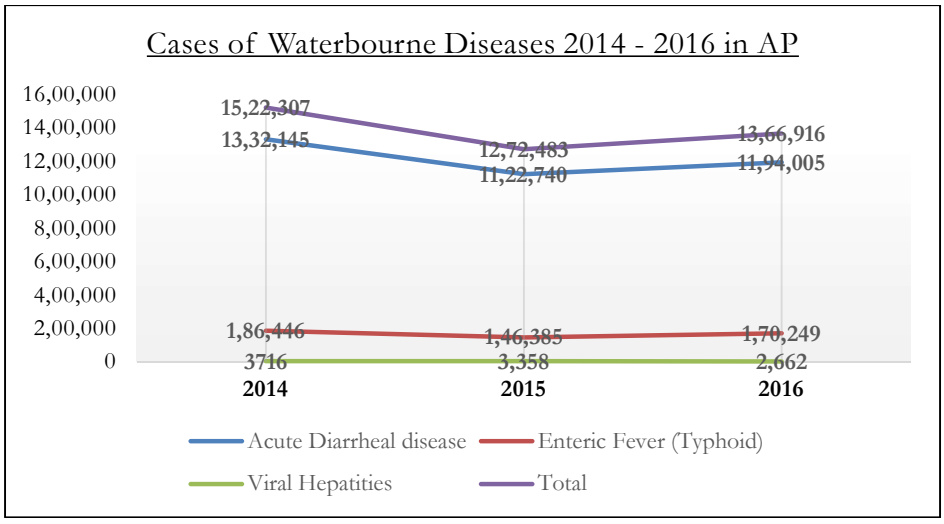


Figure 8: Cases of Waterborne Diseases 2014- 2016 in AP

Source: MoHFW,2017

4 Baseline - Primary Survey

4.0 Introduction

The objective of this primary survey is to a) understand present water supply status and related issues, such as, the perceptions of the beneficiary communities, b) assess the impacts of the proposed project on the beneficiary population, c) assess key community level issues and impacts that might be incorporated into the design, implementation and maintenance of the project and d) review the sustainability of project. To this end a quantitative and qualitative research among the beneficiary communities was conducted on sample basis. For quantitative research, a household questionnaire was developed, tested and administered with the sampled beneficiary community households to collect the information on relevant aspects. Also, qualitative research through Focus Group Discussions (FGDs) with beneficiaries including women was conducted to triangulate the quantitative data obtained through household survey.

The household survey and FGDs were conducted during end-June to end-July 2018. The data collected was computerized and processed in a customized database after scrutiny. The raw data is cleaned, and data analysis was done using a statistical package (SPSS). The findings of the primary survey are presented in following sections.

4.1 Sample Selection

Out of 50 proposed Project ULBs, 10% sample (5ULBs) were selected in consultation with the APUFIDC. Sample Households from each ULB were selected using a multi-stage stratified random sampling in terms of settlement, house connection users, stand post users, public hand pump users, geography, socio-economic groups (upper income, middle income, low income, poor households, slum dwellers etc.). 512 households were surveyed during the study. Details of sampling in each ULB is presented below:

Table 4-1: Sample Size

ULB	Freq	%
Yeleshwaram	100	19.5
Palasa	112	21.9
Macherla	100	19.5
Kanigiri	100	19.5
Puttaparti	100	19.5
Total	**512**	**100**

4.2 Demographic Profile of Households

4.2.1 Religious Composition

Majority of the sampled households were of Hindu religion (88.7%), followed by Muslims and Christians are 5.9% and 5.1%, respectively. The details are given in the table below:

Table 4-2: Households by Religion

Religion	Freq	%
Hindu	454	88.7
Muslim	30	5.9
Christian	26	5.1
Others	2	0.4
Total	**512**	**100**

4.2.2 Social Category (Caste)

Caste wise distribution of the sampled households reveals that the Backward Class people constitute 46% of the surveyed Households. General category formed 29% followed by Scheduled Castes (21.3%) and Scheduled Tribes (2%). The details are given in the table below:

Table 4-3: Households by Social Category

Category	Freq	%
General	149	29.1
SC	109	21.3
ST	10	2.0
BC	236	46.1
Others	8	1.6
Total	**512**	**100**

4.2.3 Household size

The family size of the sampled households surveyed was found to be 3.94. The state average household size 4 which is very near to sample household average. 43.8% of the families are nuclear and small with a size of 1-3 persons, 53.7% with a size of 4-7 persons, and the rest are sized 7 and above persons.

Table 4-4: Size of Family

Range	Freq	%
1-3	224	43.8
4-7	275	53.7
More than 7	13	2.5
Total	**512**	**100**

4.2.4 Literacy

From the sample survey, the educational qualifications of household heads indicate that 61% are literates and rest 39% are illiterates. Out of total sampled households, 22% have education up to Secondary Education, 18.2% with SSC and 11.3% with some kind of a college degree and higher education. The details are given in the table below:

Table 4-5: Educational Qualification of Household Head

Education Level	Freq	%
Illiterate	200	39.1
Up to Secondary School	114	22.3
SSC	93	18.2
Intermediate	47	9.2
Degree & above	54	10.5
Professional	4	.8
Total	**512**	**100**

About 62% Head of the Family reported to be literates; reportedly 5.6% have completed graduation or above, 28.7% are educated up to Secondary school and 19% have completed SSC.

Table 4-6: Educational Qualifications of Spouses of Household Heads

Education Level	Freq	%
Illiterate	194	37.9
Up to Secondary School	147	28.7
SSC	98	19.1
Intermediate	45	8.8
Degree & above	24	4.7
Professional	4	.8
Total	**512**	**100**

4.2.5 Occupational Details

The primary occupation of household heads indicates that 30% are labourers engaged in both agriculture and non-agriculture activities and 9.2% are farmers. While 19.9% are involved in business activities, 16.6% are skilled workers and 7.2% are self-employed. Among those working about 6.8% are in government service and 5.3% are in private service. Primary occupations of the household heads are presented below.

Table 4-7: Occupation of Household Heads

Occupations	Freq	%
Agriculture	47	9.2
Labour	154	30.1
Skilled worker	85	16.6
Govt. Service	35	6.8
Pvt. Service	27	5.3
Self Employed	37	7.2
Professional	17	3.3
Business	102	19.9
Others	8	1.6
Total	**512**	**100**

The table below presents the occupation of spouses of household heads; 57.6% are housewives, while 33.4% are involved in other economic activities. About 26% of the are

labourers. This indicates that these 26% women need to go for work during day time and yet manage to collect water for their households.

Table 4-8: Occupation of Spouse

Occupation	Freq	%
Housewife	295	57.6
Agriculture	6	1.2
Labour	132	25.8
Skilled worker	20	3.9
Govt. Service	3	.6
Pvt. Service	22	4.3
Self Employed	14	2.7
Professional	1	.2
Business	17	3.3
Others	2	.4
Total	**512**	**100**

4.2.6 Housing Pattern

Data on house ownership indicated that more than 74% of the households live in are self-owned houses. And about 26% are rented house.

Table 4-9: Ownership of House

Ownership	Freq	%
Owned	380	74.2
Rented	131	25.6
Govt. Quarters	1	.2
Total	**512**	**100**

About 61% of the total households had pucca structure, 14% are in semi-pucca structure and about 10% are in kutcha houses. In ULBs which were upgraded from Nagar Panchayat to Municipality, existence of multi-storied apartments is slowly emerging. About 15% households reported that they are residing in apartments.

Table 4-10: Type of House Structure

Type	Freq	%
Kutcha	52	10.2
Semi-pucca	71	13.9
Pucca	311	60.7
Apartments	78	15.2
Total	**512**	**100**

4.2.7 Household Assets Details

35.5% of households reported owning bicycles, 95.5% owned television sets and 40.2% were owning refrigerators. 55.7% have two wheelers, 13.9% have three- wheeler and 9.4% have four wheelers. Only about 14.6% have water purifiers at home. This indicates

that household are not very much concerned about quality of drinking water since they do not use municipality water for drinking purpose.

Table 4-11: Household Assets Details

Assets	Freq	%
Cycle	182	35.5
Two- wheeler	285	55.7
Three- Wheeler	71	13.9
Four- Wheeler	48	9.4
Telephone Landline	58	11.3
Radio (FM)	52	10.2
Water Purifiers	75	14.6
Air Conditioner	29	5.7
Television	484	94.5
Fridge	206	40.2
Washing Machine	41	8.0
N=512		

4.3 Income

Income and asset ownership are indicators which would, to some extent, indicate the households' capacity to pay. The study has captured the economic and asset profile of the sampled households. There are 19% households having average monthly incomes of less than Rs. 5000 per month. There are about 45.2% households having monthly incomes of Rs 5,000 – 10,000. About 35.7% have monthly incomes above Rs. 10,000. The average monthly income is about Rs 8,790/-.

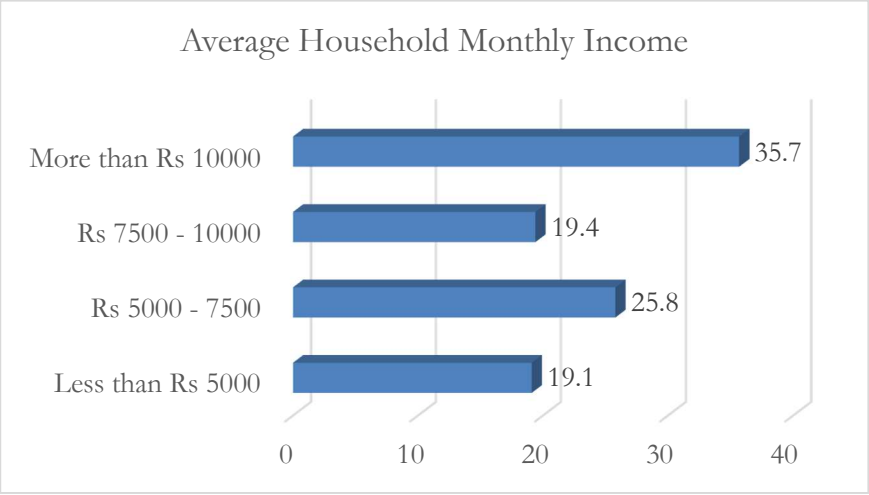


Figure 9: Average Household Monthly Income

4.4 Mobile Phones – Expenditure

Among the households, 97.5% have cell phones. 52.3% household reported having one cell phone, 38.5% have two cell phones and about 4.3% have three cell phones.

Table 4-12: Number of Mobiles of Family Member

Nos	**Freq**	**%**
1	268	52.3
2	197	38.5
3	22	4.3
4	12	2.3
No Mobile	13	2.5
Total	**512**	**100**

The average amount spend by sample household on mobiles is Rs 236 per month. The table below indicates that about 30% household spend more than Rs 200 on cell phone bills., 38.7% respondents spend Rs 100 – 200 and 23.4% spend Rs 50 – 100 on cell phones every month.

Table 4-13: Average Amount Spend on Mobiles per Month

Amount	Freq	%
Less than Rs 50	39	7.6
Rs 50 – 100	120	23.4
Rs 100 – 200	198	38.7
More than Rs 200	155	30.3
Total	**512**	**100**

4.5 Self Help Groups

Women are the most important stakeholder groups for water supply across ULBs. The study has captured the SHG membership of households. Overall 52% households have SHG membership. Out of the SHG members 96.6% household have one SHG member from the household, and 3% have two SHG members from the sampled household.

When asked about their role in the SHG group, 85.7% respondents said that they are ordinary members. 10.9% are the group leaders and 1.5% are second level leaders. During the FGDs it was revealed that the women who were SHG members were very passionate about the project and wanted to play an active role in the water supply project implementation and O&M. It was also noticed that many of the SHG members had encouraging leadership skills and influence amongst community members which can ensure that the project is implemented and operated with considerable public participation.

Table 4-14: Position Held by Family Member in SHG

Position held in SHGs	Freq	%
Leader	29	10.9
2nd LEADERS	4	1.5
Member	228	85.7
Organizer	1	0.4
President	2	0.8
Secretary	2	0.8
Total	**266**	**100**

4.6 Water Supply Related

Total 512 households responded to the question on source of household water supply. There are multiple sources of supply ranging from municipal household connections, stand posts, hand pumps, etc. Municipal household connections and supply through Water Tankers serve the largest number of households. Many households depend on multiple sources because of unreliable municipal water supply.

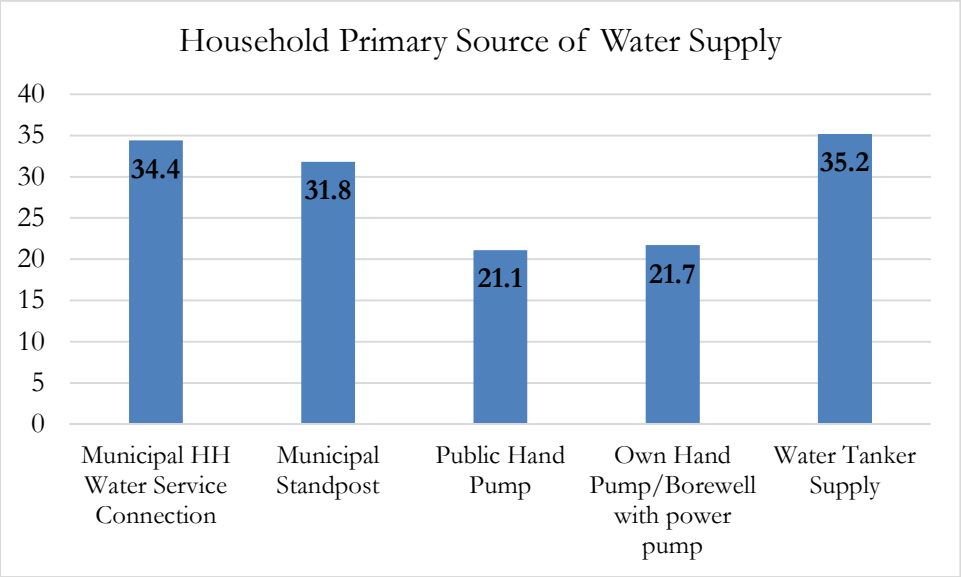


Figure 10: Household Primary Sources of water supply

* *Multiple Response*

4.7 Municipal House Service Connection

4.7.1 Frequency of Water Supply

In urban areas, the households expect an assured water supply at convenient times. Out of 176 total house service connections about 60% reported that they receive water once in day from the municipality water supply connections and 12.5% receives twice in a day. 18.2% household receives once in two days.

Table 4-15: Frequency of Water Supply

Frequency of supply	Freq	%
Once in a day	106	60.2
Every Alternate day	32	18.2
Once in 3 days and above	4	2.3
Two times in One Day	22	12.5
Every Alternate Day - two times	12	6.8
Total	**176**	**100**

When asked about the hours of water supply during the day, 38% said that they received water for one hour, 40% received water for two hours and 15% received water for more than 3 hours. During discussions it was reported that the timing of supply is not fixed or

rather irregular. The supply timings start from anywhere in the early morning to late evening.

Table 4-16: Number of Hours of Water Supply in a day

In Hrs	Freq	%
1	66	38
2	71	40
3	13	7
More than 3 Hrs	26	15
Total	**176**	**100**

4.7.2 User Adaptation and Coping Strategies

As the households are provided with irregular and unassured water supply, some of them have adopted several illegitimate means to tap water from their connections. The survey findings indicate that about 49% of the households having Municipal household connections resort to "pit-tapping" (pits dug up to levels lower than the pipeline to draw water; these pits are made of cement concrete and have steps for getting in). Most of them (34.7%) use booster motor pumps (portable pumps which are connected to taps to draw water; these are used to supplement pit tapping) as well.

Table 4-17: Supplementary Source who have Municipal House Service Connection

Supplementary sources	Freq	%
No supplementary source	87	49.5
Public Hand pump	15	8.5
Own Hand pump/Borewell with power pump	22	12.5
Water Tanker supply	52	29.5
		N=176

Table 4-18: Household methods to draw water

Response	HH uses of Boaster Pump to draw water		HH who dug pit to collect water	
	Freq	%	Freq	%
Yes	61	34.7	86	48.9
No	115	65.3	90	51.1
Total	176	100.0	176	100.0

The supply with low Frequency has compelled the citizens to adopt coping mechanisms by creating household level storage. All types of households depend on storage facilities. It can be observed that 68% of households in slums in these ULBs use drums and vessels for storing the water. 24% uses overhead tanks and underground sumps as well for storage of water.

Table 4-19: Type of Storage

Storage	Freq	%
Sump	41	8.0
Sump & Roof/loft tank	123	24.0
Drums & vessels	348	68.0
Total	512	100

4.7.3 Billing and Payments

At present, the sampled municipalities are charging a fixed rate for house service connections. When asked about the billing and payment for house service connections, 94.3% households affirmed paying the water bills. The households having municipal water connection are charged a flat rate of water tariff ranging between Rs. 50-100 per month.

Table 4-20: Household Paying Water Bill

Response	Freq	%
Yes	166	94.3
No	10	5.7
Total	**176**	**100**

Among those who reported paying the water bills, 83.7% pay the water tariff at municipal office, 9% pay at Mee Seva and 5.4 reported paying online.

Table 4-21: Place of payment of Water Bills

Place	Freq	%
Municipal office	139	83.7
Mee Seva	15	9.0
Pura Seva	2	1.2
Online	9	5.4
Others	1	.6
Total	**166**	**100**

4.8 Fetching Water – Municipal Public Stand Post

The study finds that municipal stand post users who do not have house service connection, spends an average of about half an hour to one hour to fetch water from public stand post. This is primarily due to the fact that the frequency and duration of water supply is irregular in these ULBs.

Table 4-22: Distance between House and Municipal Public Stand Post

Distance	Freq	%
Less than 100 mts	54	33.1
100-300 mts	94	57.7
300-500 mts	15	9.2
Total	**163**	**100**

Table 4-23: Average Time Taken to Collect Water from Public Stand Post

Time Taken	Freq	%
Upto 1/2 hr	84	51.5
1/2 - 1 hr	67	41.1
1 - 2 hr	11	6.7
More than 2 hr	1	0.6
Total	**163**	**100**

Table 4-24: Number of Family Member involved to fetch Water from Public Stand Post

Number of Family Member Involved to Fetch Water from Public Stand Post		
Nos	Freq	%
1	105	64.4
2	50	30.7
3	5	3.1
4	3	1.8
Total	**163**	**100**

Table 4-25: Family Members collecting Water from Public Stand Post

Family Members	Freq	%
Head	47	29
Wife	149	91
Son	34	21
Daughter	12	7
Daughter-in-law	12	7
Grand daughter	1	1
N=163		

Women form the primary group who are engaged in fetching water.

When asked about how water is transported to the house 93.3% said they physically carry. About 3.1% uses cycles to fetch water containers to the house; this denotes that the distance from supply point is quite considerable and confirms that House Service Connections can reduce this drudgery.

Table 4-26: Means to Transport Water from Public Stand Post

Means	Freq	%
Physical Carrying	152	93.3
Bicycle	5	3.1
Rickshaw	2	1.2
Cart	3	1.8
Motorbike	1	.6
Total	**163**	**100**

On difficulties faced in fetching water from stand post, about 47% reported health related problems, viz., neck pain, back pain, joint pain etc. about 25% said that travel distance was a problem and about 15% reported this as an extra burden.

Table 4-27: Difficulties Faced in Fetching water from Public Stand Post

Nature of difficulties	Freq	%
Distance	41	25.2
Water wastage	4	2.5
Fear of violence	10	6.1
Time consuming	7	4.3
Health related problems	77	47.2
Extra burden of work	24	14.7
Total	**163**	**100**

The respondents also expressed their agony regarding standing in a que to collect water from the Public Stand Posts; about 81% respondents said that they have to stand in queues to fetch water and often there are altercations amongst peers.

4.9 Reasons for Not Having House Service Connection

The survey also aimed to understand reasons for households not having municipal house service connection. 33.2% respondents said that they have applied and are waiting for the connections. 6% respondents said they did not have house connections due to low/no pressure in the water pipeline. About 31% respondents said that due to lack of distribution network they are not having a household connection. About 18% households said that they have alternate arrangements (own bore well, hand pump, etc.).

Table 4-28: Reasons for Not Having Household Connection

Reasons for naot having House connections	Freq	%
Can't afford	7	2.1
Recently merged in ULB	13	3.9
No distribution in the area	103	30.8
No pressure/technically not possible	20	6.0
Lengthy process getting one	18	5.4
Applied, but yet to be sanctioned	111	33.2
Others	62	18.6
Total	334	100

Responding to a query on willingness to have a municipality water supply connection, about 68.6% preferred to have individual municipal house service connection in their premises. The reasons for not aspiring for municipal service connection are a) unreliable water supply, b) poor quality of water, c) sluggish response to grievances, d) delay in giving connections, e) expenses incurred in getting connection, f) associated cost for digging pit and buying boaster pump and g) having own arrangement.

4.10 Household Drinking Water Source

The major source of drinking water of sampled households is local RO (Reverse Osmosis) plant. 16.2% depend on packaged/caned water for drinking. 14.5% household uses

drinking water from tanker supply. Only 10.5% uses municipality water for drinking purpose. Some of these RO plants are built by a) Government, b) Charitable Organistions, c) NRIs/ PIOs from the area, d) under CSR activities by local industries and e) from MLA/ MP local area development funds. The cost of water from RO plant varies from plant to plant. If one goes to RO plant to collect water the cost is between Rs. 5 – 10 for 20 litres. When water is supplied at door step in cans then the cost is between Rs. 10 – 20 for 20 litres can. These plants are managed by private persons and in some cases SHGs.

Municipalities supplies Water tankers where there is a) no distribution, b) scarcity of water and c) during non- water supply days. It may be assumed that about 60% of the sampled households are spending a minimum amount of Rs. 300 per month on drinking water.

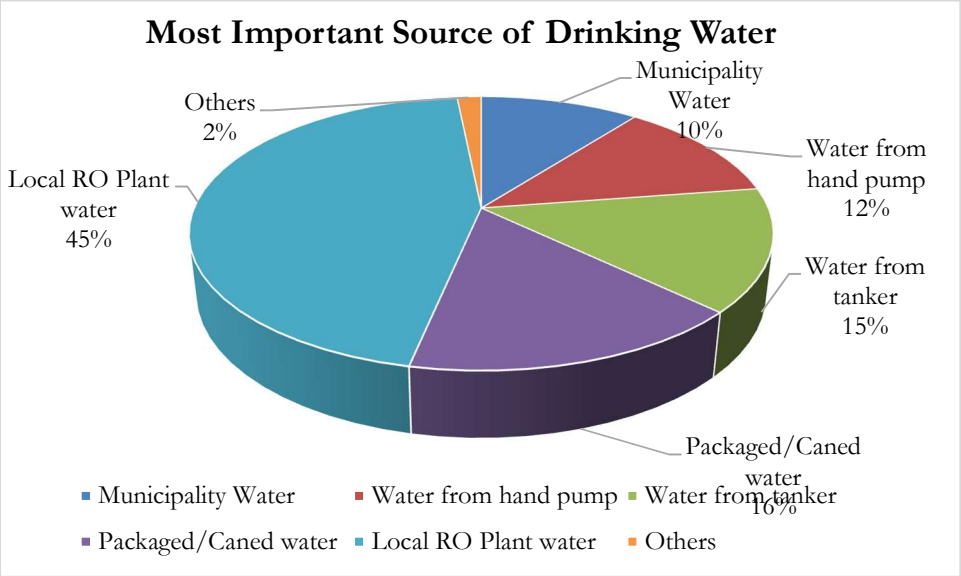


Figure 11: Most Important Sources of Drinking Water

Table 4-29: HH Most Important Source of Drinking Water

Source	Frequency	Percent
Municipality Water	54	10.5
Water from hand pump	62	12.1
Water from tanker	74	14.5
Packaged/Caned water	83	16.2
Local RO Plant water	231	45.1
Others	8	1.6
Total	512	100.0

4.10.1 Household Level Water Treatment

Though water quality is perceived as a problem by users, more than 71% households do not take up any further treatment. Filtering by cloth is a common practice by more than 10% of the households. About 14.5 % households uses electric/ non-electric purifiers for improving water quality. Since majority of households (more than 60%) households are using RO water for drinking purpose these households are not opting for further treatment.

Table 4-30: Methods used by Household to Treat Water to make it Potable

Methods	Freq	%
No further treatment	365	71.3
Boiling	18	3.5
Filtering by cloth	54	10.5
Use candle filters	1	0.2
Aquaguard and other gadgets	74	14.5
Total	**512**	**100**

4.11 Satisfaction Levels

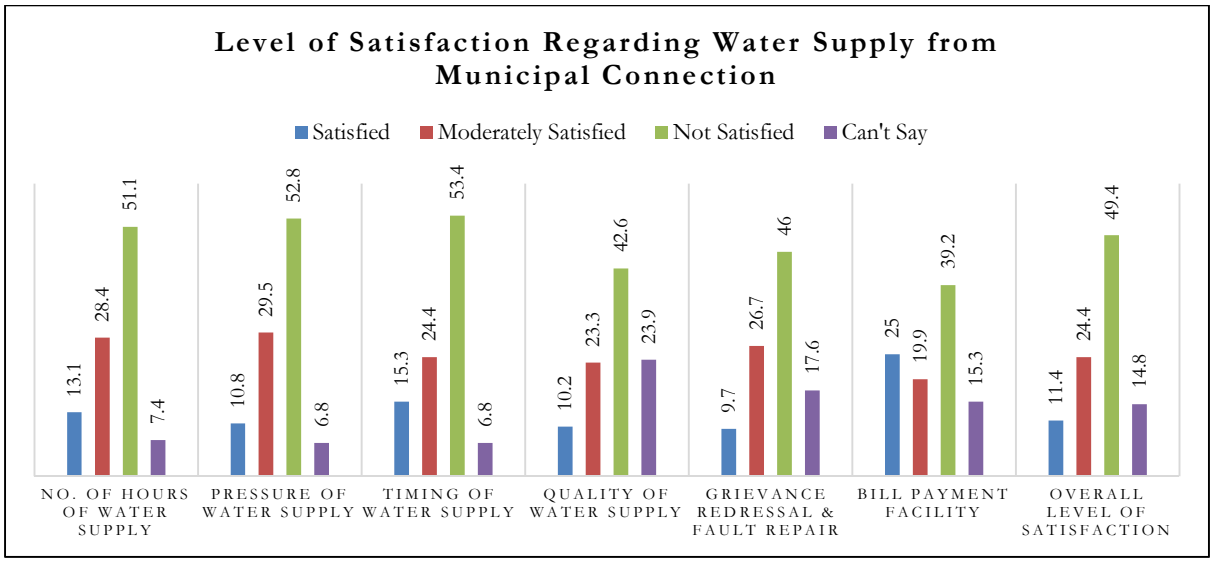


Figure 12: Level of Satisfaction regarding Water supply from Municipal Connection

The findings indicate half of the sampled user households are not satisfied with current water supply services. Households reported problems of irregular frequency and limited hours of supply and inconvenient timing of supply, apart from low response to grievances and delayed fault repair services, poor pressure of water supply and perceived low quality.

4.12 Water Quality

Table 4-31: Water Quality – Municipal Water

Aspects	Freq	%
Colour	148	43.5
Unpleasant Taste, Salty	111	31.8
Smell	35	10.3
Murky	36	10.6
Others	13	3.8
Total	340	100

The survey collected user's perceptions regarding water quality. About 43.5% have reported objectionable colour as water quality problem. The next quality problem reported by 31.8% household is unpleasant taste reportedly salty. About 10.6% had

reported turbidity (murky) as a problem. More than 22% household reported unpleasant taste and smell.

4.13 Water Related Complaints

To the question on 'whether you have ever registered complaints regarding water supply', a large majority 82.8% of the residents responded in the negative. For those who registered a compliant, the most direct approach to make a complaint is with watermen and then the local area corporator.

Table 4-32: Water related Complaints

Place where complaints are lodged	Freq	%
ULB Staff	13	14.8
Corporator	29	33.0
Watermen	45	51.1
Meekosam	1	1.1
Total	**88**	**100**

When asked about the nature of complaint, half (50%) of the complaints are related to inconvenient timing of water supply. About 19.3% have reported for insufficient pressure.

Table 4-33: Type of Complaints

Type of Complaint	Freq	%
Inadequate water supply	11	12.5
Inconvenient timing of water supply	44	50.0
No sufficient pressure	17	19.3
Impurities in water	6	6.8
Bursting of water pipes	2	2.3
Others	8	9.1
Total	**88**	**100**

Table 4-34: Time Taken to Solve Compliant

	Freq	%
Within a day	1	1.1
Within 3 days	13	14.8
Within a week	45	51.1
Within two week	1	1.1
Within 1 month	12	13.6
More than 1 month	5	5.7
Never	11	12.5
Total	**88**	**100**

More than 66% of household who lodged complaints have report that it was solved within a week. In some cases (12.5%), the household reported that it was never solved.

4.14 Expected Water Supply

84.4% indicated that they desire to have improved water supply services. .

Table 4-35: Households preferring improved Water Supply

HH preferred Better Water Supply		
	Freq	%
Yes	432	84.4
No	80	15.6
Total	**512**	**100**

About 93% of the residents desired to receive water supply at least once in a day and about 38% have expected supply of more than 3 hours a day.

Table 4-36: Expected Hours of Water Supply

In Hrs	Freq	%
1	125	28.9
2	94	21.8
3	50	11.6
More tha 3 hrs	163	38
Total	**432**	**100**

4.15 Willingness to Pay for Expected Water Supply

Out of 432 respondents, a large majority are willing to pay for their expected improved water supply services. Of which, 43.1% are willing to pay up to Rs 150 per month, for good quality services. Close to 40% are willing to pay between Rs 150 to Rs 300. This is fairly reasonable, considering the socio-economic profile of respondents.

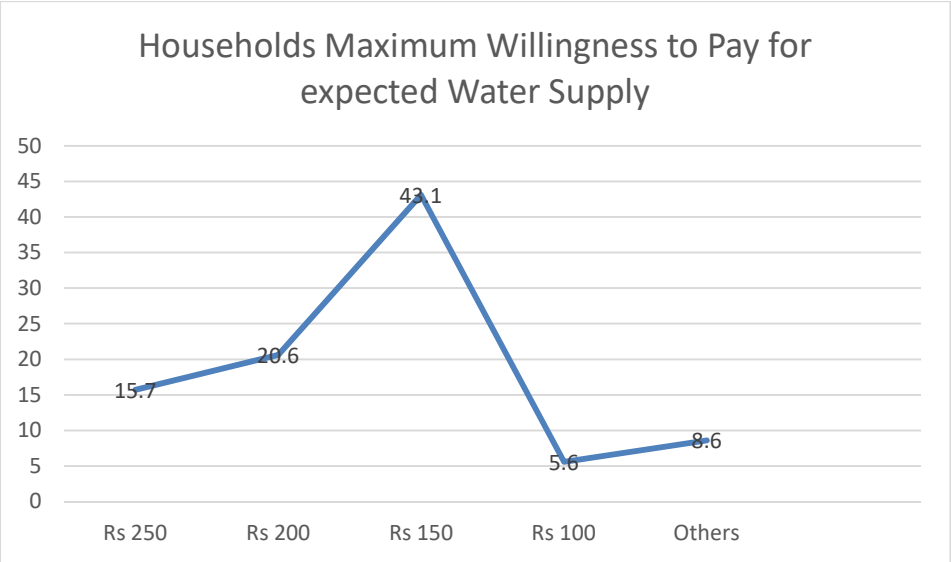


Figure 13: Households Maximum Willingness to Pay for expected Water Supply

Table 4-37: Distribution of Monthly Household Income and Willingness to Pay for Improved Water Supply

Income Level	Less than Rs 5000		Rs 5000 - 7500		Rs 7500 - 10000		More than Rs 10000		Total	
Amount	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Rs 300	8	9.6	0	0.0	4	4.8	16	10.2	28	6.5
Rs 250	18	21.7	16	14.7	15	18.1	19	12.1	68	15.7
Rs 200	19	22.9	14	12.8	14	16.9	42	26.8	89	20.6
Rs 150	30	36.1	56	51.4	35	42.2	65	41.4	186	43.1
Rs 100	4	4.8	8	7.3	8	9.6	4	2.5	24	5.6
Others	4	4.8	15	13.8	7	8.4	11	7.0	37	8.6
Total	83	100	109	100	83	100	157	100	432	100

4.16 Health Related Information

To the question on having knowledge of water borne diseases, only 39.3% responded positively. This is an extremely alarming scenario, given that the awareness regarding the threat of contaminated water and related health impacts are not adequate. Out of sampled households during last one year, family members of 5% households have fallen ill due to typhoid, 15.4% due to diarrhea/ gastroenteritis and 3% due cholera.

Table 4-38: Member of Family Fallen ill during last One year

	Freq	%
Typhoid	27	5
Diarrhoea/ Gastroenteritis	80	15.4
Cholera	13	3
N=512		

** Multiple answer were recorded*

51.8% household reported that they had spent Rs 2500 – 5000 due to these diseases, in a year. 24.7% of them reported to have spent more than Rs 5000.

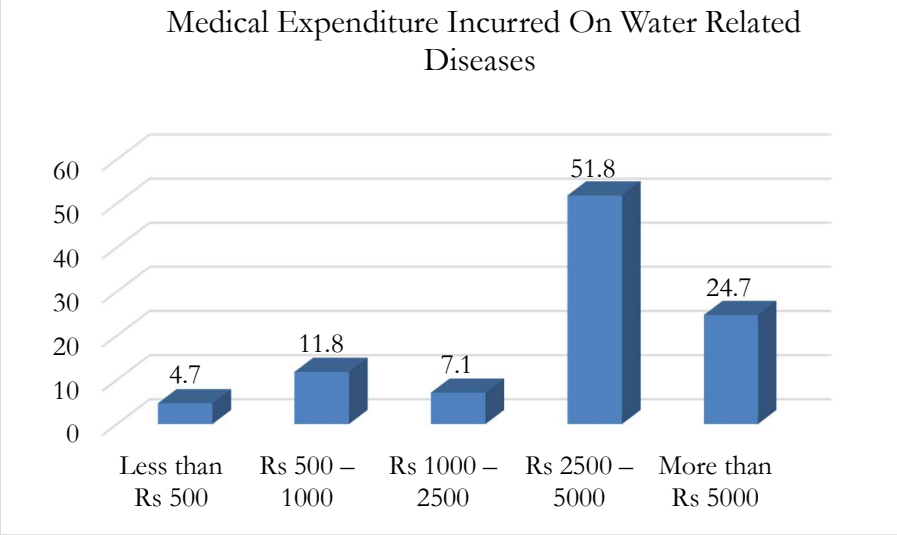


Figure 14: Medical Expenditure incurred on water related Diseases

4.17 Observations and Findings

It was observed that 34% of the sampled households had municipal water supply connections as their primary source. Out of these, about 49% depended solely on municipal water supply connections. Nearly 60% connection holders had water supply at least once in a day while another 19% receive water twice in a day. Evidently more than half of the households who had municipal water connection had to depend on a supplementary source for water supply. It may be noted that 40% of households who have municipal water connection reportedly got water supply for two hours in a day, while another 38% say that they receive water for only one hour per day. It was also observed that only a negligible percentage of households use water from municipal connection for drinking purpose. More than 60% of the households accessed drinking water from local RO plants spending an average amount of Rs. 300 per month. In the above backdrop, it was observed that not more than 10 to 15% of the households having municipal water connection were satisfied with the quality of service, although more than 94% paid their water bills at a flat rate Rs. 50 - 100 per month.

The survey indicated that nearly 84% of the households had demand for improved municipal water supply, while at least 78% of the households were willing to pay a minimum of Rs. 150 per month. it was observed that willingness to pay for water was equal amongst different income groups and an amount of Rs. 150 per month for water supply appeared to be within the affordability of the low-income groups as well, given that an average household was spending Rs. 235 per month on mobile phones. The survey also recorded several forms of discomfort and disadvantages associated with irregular and uncertain water supply, under the current system. This includes the drudgery of women walking long distances and spending long hours for water collection. The survey also indicated that the social landscape of the ULBs are endowed with very strong women groups in the form of SHGs. The focus group discussions further reveal that the local women possessed remarkable leadership skills and had the influence to mobilize the peer groups to participate in the process of project implementation. Understandably, women would be the greatest beneficiaries of the urban water and sanitation projects; incidentally, in the small municipalities of Andhra Pradesh women could also be the most significant facilitators in project implementation and future operations.

5 Environmental and Social Impacts and Risks

5.1 Introduction

The project has been assigned **Category "A"** in accordance with the Asian Infrastructure Investment Bank's (AIIB) Environmental and Social Policy (ESP) and Environmental and Social Standards (ESS). From the project development objectives, it is evident that the project (and the sub-projects) will yield positive and beneficial impacts on the target population. The proposed project will lead to several impacts on the environmental and socio-economic conditions in the project area. A good number of these impacts will be beneficial, especially the availability of adequate potable water in the ULBs, reduction of water borne diseases, reduction in time spent (especially women and children) in accessing water, and the establishment of an environmentally sound, safe and sustainable water supply system.

However, any developmental intervention will also have some negative impacts. Keeping this in view the likely positive and negative impacts (environmental and social) have been identified and are listed below. The significance of these impacts would vary depending on the individual sub-project, its size and location. Apart from these adverse impacts, there are some risks that were identified at this stage.. The table below provides a brief account of risks and impacts associated with each project component. All perceived negative impacts are in general, temporary, reversible and localized; except for the cases where land acquisition will lead to physical displacement. In case of sub-projects in tribal areas or in ULBs with substantial tribal populations a separate TPPF is developed and adopted for the project to mitigate such impacts.

Most environmental risks will emerge out of construction related activities. Construction related hazards and risks need to be appropriately identified and mitigated through application of the Environmental Management Plan which includes safety measures. The construction related risks are entirely manageable.

From an environmental perspective, another major concern is that of the sustainability. It is suggested that a sustainability assessment of every source be conducted. For each source, be it a reservoir, canal or river, sustainability needs to be established based on data available for the last 15 years, in terms of availability, competing uses, etc. on an annual basis. Further necessary mitigation measures such as water harvesting structures, percolation tanks, groundwater recharge initiatives, water conservation initiatives, etc. be implemented for reinforcing the sources. The table below will help to provide the boundary for operationalization of the Environmental Management Plan.

Table 5-1: Area of Impact

S. No.	Project Components	Area and Nature of Influence
1.	Source	Sustainability and reinforcement of source; both upstream and downstream. Sustainability of source to be established in the Detailed Project Reports.
2.	Intake Well and Pump House	One km radius is considered as the area of impact.
3.	Raw water transmission mains	People living on either side of the alignment up to 500 meters.

S. No.	Project Components	Area and Nature of Influence
4.	Water Treatment Plant	Securing of land, biodiversity of the area to assure that no sensitive receptor is impeded
5.	Storage Reservoirs	The ULB area and its surrounding population
6.	Distribution Mains	Entire ULB will be impacted, but in stages
7.	ELSR	The ULB area and its surrounding population

5.2 Positive Impacts

These are positive impacts listed below:

- Improved Drinking Water Supply
- Improved Public Health
- Productive use of time, specially, for women and children
- Health and Environmental improvements
- Improvements in quality of life and human dignity
- Improved community participation and sense of ownership

5.3 Negative Impacts

Supply of safe drinking water is important to ensure the health and safety of a community. Potable water supplies should conform to national and international standards for safe drinking water. Every effort should be made to protect sources of water supply from contamination. Groundwater and surface water can be contaminated in different ways, impacting human health and the environment. Contaminants can seep into groundwater, run into surface water, or get deposited by rain or wind. Bacteria and viruses may be found in sewage sludge, septic tanks, manure and runoff from agricultural operations. These contaminants are usually associated with surface water runoff. Chemical contaminants may come from run off from agricultural areas and waste dump sites. If the water supply is from a surface source, such as a river or lake the local community must be made aware of the location of the water source, so as to protect the headwaters from contamination caused by the dumping of wastes, run-off from farm operations, or leakage from nearby septic systems.

Water supply sub-projects could potentially affect the existing availability of water to a community by altering the flow of water from sources. By channeling water into treatment systems and pipes, existing free flow available to local downstream uses for livestock or irrigation, for example, may be drastically reduced or eliminated. This can have a significant adverse impact on locals. If the community demonstrates that the water diversion is likely to cause long-term or permanent hardship, then an alternative source of water should be sought.

During the construction and operation under the Project, there will also be some negative potential socio-environmental impacts and risks. Pre-Construction impacts and risks include the following:

i) increase in waste water levels in the ULBs, thereby increasing health risks
ii) land acquisition and resettlement

iii) loss of vegetation cover and trees due to site clearance, particularly at the wastewater treatment plant
iv) safety risks associated with site clearance activities
v) excavated materials may be left at the site form the interruptions to existing services such as power supply, drainage, sewerage, etc. and access to commercial establishments and residences

The potential construction-related impacts and risks include the following:

i) increased level of dust, noise and vibration, emission of pollutants from vehicular exhausts;
ii) generation of solid waste and wastewater including some hazardous wastes from construction sites and workers accommodation, these may cause environmental (air, water and soil) pollution and affect human health;
iii) increased traffic safety risks and traffic disturbance;
iv) Damages to the existing infrastructure that may interrupt existing public services such as power or water supply;
v) Health, safety and environmental issues related to the workers and the public with regards to construction activities;
vi) social disturbance to the local people related to the mobilization of workers to the project area;

The proceeding sections provide details of the potential project impacts and their mitigation measures and project related potential risks.

5.4 Impacts

Table 5-2: Potential Negative impacts and their Area of Influence

Potential Impacts	Description	Influence Area
Environmental Impacts		
Contamination of Water Bodies During Construction	Oil spillage from construction machinery and DG sets during operation and/ or maintenance may lead to contamination of surface water and also ground water sources due to leaching. Discharges from the labour camps into water bodies may contaminate the water bodies Construction waste and debris disposed in the water bodies may lead to contamination of water sources and water bodies. Siltation problems may occur in dams/ reservoirs or at downstream ends of the rivers due to disposal of debris into these. Stockpiling of construction material near the water bodies may lead to contamination of water.	Source Water bodies Ground Water Sources Areas in the vicinity of the water body
Air Pollution	Operation of construction machinery and DG sets during construction and operation phases will lead to air pollution Dust contamination at construction sites Improper solid waste disposal of waste generated in construction and labour camps may lead to air, soil and water pollution	Entire stretch where the construction activities are taking place Locations of DG sets
Noise Pollution	Operation of construction machinery and DG sets during construction and operation phases will lead to noise pollution Impact would be significant in case of presence of the noise sensitive receptors in the vicinity of the construction site	Construction site DG set locations
Environmental Impacts on Land	Operation, maintenance and refueling of construction vehicles/ machinery and equipment may lead to spillage of fuels and lubricants which may further leach into the soil thus contaminating the land. Fuel oil and lubricant spillage at storage sites in construction camps Compaction of land due to movement of heavy construction machinery	Construction sites Oil storage sites
Tree Cutting	Cutting of trees along the pipeline alignment, where necessary. Cutting of trees as part of site clearance for different facilities	Alignment of water supply network Location of other facilities – storage structures, WTP
Sludge and Waste Water Disposal	Disposal of sludge and waste water to designated sites which may require acquisition. Improper disposal may lead to pollution and/ or contamination of land and water bodies	Sludge and waste water disposal site
Fugitive Dust Pollution near settlements	Dust pollution due to excavation during construction may cause inconvenience to the people and may lead to breathing problems for the workers and people residing near the construction site.	Area within 500 m radius of construction sites

Potential Impacts	Description	Influence Area
Utility Shifting	Utility shifting along pipeline alignments, where necessary. Utility shifting as part of the site clearance for different facilities of the water supply system	Alignment of water supply network Location of other facilities – storage structures, WTP
Impacts due to increase in waste water and related health risks	The increased amounts of water supplied to ULBs (from 70 lpcd to 135 lpcd) will lead to more waste water. If not properly treated and disposed, this waste water may form pools and lead to unhygienic conditions and pose health risks.	Entire ULB and its surroundings and downstream
Social Impacts		
Displacement and Loss of Livelihood due to Land Acquisition	Construction of facilities and laying of water supply network may require land and this will lead to - Relocation of Squatters and encroachers - Acquisition of agricultural land leading to loss of livelihoods - Any other form of land securing requiring procedural measures as indicated in the RPF	Alignment of water supply network Location of other facilities – storage structures, WTP, etc.
Relocation of Common Property Resources	Common Property Resources at the proposed sites for project components may have to be shifted.	Location of other facilities – storage structures, WTP, etc. Alignment of water supply network
Traffic Disruptions	Movement of construction vehicles, machinery, digging of trenches for laying pipelines for transmission of raw and clear water and distribution network, stockpiling of excavated earth along pipeline alignments may lead to congestions. In case the alignment of supply network crosses the road intersections it may lead to temporary disruptions and inconvenience.	Alignment of water supply network Road intersections
Temporary disruption of economic activities	Laying of pipelines in congested market areas may lead to forced closure of the enterprise for a period of construction leading to disruption of economic activities.	Congested areas through which the alignment of water supply network passes
Occupational Hazards while working on construction sites	Improper or no use of personal protective equipment by construction workers may lead to occupational hazards – accidents leading to injuries, during construction activities	Construction sites

5.4.1 Impacts due to Labour Influx

Social impacts are critical to address, as even a modest labor influx may lead to negative impacts on the host community. Pre-existing social issues in the host community can easily be exacerbated by the influx of labor. The common categories of social risk associated with labor influx are as follows:

- **Risk of social conflict:** Conflicts may arise between the local community and the construction workers, which may be related to religious, cultural or ethnic differences, or based on competition for local resources. Ethnic and regional conflicts may be aggravated if workers from one group are moving into the territory of the other.

- **Increased risk of illegitimate behavior and crime:** The influx of workers and service providers into communities may increase the rate of crimes and/or a perception of insecurity by the local community. Such illegitimate behavior or crimes can include theft, physical assaults, substance abuse, prostitution and human trafficking.

- **Impacts on community dynamics:** Depending on the number of incoming workers and their engagement with the host community, the composition of the local community, and with it the community dynamics, may change significantly. Pre-existing social conflict may intensify as a result of such changes.

- **Increased burden on and competition for public service provision:** The presence of construction workers and service providers (and in some cases family members of either or both) can generate additional demand for the provision of public services, such as water, electricity, medical services, transport, education and social services. This is particularly the case when the influx of workers is not accommodated by additional or separate supply systems.

- **Increased risk of communicable diseases and burden on local health services:** The influx of people may bring communicable diseases to the project area, including sexually transmitted diseases (STDs), or the incoming workers may be exposed to diseases to which they have low resistance. Workers with health concerns relating to substance abuse, mental issues or STDs may not wish to visit the project's medical facility and instead go anonymously to local medical providers this can result in an additional burden on local health resources.

- **Local inflation of prices, accommodations and rents:** A significant increase in demand for goods and services due to labor influx may lead to local price hikes and/or crowding out of community consumers. Depending on project worker income and form of accommodation provided, there may be increased demand for accommodations, which again may lead to price hikes and crowding out of local residents.

- **Increase in traffic and related accidents:** Delivery of supplies for construction workers and the transportation of workers can lead to an increase in traffic, rise in accidents, as well as additional burden on the transportation infrastructure.

5.5 Mitigation measures

Detailed mitigation measures of the potential risks and negative impacts are presented in the Chapter 6 of the document which details out the Environmental and Social Management Plan for the project.

5.6 Project Associated Risks – Management and Mitigation Measures

Table 5-3: Potential Project Risks - Management and Mitigation Measures

Project Components	Likely Social and Environmental Risks	Management/ Mitigation Measures
Source		
Environmental Risks	Sustainability	Source Sustainability to be determined in the design stage and measures to be undertaken as mentioned in the ESMP. These measures should be included in the DPR including costing for the same.
	Quantity	Availability of water and sustainability to be assessed in the design stage and findings of the study presented in the DPR
	Contamination	Measures to be taken to prevent contamination of source during construction as detailed in the EMP.
Raw water transmission mains		
Social Risks	Disruption of Social / Cultural Activities	ESMP has provision for intimation to communities prior to start of construction activities
Environmental Risks	Disruption of services due to Damage of existing utilities during construction	ESMP has provision for immediate restoration of such services
Treatment Plant		
Environmental Risks	Unauthorized Blasting Operations	Any Blasting Operation required during site preparation to be initiated after obtaining prior approvals as per the details provided in the EMP.
	Disposal of Sludge and Waste water in nearby stream or storm water drains	Sludge and waste water to be disposed off as per the CPEEHO manual
	Non-compliance with water quality standards	Water Quality monitoring protocol has been established both after treatment and at consumer end. EMP provides for the Drinking Water Quality Standards to be maintained and monitored.
Storage Reservoirs		

Project Components	Likely Social and Environmental Risks	Management/ Mitigation Measures
Environmental Risks	Contamination	Measures provided in the design to prevent contamination such as compound wall, watchman, manhole covers, wire mesh covers for ventilators, etc.
Distribution Network		
Social Risks	Disruption of Social / Cultural Activities	ESMP has provision for intimation to communities prior to start of construction activities
Environmental Risks	Disruption of services due to Damage of existing utilities during construction	ESMP has provision for immediate restoration of such services
	Distribution Losses	EMP provides for maintaining facilities for leak detection and repair
	Water supply pipes to cross storm water drains and/or sewerage network	The casing is to be provided at the intersections as detailed out in the designs and the Supervision Consultants to monitor construction activities at such locations
Service Connections		
Social Risks	Exclusion of Vulnerable Category People	ESMF supports inclusion of vulnerable groups to ensure timely connection and complete coverage of vulnerable groups A Tribal Development Framework, Vulnerable Inclusion Strategy and a Gender Action Plan have been prepared to check this risk in the planning stage itself. Monitoring indicators developed for the project will track this risk
	Vulnerable groups, women and tribal may be excluded from project activities, training and capacity building activities.	A Tribal Development Framework, Vulnerable Inclusion Strategy and a Gender Action Plan has been prepared to check this risk in the planning stage itself. Monitoring indicators developed for the project will track this risk
	People from project area may not respond to the project activities and may not participate in the project as they may not understand the social development dimensions.	A strategy for inclusion and participation strategy provided to mitigate this risk in the planning stage itself. Awareness generation and mobilization strategy provided in the TDF to ensure participation of the vulnerable tribal women and men. Project design promotes community participation in forestry operations to engage community stakeholders. Stakeholder engagement roadmap to be developed under the project to create awareness within communities about rights/ entitlements and define rules of engagement. A detailed capacity building strategy (involving the communities/ community institutions as well as forest department) and budget provided to address this risk.

Project Components	Likely Social and Environmental Risks	Management/ Mitigation Measures
	The project stakeholders may not be able to understand their roles related to social issues.	A detailed capacity building strategy and budget provided to address this risk. Deployment of community facilitators in the field to creare awareness about roles and responsibilities. Monitoring mechanism developed for the project will adapted to track this risk
	Grievance of project key stakeholders may not be addressed properly.	A robust Grievance Redressal Mechanism is proposed to be set up to address this risk during planning and implementation. An NGO at each circle is proposed to address this risk during planning and implementation.
	Project information may not reach the key stakeholders, thus making them disinterested in participating.	A detailed IEC campaign is proposed before project activities take off to address this risk during design stage itself. NGO at each circle is responsible for social mobilization are proposed to address this risk during planning and implementation. Culturally appropriate IEC material to be developed aimed at the indigenous communities

5.7 Climate Change Consideration

5.7.1 Climate Change - Likely Impacts on Urban Local Bodies (ULBs)

Climate Change (or Changing Climate) is generally referred to as a change in global or regional climate patterns, in particular a change apparent from the mid to late 20th century onwards and attributed largely to the increased levels of atmospheric carbon dioxide produced by the use of fossil fuels. The potential climate change impacts are diverse, among them that impact water sector include;

- Groundwater depletion
- Water shortages (both surface and underground water)
- Salt water intrusion into groundwater supplies in coastal areas
- Increased riparian flooding and erosion
- Increased coastal flooding and erosion
- Increased flash floods
- Increased storm surge hazard – how is this relevant
- Damage to water supply infrastructure not designed to withstand climate change impacts
- More favourable breeding grounds for pathogens (e.g. mosquitoes and malaria) – in case of poor environmental sanitation

5.7.2 Climate Change Adaptation/ Mitigation Actions

Below given are various climate change impacts and adaptation/ mitigation actions.

These actions are divided into 5 categories,

1. Policies/ Regulation
2. Research Studies
3. ULB Level Plans and Programs/ Campaigns
4. Sub-Project Actions

The actions identified as Sub-Project Actions (mitigation actions) needs to be initiated under the project. The ULB and the design and supervision consultants need to ensure their implementation under relevant sub-projects.

Table 5-4: Climate Change Adaptation/ Mitigation Actions

Climate Change Impact	Policies/ Regulation	Research Studies	ULB Level Plans and Programs/ Campaigns	Sub-Project Actions
Groundwater depletion		• Research underlying causes (e.g. increased runoff due to deforestation or other land use changes)	• Disaster Risk Reduction Plan	• Groundwater recharging • "Low/No Regrets[5]" infrastructure upgrades and repair (e.g. groundwater recharge/ impoundment areas) • Add water harvesting conservation structures
Constrained availability of surface water				• Add source reinforcement inputs;
Water shortages			• Water management plan • Water conservation and awareness program • Rainwater harvesting, groundwater recharge and improved infiltration	• Minimize system leaks and other water loss (e.g. surface reservoir evaporation) • Expanded or new reservoir capacity • "Low/No Regrets" infrastructure upgrades and repair (e.g. reservoirs, water supply network) • Community awareness generation to
Increased riparian flooding and erosion		• Flood risk prediction and mapping	• Rehabilitate urban wetlands and floodplains • Upstream rehabilitation of ecosystems	• "Low/No Regrets" infrastructure upgrades and repair (e.g. dikes, diversion channels, reservoirs) • Climate proofing vulnerable infrastructure in flood hazard areas (e.g. water, power, medical facilities)
Increased coastal flooding and	• Improved,	• Coastal	• Early warning system	• "Low/No Regrets"

[5] "Low-regret" or "No-regret" options that yield benefits even in absence of climate change and where the costs of the adaptation are relatively low vis-à-vis the benefits of acting; while "Win-Win" options that have the desired result in terms of minimising climate risks or exploiting potential opportunities but also have other social, environmental or economic benefits.

Climate Change Impact	Policies/ Regulation	Research Studies	ULB Level Plans and Programs/ Campaigns	Sub-Project Actions
erosion	"climate safe" building codes for new development	flooding risk prediction and mapping	and evacuation plan for disaster events • Rehabilitation/protection of coastal ecosystems (dunes, mangroves)	infrastructure upgrades and repair (e.g. dikes, diversion channels, reservoirs) • Climate proofing vulnerable infrastructure in hazard areas (e.g., water, power, medical facilities)
Damage to infrastructure	• Improved, "climate safe" building codes for new development and renovations	• Risk prediction and mapping		• Climate proofing vulnerable infrastructure (e.g., Intake works, Storage reservoirs, Pumping stations, Treatment Plants, etc.)
More favourable breeding grounds for pathogens due contribution to the quantity of wastewater and resultant pools and puddles.			• Health promotion activities (e.g., awareness program, community clean-up campaigns of drainage systems and other breeding grounds) • Improved training in health sector • Improved health infrastructure	• Take up Septage Management Improvement actions.

5.7.3 SAPCC for Andhra Pradesh

The SAPCC for AP 2012 detailed the key sectoral issues and concerns, and intervention strategies as below:

Key Sectoral Issues and Concerns

- Increasing energy use in the urban areas due to the changing pattern of urban livelihood
- Increasing average temperature/extended summer every year
- Drainage of the cities not adequate to accommodate the precipitations during the heavy rains
- Demand on water resources due to the growth in the urban population and therefore increased pressure on the water supply infrastructure
- Consequent generation of large quantity of sewage
- Generation of huge quantum of solid waste
- Increased threat to urban health due to vector borne diseases
- Increased private transportation leading to huge pressure on the road infrastructure and the increased emissions

Interventions and Strategies

- **Safe water supply as per norms to the entire urban population (projected population of 2022)**

- **100% coverage of sewerage and sanitation for the urban population (projected as of 2022)**
- **Study and remodel existing water supply, sanitation and sewerage systems to reduce climate change vulnerability**
- Protection and restoration of existing water bodies in urban areas
- Creation of new water bodies in urban areas
- Scientific management of municipal solid waste in all municipalities and corporations (population and number of municipalities projected as of 2022)
- Restoring efficiency of drainage network of all municipalities to enable quick evacuation of water and to avoid flooding
- Enforce spatial planning in cities and towns to reduce vehicular movement
- **Mandatory rainwater harvesting in Government buildings, commercial establishments, offices, schools/colleges, academic/research establishments and industrial units**
- Policy and incentives for rooftop solar power generation and provision of grid connectivity
- Rail based MRTS in emerging cities and expansion of existing MRTS
- Provision of safe footpaths, cycle tracks, etc. to promote non-motorised transport
- Recovery of phosphates nitrates etc., from wastewater

5.7.4 Suggested Framework for Climate Consideration

To start with the APUWSSMIP need to do adapt the relevant sector specific policies/ practices listed below.

Table 5-5: Framework for Climate Consideration

Sector/ Issue	Policies/ practices to be adapted
Buildings	Reduction of energy and water consumption in new and existing homes, businesses and public buildings; incentives for green building; resilience to adverse weather (such as heat and flooding).
Energy	Demand management (domestic and business); renewable energy generation; distributed energy systems; resilience of infrastructure; emergency plans for supply disruption.
Waste	Reducing, reusing and recycling waste; waste to energy; resilience of landfills to natural disasters.
Water	**Demand management (domestic and business); water reuse and recycling; resilience of infrastructure; energy efficient water treatment; emergency plans for supply disruption.**
Health	Water quality improvement measures, including reductions of short lived climate pollutants; heat wave (or cold snap) health action plans; prevention of spread of diseases affected by climate change and due to wastewater
Energy Efficiency	Applies to various sectors, including buildings and basic urban services and pumping stations.

Once the ULBs adapt these, the design consultants need to incorporate these into the design of infrastructure and the supervision consultants needs to ensure that these are followed by the contractors and implemented.

6 Environment and Social Management Planning Framework

6.1 Introduction

The Environmental and Social Management Framework is prepared since the exact nature and magnitude of the project's impacts, to be implemented in 50 ULBs, is not known presently. Hence, this Framework provides a broad outline of a range of impacts that can occur while implementing the projects. Some of these impacts will be in the domain of environment and some will involve the people in the project area or its catchment areas. The previous chapter has outlined a broad list of impacts, that are certain to occur and a list of risks, which are uncertain. The Framework approach encompasses all possibilities identified during the assessment. Accordingly, a mitigation plan has been developed corresponding to all risks and impacts identified.

It has been pointed out that the environmental impacts are localized, reversible and temporary in nature. A comprehensive Environmental Management Plan (EMP) is required to manage the construction related environmental impacts. The key issue regarding environmental impacts is the water source for the water supply schemes. It has been suggested that a Sustainability Assessment is conducted to ensure that the selected source is sustainable and will be able to survive throughout the design life of the project. This assessment needs to consider the performance of the source for the last 15 years in terms of regular availability, competing uses, etc. This detailed assessment needs to be incorporated in the Detailed Project Report.

The social impacts are more prominent; any land securing that may involve displacement of the population (titleholders, encroachers or squatters) will have considerable impacts, not only from the perspective of resettlement but also for restoration of livelihoods. Moreover, if the ULB lies in a Scheduled Area or the project area has any Tribal population, then the provisions of the Tribal People's Planning Framework will be applicable.

6.2 How to use the ESMPF

The ESMPF is based on the outputs of the Social and Environmental Assessment that was carried out during the APUWSSMIP preparation. The assessment included secondary information research, primary visits to 5 towns, public/ stakeholder consultations, and analysis to determine the key social and environmental issues. All the information, analyses and feedback have been suitably incorporated in the ESMPF. Since the project is categorized as Category A, the ESMPF prescribes following:

a) Screening and review process for identification of sensitive sub-projects with respect to environmental and social issues will be carried out during the planning phase of the sub-project. An Environmental and Social Data (ESD) format is annexed. ***(Annexure 1).*** This exercise is aimed at finding, if the sub-project requires environmental clearance and obtain the same, if required.
b) Conducting EIA and SIA for each of the sub-projects

c) Development of specific EMP and SMP (with the generic EMP and SMP as a guidance) for each of the sub-projects and preparation of RAP/ ARAP if required
d) Preparation of Tribal Population Plan (TPP) when the sub-project is located in the Scheduled Tribes area or when the ULB has substantial ST population.
e) Monitoring Protocol for regular monitoring
f) Half-yearly independent third party environmental and social audit.

6.2.1 Environmental Clearance from MoEF

The Framework for Environmental Clearance of the MoEF is currently in the draft stage and later in case the MoEF brings the water supply projects under purview of Environmental Clearance under that condition the environmental clearances may be required as per the suggested guidelines of the MoEF. At this stage it would be difficult to state whether the Environmental clearance would be required for all sub-projects under APUWSSMIP. However, following clearances would be mandatorily required prior to initiation of any construction activity.

- Consent to Establish from SPCB for batching plants, etc.
- Forest Clearance – in case the water supply network passes through designated protected or reserve forest areas
- Permissions for tree cutting
- Approval/ Clearance from the respective Engineering departments responsible for maintaining municipal roads and in case the network crosses village roads then from the PRED and in case of other roads/ railways from respective departments/ agencies.
- Approvals for water drawl from source

It is therefore suggested that the steps involved in obtaining the environmental clearance may be duly followed and all reports and documents be prepared as per the requirements for obtaining environmental clearance from the concerned state (SEAC - GoAP) or central level authorities (EAC - MoEF) to avoid or minimize any inconvenience or disruption arising due to stoppages of work resulting from pending clearances.

6.3 Environmental Impact Assessment

This guidance outlines the following to be taken care of while conducting environmental impact assessment of each sub-project:

- Source sustainability measures
- Source protection measures
- Impacts and mitigation measures related to site clearance, planning and development
- Impacts and mitigation related to water supply management
- Impacts and mitigation measures related to transport, vehicles and equipment; such as air, water and soil pollution
- Impacts and mitigation measures related to construction works and related wastes, both solid and liquid

- Impacts and mitigation measures related to labour camps
- Energy conservation measures
- Measures related to changes in climate
- Other mandatory requirements to be followed
- Other clearances and approvals

This EIA needs to be conducted by the Design Consultants (DPR Consultants). The EIA/EMP report must be an annexed to the DPR.

6.4 Broad Framework

The Government of India enacted Environment Protection Act, in 1986. The process of Environmental Impact Assessment was made mandatory in 1994 under the provisions of the Act.

6.5 Stages of EIA

The EIA process depends upon the requirements of the MoEF and the AIIB. However, most EIA processes have a common structure and the application this basic standard is a good practice. A Terms of Reference to conduct EIA is annexed. (***Annexure 2***)

The environment impact assessment consists of eight steps with each step equally important in determining the overall performance of the project. The eight steps of the EIA process are presented in brief below:

a. **Screening:** Determines whether the proposed project, requires an EIA and if it does, then the level of assessment required. The basic objective of screening is to ensure that it neither entails excessive review nor overlooks proposals that warrant examination. Hence, a significantly important thing to mention at this juncture is that all proposals; that are below the investment or other thresholds mentioned in the EIA Notification and warrant clearance from MoEF, are exempted from the MoEF clearance requirements.
b. **Scoping:** Identifies the key issues and impacts that should be further investigated. This stage also defines the boundary and time limit of the study.
c. **Impact analysis:** Identifies and predicts the specific environmental and social impacts of the proposed project and evaluates the significance.
d. **Mitigation:** Recommends the actions to reduce and avoid the potential adverse environmental consequences of development activities.
e. **Reporting:** The result of EIA is presented in the form of a report to the decision-making body and other interested parties.
f. **Review of EIA:** Examines the adequacy and effectiveness of the EIA report and provides the information necessary for decision-making.
g. **Decision-making:** Decides whether the project is rejected, approved or needs further change.
h. **Post Implementation Monitoring:** This stage comes into play once the project is commissioned. It checks to ensure that the impacts of the project do not

exceed the legal standards and implementation of the mitigation measures are in the manner as described in the EIA report.

6.5.1 Screening

Screening is the process of deciding on whether an EIA is required. This may be determined by size (eg. greater than a predetermined area of irrigated land that would be affected, more than a certain percentage or flow to be diverted or more than a certain capital expenditure or more than a certain quantity of water drawn). The output from the screening process is often a document called an **Initial Environmental Examination or Evaluation** (IEE). The main conclusion will be a classification of the project according to its likely environmental sensitivity. This will determine whether an EIA is needed and if so to what detail. The projects requiring an Environmental Impact Assessment report shall be termed Category 'B1' and remaining projects shall be termed Category 'B2' and will not require an Environment Impact Assessment report. However, for all sub-projects under the APUWSSMIP, an EIA will be carried out by the PMC as soon as they are commissioned and before the tendering of the sub-project.

6.5.2 Scoping

Scoping is a process of detailing the terms of reference of EIA. It has to be done by the consultant in consultation with the project proponent. "Scoping" refers to the process of determining the detailed and comprehensive Terms Of Reference (TOR) addressing all relevant environmental concerns for the preparation of an Environment Impact Assessment (EIA) Report.

6.5.3 Baseline Data

Quantifiable impacts are to be assessed on the basis of magnitude, prevalence, frequency and duration and non-quantifiable impacts (such as aesthetic or recreational value), significance is commonly determined through the socio-economic criteria. After the areas, where the project could have significant impact, are identified, the baseline status of these should be monitored and then the likely changes in these on account of the construction and operation of the proposed project should be predicted. Baseline data describes the existing environmental status of the identified study area. The site-specific primary data should be monitored for the identified parameters and supplemented by secondary data if available. The baseline parameters to be monitored are air (changes in ambient air quality), noise (changes in noise levels), water (water quality), land (land alienation and loss of livelihoods, etc.), biological (tree cutting, contamination, water quality, etc.) and socio-economic (demographic, economic, health, etc.).

6.5.4 Impact Prediction

Impact prediction is a way of mapping the environmental consequences of the significant aspects of the project and its alternatives. The following impacts of the project should be assessed:

6.5.4.1 Air

- changes in ambient levels and ground level concentrations due to total emissions from point, line and area sources
- effects on soils, materials, vegetation, and human health

6.5.4.2 Noise

- changes in ambient levels due to noise generated from equipment and movement of vehicles
- effect on fauna and human health

6.5.4.3 Water

- availability to competing users
- sustainability of quantity – past data for last 15 years
- changes in quality
- sediment transport
- ingress of saline water

6.5.4.4 Land

- changes in land use and drainage pattern
- changes in land quality including effects of waste disposal
- changes in shoreline/ riverbank and their stability
- land alienation and loss of livelihoods

6.5.4.5 Biological

- deforestation/ tree-cutting and shrinkage of animal habitat.
- impact on fauna and flora (including aquatic species if any) due to contaminants/ pollutants
- Impact on rare and endangered species, endemic species, and migratory path/ route of animals.
- Impact on breeding and nesting grounds
- contamination

6.5.4.6 Socio-Economic

- Impact on the local community including demographic changes.
- Impact on economic status
- Impact on human health.
- Impact of increased traffic

6.5.5 Assessment of Alternatives

For every project, possible alternatives should be identified, and environmental attributes compared. Alternatives should cover both project location and process technologies. Alternatives should consider no project option also. Alternatives should then be ranked for selection of the best environmental option for optimum economic benefits to the community at large. Once alternatives have been reviewed, a mitigation plan should be drawn up for the selected option and is supplemented with an Environmental Management Plan (EMP) to guide the proponent towards environmental improvements. The EMP is a crucial input to monitoring the clearance conditions and therefore details of monitoring should be included in the EMP. An EIA report should provide clear information to the decision-maker on the different environmental scenarios without the project, with the project and with project alternatives. Uncertainties should be clearly reflected in the EIA report.

6.5.6 Public Hearing/ Consultations

Law requires that the public must be informed and consulted on a proposed development after the completion of EIA report. Any one likely to be affected by the proposed project is entitled to have access to the executive summary and full report of the EIA. The affected persons may include:

- bonafide local residents
- local associations
- environmental groups: active in the area
- any other person located at the project site/ sites of displacement

They are to be given an opportunity to make oral/ written suggestions to the State Pollution Control Board.

6.5.7 Monitoring the Clearance

Monitoring should be done during both construction and operation phases of a project. This is not only to ensure that the commitments made are complied with but also to observe whether the predictions made in the EIA reports were correct or not. Where the impacts exceed the predicted levels, corrective action should be taken. Monitoring will enable the regulatory agency to review the validity of predictions and the conditions of implementation of the Environmental Management Plan (EMP).

6.6 Components of EIA

The EIA require inclusion/ coverage of all significant environmental impacts and their mitigation. Depending on nature, location and scale of the project, EIA report should contain all or some of the following components.

6.6.1 Air Environment

- Determination of impact zone (through a screening model) and developing a monitoring network
- Monitoring the existing status of ambient air quality within the impacted region (7-10 km from the periphery) of the proposed project site
- Monitoring the site-specific meteorological data, viz. wind speed and direction, humidity, ambient temperature and environmental lapse rate
- Estimation of quantities of air emissions including fugitive emissions from the proposed project
- Identification, quantification and evaluation of other potential emissions (including those of vehicular traffic) within the impact zone and estimation of cumulative of all the emissions/impacts
- Prediction of changes in the ambient air quality due to point, line and areas source emissions through appropriate air quality models
- Evaluation of the adequacy of the proposed pollution control devices to meet gaseous emission and ambient air quality standards
- Delineation of mitigation measures at source, path ways and receptor.

6.6.2 Noise Environment

- Monitoring the present status of noise levels within the impact zone, and prediction of future noise levels resulting from the proposed project and related activities including increase in vehicular movement
- Identification of impacts due to any anticipated rise in noise levels on the surrounding environment
- Recommendations on mitigation measures for noise pollution

6.6.3 Water Environment

- Study of existing ground and surface water resources with respect to quantity and quality within the impact zone of the proposed project. The EIA must a) establish the source sustainability by taking into account the past data, b) test the water and suggest the appropriate treatment to make it potable and c) provide for a mechanism to check water quality during operation and maintenance on a regular basis.
- Prediction of impacts on water resources due to the proposed water use/pumping on account of the project
- Quantification and characterisation of waste water including toxic organic, from the proposed activity
- Evaluation of the proposed pollution prevention and wastewater treatment system and suggestions on modification, if required
- Prediction of impacts of effluent discharge on the quality of the receiving water body using appropriate mathematical/simulation models
- Assessment of the feasibility of water recycling and reuse and delineation of detailed plan in this regard

6.6.4 Biological Environment

- Survey of flora and fauna clearly delineating season and duration.
- Assessment of flora and fauna present within the impact zone of the project
- Assessment of potential damage to terrestrial and aquatic flora and fauna due to discharge of effluents and gaseous emissions from the project
- Assessment of damage to terrestrial flora and fauna due to air pollution, and land use and landscape changes
- Assessment of damage to aquatic and marine flora and fauna (including commercial fishing) due to physical disturbances and alterations
- Prediction of biological stresses within the impact zone of the proposed project
- Delineation of mitigation measures to prevent and / or reduce the damage.

6.6.5 Land Environment

- Studies on soil characteristics, existing land use and topography, landscape and drainage patterns within the impact zone
- Estimation of impacts of project on land use, landscape, topography, drainage and hydrology

- Identification of potential utility of treated effluent in land application and subsequent impacts
- Estimation and Characterisation of solid wastes and delineation of management options for minimisation of waste and environmentally compatible disposal

6.6.6 Socio-economic and Health Environment

- Collection of demographic and related socio-economic data
- Collection of epidemiological data, including studies on prominent endemic diseases (e.g. fluorosis, malaria, fileria, malnutrition) and morbidity rates among the population within the impact zone
- Projection of anticipated changes in the socio-economic and health due to the project and related activities including traffic congestion and delineation of measures to minimise adverse impacts
- Assessment of impact on significant historical, cultural and archaeological sites/places in the area
- Assessment of economic benefits arising out of the project
- Assessment of rehabilitation requirements with special emphasis on scheduled areas, if any.

6.6.7 Risk Assessment

Hazard identification, inventory analysis, Natural Hazard Probability etc.

- Maximum Credible Accident (MCA) analysis to identify potential hazardous scenarios
- Consequence analysis of failures and accidents resulting in fire, explosion, hazardous releases, dam breaks, etc.
- Hazard & Operability (HAZOP) studies
- Assessment of risk on the basis of the above evaluations
- Preparation of an onsite and off-site (project affected area) Disaster Management Plan

6.6.8 Environment Management Plan

- Delineation of mitigation measures including prevention and control for each environmental component and resettlement and rehabilitation plan.
- Delineation of monitoring scheme for compliance of conditions
- Delineation of implementation plan including scheduling and resource allocation

6.7 Roles in the EIA Process

EIA involves many parties, grouped by their role definition within the process. The following section outlines the basic responsibilities of various bodies:

- The Project Proponent - APUFIDC
- The Design Consultants (preparing the Detailed Project Reports will conduct the EIA) will act as Environmental Consultants
- The State Pollution Control Board/ Pollution Control Committees (PCCs)
- The General Public

- The Impact Assessment Agency

6.7.1 The Role of the Project Proponent

The project proponent during the project planning stage decides the type of projects i.e. new establishment, expansion or modernisation. Later the project proponent needs to prepare the Detailed Project Report/Feasibility Report and submits the Executive Summary, which shall incorporate the project details, and findings of EIA study, which is to be made available to concerned public.

The proponent has to approach the concerned SPCB for NOC and holding the public hearing. After the public hearing the proponent submits application to IAA for environmental clearance.

6.7.2 Role of Environmental Consultants - DRP Consultants

Environmental consultant should be conversant with the existing legal and procedural requirements of obtaining environmental clearance for proposed project. The consultant should guide the proponent through initial screening of the project and establish whether EIA studies are required to be conducted and if so finalise the scope of such study. The consultant should also be fully equipped with required instruments and infrastructure for conducting EIA studies. The environmental consultant is responsible for supplying all the environment-related information required by the SPCB and IAA through the proponent. The consultant is also required to justify the findings in the EIA and EMP during the meeting with the expert groups at IAA.

6.7.3 State Pollution Control Board (PCB) /Pollution Control Committee (PCC)

The State PCBs/PCCs are responsible for assessing the compatibility of a proposed development with current operational and prescribed standards. If the development is in compliance, the PCB will then issue its NOC. They shall also hold the public hearing as per the provisions of EIA notification. The details of public hearing shall be forwarded to IAA.

6.7.4 The Role of the General Public

The public also has an important role to play in EIA. The concerned persons will be invited through press advertisement to review information and provide their views on the proposed development requiring environmental clearance.

6.7.5 The Role of the Impact Assessment Agency (IAA)

Where a proponent is required to obtain environmental clearance, the IAA will evaluate and assess the EIA report. In this process the project proponent will be given a chance to present his proposal. If a project is accepted the IAA will also prepare a set of recommendations and conditions for its implementation based on this assessment. Environmental clearance conditions and recommendations of IAA are made available to the public on request through SPCB and through web site at http://envfor.nic.in. During

the implementation and operation of the project, the IAA will also be responsible for the environmental monitoring process.

6.7.6 Procedures for Implementing the EIA at the ULB level:

At the ULB level an EMP (Environment Management Plan) needs to be prepared. This will be prepared by the Design Consultants who prepares the DPR. This EMP will form an annexure to the DPR. The broad framework of the generic ESMP (Environmental and Social Management Plan) may be used as a reference. The EMP should have activities identified separately for (1) construction phase and (2) operations phase. The key issues that need to be addressed in the EMP for Construction Phase are:

1. A Sustainability Assessment of the source
2. Conduct survey along the alignment of the water transmission line to understand
    - Impact on the community in terms of restriction of access
    - Impact on community in terms of loss of livelihoods
3. Collect all necessary permits (example: batching plant, etc.) from the PCB related to construction
4. Take necessary actions for air, water, noise quality monitoring in multiple locations (identify the locations)
5. Coordination with multiple agencies if facilities of other Departments are likely to be affected (example: Post and Telegraph, Roads, Railways, etc.)
6. Coordination with Forest Department to ensure that re-plantation for felled trees

In the Operations Phase, the key issues for review and monitoring would be related to project performance, in this case the adequacy and quality of water supply.

6.8 Social Impact Assessment

In general, when and EIA is done to fulfil the requirements of MoEF, SIA becomes part of the EIA. But however, for the purposes of APUWSSMIP, the SIA has to be done separately. A separate agency will be engaged to conduct the SIA. This involves the following:

- Conducting an SIA
- Preparing an SMP
- Preparing a RAP/ ARAP, if required
- Preparing a TPP, if required

6.8.1 Conducting SIA

The Key Objective of the Social Assessment is to understand and address social development issues, and ensure accomplishing the outcomes in terms of inclusion, cohesion, equity, security and accountability. A separate agency/NGO will be engaged to conduct the SIA. The Objectives of the SIA are, a) Identifying and conducting a detailed stakeholder analysis, b) Assessing the social risks and impacts of the proposed sub-project interventions, c) Developing measures to mitigate risks and negative impacts and

enhance positive impacts, etc. This includes 1) Stakeholder analysis, 2) Social impacts, 3) Risks analysis and 4) Mitigation/ Management Measures. The following needs special care during the SIA. An agency will be

- **Stakeholder Analyses:** This includes identifying stakeholders at different levels, mapping Key Expectations, Impacts, Issues and Concerns as related to each stakeholder subgroups thereof.
- **Impact Assessment:** This involves, identifying positive and negative social impacts likely to occur for different stakeholder sub-groups or beneficiaries as a result of project interventions, assessing and prioritizing impacts based on their significance and suggesting measures to minimize negative impacts and derive the maximum from positive impacts.
- **Analysis and Assessment of Risks:** From ascertaining and analyzing the key social risks, internal and external, to the project, measures to address them are to be developed.
- **Gender:** This involves identifying any potentially adverse gender-specific impacts of the Project, and develop mitigation measures to reduce these. Where relevant, they will use gender disaggregated data and analysis, and consider enhancing the design of the Project to promote equality of opportunity and women's socioeconomic empowerment, particularly with respect to provision of services and employment. This includes an assessment of the socio-economic profile of women and young girls to understand how the project will benefit this section of the population. The output needs to include suggestion for monitoring the benefits that are expected to be accruing to the women and young girls.
- **Vulnerable Groups:** This involves ide notification of risks to and impacts on vulnerable groups and measures for their mitigation.

6.8.2 Key Tasks of SIA

While conducting the SIA the following tasks need to be performed:

- Consultations and discussion with all stakeholders relevant for the project to consider their views and concerns on social impacts and risks;
- Identification of all affected families, assets and Common Property Resources
- Census survey of all affected families in all sub-project component areas/villages concerning urban water supply project; recording their assets (land, structures and facilities), incomes, and social category (Scheduled Castes/Scheduled Tribes);
- Base line socio-economic survey of affected families suffering major impacts and needing rehabilitation assistance in addition to compensation to their losses.
- SIA involves analyzing social issues and impacts on affected populations and tribal people, which helps design Social Management Plans to mitigate adverse impacts and enhance positive impacts through participatory implementation.
- Prepare a vendor management strategy for the vendors to be affected.

- Record and analyze people's perception of the project, its adverse impacts, and minimum acceptable mitigation measures (relocation options, assistance offered) that will enable them to cope with displacement or loss of livelihoods.
- Identify measures and strategies for adverse impact mitigation and social value addition in order to optimize development outcomes of the project in the ULB.
- Analysis of existing local level Grievance Redress Mechanism (GRM) and based on the findings, recommended an appropriate GRM for the project.

6.8.3 Resettlement Action Plan and Tribal Peoples Plan, if required

Based on the findings of SIA a Resettlement Action Plan and/ or Tribal People Plan, if required should be developed. The SIA consultant should coordinate with DPR consultants, PHMED Engineers and ULB officials while finalizing the Resettlement Action Plan (RAP). The RAP and TPP should be prepared by consolidating SIA findings in line with Resettlement Policy Framework (RPF) & Tribal People Planning Framework (TPPF) listing R&R measures for different PAP categories including relocation site plans, analysis of socio-economic data, livelihood restoration measures, post-location support strategy, institutional R&R implementation, monitoring, grievance redress; strategies for capacity building, consultation, documentation, information dissemination, and disclosure; time frame for completing various land acquisition and R&R activities; and budget and costs. The RAP should outline support strategy during various stages of the implementation period and incorporate elements as per guidelines developed as part of RPF. The TPP should be prepared to address specific impacts on the tribal communities, if any affected. Separate consultations with women as needed should be organized and documented. The draft plans should be presented to seek suggestions or objections on SMP, RAP & TPP. The minutes and participants list should be documented.

6.9 Other ESMPF Actions

The following chapters of this ESMPF details the actions to be taken for each of the sub-projects under APUWSSMIP. As mentioned before the RPF and TPPF are part of this ESMPF.

7 Environment and Social Impact Mitigation Plan

7.1 Introduction

The primary objective of the environmental and Social management plan (ESMP) is to record likely environmental and social impacts resulting from the sub-project activities and to ensure implementation of the identified "mitigation measures", in order to reduce adverse impacts and enhance positive impacts. Besides, it would also address any unexpected or unforeseen environmental and social impacts that may arise during construction and operational phases of the sub-projects.

The ESMP clearly lays out:

a) the measures to be taken during both construction and operation phases of a sub-project to eliminate or offset adverse environmental and social impacts, or reduce them to acceptable levels;
b) the actions needed to implement these measures; and
c) a monitoring plan to assess the effectiveness of the mitigation measures employed.

The environmental and social management program should be carried out as an integrated part of the project planning and execution. For all sub-projects to be implemented under APUWSSMIP, the EMP for contractors as annexed to this document shall form the part of the Contract Document. The EMP for tender documents is annexed at ***Annexure 8***

7.2 Mitigation Measures

The "overall impact assessment" of the proposed sub-projects to be implemented, reveals that most of the adverse impacts could be minimized or eliminated by adopting standard mitigation measures. This section describes the standard mitigation measures that could be applied to the sub-projects under APUWSSMIP. In order to identify mitigation/ enhancement measures, the potential impacts have been categorized into: (a) "general impacts", which are typical common impacts to be experienced in most sub-projects, and (b) "sub-project specific impacts". The Table 7-1 shows typical activities to be carried out under different sub-projects, corresponding "general impacts" and suggested mitigation and enhancement measures. It also assigns responsibility for implementation of mitigation and enhancement measures. This is being referred to as Generic ESMP. This table provides general guidelines of mitigation and enhancement measures for the most significant "general impacts". The Sub-project specific impacts need to be identified during the EIA of the sub-project and a Sub-Project Specific EMP is prepared in line with the Generic ESMP and annexed to the Sub-Project DPR. This is done by the Design Consultants who prepares the DPR.

Table 7-1: Generic Environmental and Social Management Plan

S. No.	Issues/ Impacts	Mitigation Measures	Responsibility		
			Execution	Supervision	Monitoring
		Design Phase	Design Consultants	CMU	PMU
1.	Impacts due to increase in waste water and related health risks	▪ Awareness campaigns to be organized in order to prevent excessive use of water for household activities to reduce generation of excessive waste water ▪ Proper disposal of waste water in sewer drains. ▪ Waste water need to be treated and disposed-off at designated sites.	Contractor	CMU	PMU
2.	Testing of raw water	▪ The EIA consultants should test the raw water as required at the source and suggest appropriate treatment methods.	PMC	CMU	PMU
3.	Sustainability of Source	▪ The EIA consultants should do a sustainability analysis of the source by taking into account the past data of the source for at least last 10 to 15 years.	PMC	CMU	PMU
		Pre-construction Phase			
4.	Land Acquisition, Displacement, Encroachment, squatting and loss of livelihood	In case there are any impacts on; ▪ loss of agricultural land/ homestead/ commercial land; ▪ loss of assets or access to social, economic and other assets and ▪ loss of income sources of means of livelihood, whether or not the affected persons must move to another location; then follow the RPF for determining the entitlements.	PMU/ CMU	CMU/ PMC	PMU
5.	Utility Relocation and common property resources	▪ In case of utilities and common property resources being impacted due to the project, they will be relocated with prior approval of the concerned agencies, before construction starts. ▪ The relocation site identification will be in accordance with the choice of the community.	Contractor/ CMU	CMU PMC	PMU
6.	Relocation of Cultural Property	▪ In case there is an impact on cultural properties, they will be relocated to suitable locations, as desired by the community before construction starts. ▪ Local Community meetings, will be held to discuss relocation aspects, siting of structures etc.	Contractor	CMU PMC	PMU
7.	Tree Cutting	▪ Trees will generally not be removed unless they are a safety hazard. ▪ Removal of trees shall be done only after the permissions/approvals are obtained from concerned regulatory authorities. ▪ Disposal of cut trees is to be done immediately to ensure that the traffic movement is not disrupted.	Contractor	CMU PMC	PMU
8.	Site clearance	▪ Site clearance will be done only in the area required for the sub-project.	Contractor	CMU PMC	PMU

S. No.	Issues/ Impacts	Mitigation Measures	Responsibility		
			Execution	Supervision	Monitoring
9.	Debris disposal site identification	▪ Site for temporary storage and disposal of debris refuse to be identified in consultation with local Gram Panchayat / Municipality. ▪ These disposal sites shall be finalized such that they are not located within any designated forest or other eco-sensitive areas, does not impact natural drainage courses and no endangered/ rare flora is impacted by such disposal. ▪ Pre-designated sites for disposal could be used with prior permission from CMU.	Contractor	CMU PMC	PMU
10.	Joint Field Verification	▪ The Engineer and the Contractor will carry out joint field verification of the EMP. ▪ The efficacy of the mitigation measures suggested in the EMP will be checked.	Contractor	CMU PMC	PMU
11.	Modification of the Contract Documents	▪ If required, the Engineer will modify the EMP and Contract documents (particularly the BOQs) with consent from Environmental and Social Specialists.	Contractor	CMU PMC	PMU
12.	Crushers, Drum-mix plants & Batching Plants	▪ Specifications for batching plants (existing or new) will comply with the requirements of the relevant national, state and local pollution control requirements as per Environment Protection Act 1986, Air (Prevention and Control of Pollution) Act, 1981 and Noise Pollution (Regulation and Control) Rules, 2000. ▪ Batching plants will be sited sufficiently away from habitation, agricultural operations or industrial establishments. ▪ Such plants will be located at least 1000 m away from the nearest habitation, preferably in the downwind direction.	Contractor	CMU PMC	PMU
13.	Other Construction Vehicles, Equipment and Machinery	▪ The discharge standards promulgated under the Environment Protection Act, 1986 will be strictly adhered to. ▪ All vehicles, equipment and machinery to be procured for construction will conform to the relevant Bureau of Indian Standard (BIS) norms. ▪ Noise limits for construction equipment to be procured such as compactors, rollers, front loaders, concrete mixers, cranes (moveable), vibrators and saws will not exceed 75 dB (A), measured at one meter from the edge of the equipment in free field, as specified in the Environment (Protection) Rules, 1986.	Contractor	CMU PMC	PMU
14.	Material sourcing (sand, borrow material and stone material)	▪ Procurement of construction material only from permitted sites and licensed/ authorized quarries. ▪ Farm land and forest belts shall not be used for material sourcing or borrow sites. ▪ Arable land shall not be selected as borrow sites as much as possible. ▪ If excavation has to be done in arable land, top soil layer (30 cm) shall be saved and returned after construction work is completed, so as to minimize impacts.	Contractor	CMU PMC	PMU

S. No.	Issues/ Impacts	Mitigation Measures	Responsibility		
			Execution	Supervision	Monitoring
15.	Quarries	▪ The Contractor will identify materials from existing licensed quarries with the suitable materials for construction. ▪ Apart from approval of the quality of the quarry materials, the Engineer's representative will verify the legal status of the quarry operation. ▪ The quarry operations will be undertaken within the rules and regulations in force.	Contractor	CMU PMC	PMU
16.	Water for construction	▪ The Contractor will be responsible for arranging adequate supply of water for the entire construction period. ▪ The contractor shall consult the local people before finalizing the locations. ▪ The contractor will preferentially source all water requirements from surface water bodies. ▪ The contractor will be allowed to pump only from the surface water bodies. ▪ Boring of any tube wells will be prohibited. ▪ Any groundwater to be extracted requires permission from concerned authorities and PMU. ▪ The contractor will minimize wastage of water during construction.	Contractor	CMU PMC	PMU
17.	Sand	The contractor will identify sand quarries with requisite approvals for the extraction of sand from Department of Mines and Geology as per The Mines and Minerals (Development and Regulation) Act, 1957 and AP Minor Mineral Concession rules, 1966	Contractor	CMU PMC	PMU
		Mobilization Phase			
18.	Labour Requirements	▪ The contractor will use unskilled labour drawn from local communities to avoid any additional stress on the existing facilities (medical services, power, water supply, etc.) ▪ Planning of labour camps, if required, needs to be done to ensure adequate water supply, sanitation and drainage etc., in conformity with the "The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996"	Contractor	CMU PMC	PMU
		Construction			
19.	Generation of Debris during construction	▪ Debris generated during construction shall be suitably reused as back-fill material, subject to the suitability of the material and the approval of the Engineer. ▪ The contractor shall suitably dispose unutilized debris material at pre-designated dump locations, subject to the approval of the Engineer. ▪ Debris generated from pile driving or other construction activities shall be disposed such that it does not flow into the surface water bodies or form mud puddles in the area. ▪ Dumping sites shall be identified by the contractor as per regulations in force. The identified locations will be reported to the Engineer.	Contractor	CMU PMC	PMU
20.	Construction waste disposal	▪ Location of disposal sites will be finalized prior to beginning of construction ▪ The Engineer shall approve these disposal sites conforming to the following	Contractor	CMU PMC	PMU

S. No.	Issues/ Impacts	Mitigation Measures	Responsibility		
			Execution	Supervision	Monitoring
		▪ (a) These are not located within designated forest areas. ▪ (b) The dumping does not impact natural drainage courses ▪ (c) No endangered/rare flora is impacted by such dumping. ▪ (d) Settlements are located at least 1.0km away from the site. ▪ (e) Not located 1 Km within any mangrove vegetation/ecologically sensitive areas.			
21.	Blasting	▪ Except as may be provided in the contract or ordered or authorized by the Engineer, the Contractor will not use explosives. ▪ Where the use of explosives is so provided or ordered or authorized, the Contractor will comply with the requirements of the regulations in force besides the law of the land as applicable. ▪ The Contractor will at all times take every possible precaution and will comply with appropriate laws and regulations relating to the importation, handling, transportation, storage and use of explosives and will, at all times when engaged in blasting operations, post sufficient warning flagmen, to the full satisfaction of the Engineer. ▪ The Contractor will at all times make full liaison with and inform well in advance and obtain such permission as is required from all Government Authorities, public bodies and private parties whomsoever concerned or affected or likely to be concerned or affected by blasting operations. ▪ Blasting shall be carried out with prior information to the Engineer and only after obtaining permission from the District Police authorities (Superintendent of Police) . ▪ All the statutory laws, regulations, rules etc., pertaining to acquisition, transport, storage, handling and use of explosives will be strictly followed. ▪ Blasting will be carried out during fixed hours (preferably during mid-day), as permitted by the Authorities / Engineer. ▪ The timing should be made known to all the people within 1000 m (200 m for pre-splitting) from the blasting site in all directions.	Contractor	CMU PMC	PMU
22.	Transporting Construction Materials	▪ All existing highways and roads used by vehicles of the contractor, or suppliers of materials will be kept clean and clear of all dust/mud or other extraneous materials dropped by such vehicles. ▪ The unloading of materials at construction sites close to settlements will be restricted to daytime only. ▪ For any unloading at night, written permission shall be obtained from the concerned authorities	Contractor	CMU PMC	PMU

S. No.	Issues/ Impacts	Mitigation Measures	Responsibility		
			Execution	Supervision	Monitoring
23.	Planning Traffic Diversions & Detours	▪ Temporary diversions will be constructed with the approval of the Engineer. Detailed Traffic Control Plans will be prepared and submitted to the Engineer for approval, 5 days prior to commencement of works on any section of road. ▪ Prior to creating diversions and detours the citizens should be consulted well in advance through citizen's meetings. ▪ The traffic control plans shall contain details of temporary diversions, details of arrangements for construction under traffic, details of traffic arrangement after cessation of work each day, safety measures for transport of hazardous material and arrangement of flagmen. ▪ Environmental personnel of the Contractor will assess the environmental impacts associated as the loss of vegetation, productive lands and the arrangement for temporary diversion of the land prior to the finalization of diversions and detours. ▪ Special consideration will be given to the preparation of the traffic control plan for safety of pedestrians and workers at night. ▪ The Contractor will ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. ▪ He shall inform local community of changes to traffic routes, conditions and pedestrian access arrangements. ▪ The temporary traffic detours will be kept free of dust by frequent application of water. ▪ Traffic controls and diversions marked with signs, lights and other measures (flags) should be provided. ▪ It should be an informed decision taken through public participation. Diversion works to be dismantled to restore the area to original condition after completion of construction.	Contractor	CMU PMC	PMU Experts of PMC
24.	Infrastructure provisions at construction camps	▪ The Contractor during the progress of work will provide, erect and maintain necessary (temporary) living accommodation and ancillary facilities for labour to standards and scales approved by the Engineer. ▪ There shall be provided within the precincts of every workplace, latrines and urinals in an accessible place, and the accommodation, separately for each for these, as per standards set by the Building and other Construction Workers (regulation of Employment and Conditions of Service) Act, 1996. ▪ Except in workplaces provided with water-flushed latrines connected with a water borne sewage system ready for use bio-toilets , all latrines shall be provided with dry-earth system (receptacles) which shall be cleaned at least four times daily and at least twice during working hours and kept in a strict sanitary condition. ▪ Receptacles shall be tarred inside and outside at least once a year.	Contractor	CMU PMC	PMU Experts of PMC

S. No.	Issues/ Impacts	Mitigation Measures	Responsibility		
			Execution	Supervision	Monitoring
		▪ If women are employed, separate latrines and urinals, screened from those for men (and marked in the vernacular) shall be provided. ▪ There shall be adequate supply of water, close to latrines and urinals. ▪ All temporary accommodation must be constructed and maintained in such a fashion that uncontaminated water is available for drinking, cooking and washing. ▪ The sewage system for the camp must be designed, built and operated so that no health hazard occurs and no pollution to the air, ground or adjacent watercourses takes place. Compliance with the relevant legislation must be strictly adhered to. ▪ Garbage bins must be provided in the camp shall be regularly emptied and the garbage disposed in a hygienic manner, In consultation with the local Gram Panchayats/ Municipalities, at designated sites. ▪ Separate bins shall be placed for kitchen waste, plastic waste, glass ware and metals duly labeling with stickers. ▪ Construction camps are to be sited at least 1000 m away from the nearest habitation and adequate health care is to be provided for the work force. ▪ Unless otherwise arranged for by the local sanitary authority, arrangement for disposal of excreta by putting a layer of night soils at the bottom of a permanent tank prepared for the purpose shall be taken up by the contractor. ▪ It should be covered with 15 cm layer of waste or refuse and then with a layer of earth for a fortnight (by then it will turn into manure).			
25.	Operation of construction equipment and vehicles	▪ All vehicles and equipment used for construction will be fitted with exhaust silencers. During routine servicing operations, the effectiveness of exhaust silencers will be checked and if found to be defective will be replaced. ▪ Noise limits for construction equipment used in this project (measured at one meter from the edge of the equipment in free field) such as compactors, rollers, front loaders, concrete mixers, cranes (moveable), vibrators and saws will not exceed 75 dB(A), as specified in the Environment (Protection) Rules, 1986 ▪ Notwithstanding any other conditions of contract, noise level from any item of plant(s) must comply with the relevant legislation for levels of noise emission. ▪ The contractor will ensure that the AAQ concentrations at these construction sites are within the acceptable limits of industrial uses in case of hot mix plants and crushers and residential uses around construction camps. ▪ Monitoring of the exhaust gases and noise levels will be carried out by the agency identified for Environmental Monitoring for the project.	Contractor	CMU PMC	PMU

S. No.	Issues/ Impacts	Mitigation Measures	Responsibility		
			Execution	Supervision	Monitoring
26.	Material Handling at Site	▪ All workers employed on cement, lime mortars, concrete etc., will be provided with protective footwear and protective goggles. ▪ Workers, who are engaged in welding works, would be provided with welder's protective eye-shields. ▪ Workers engaged in stone breaking activities will be provided with protective goggles and clothing and will be seated at sufficiently safe intervals. ▪ No person below the age of 14 years and no woman will be employed on the work of painting with products containing lead in any form as per The Child Labour (Prohibition and Regulation) Act of 1986. ▪ No paint containing lead or lead products will be used except in the form of paste or readymade paint. ▪ Face masks will be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint dry rubbed and scrapped.	Contractor	CMU PMC	PMU
27.	Precautionary/ Safety Measures During Construction	▪ All relevant provisions of the Factories Act, 1948 and the Building and other Construction Workers (regulation of Employment and Conditions of Service) Act, 1996 will be adhered to. ▪ Adequate safety measures for workers during handling of materials at site will be taken up. ▪ The contractor has to comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress.	Contractor	CMU PMC	PMU
28.	Protection of Religious Structures and Shrines	▪ All necessary and adequate care shall be taken to minimize impact on cultural properties (which includes cultural sites and remains, places of worship including temples, mosques, churches and shrines, etc., graveyards, monuments and any other important structures as identified during design and all properties/sites/remains notified under the Ancient Sites and Remains Act). ▪ No work shall spillover to these properties, premises and precincts. ▪ Access to such properties from the road shall be maintained clear and clean.	Contractor	CMU PMC	PMU
29.	Fugitive Dust Pollution near settlements	▪ Trucks carrying construction material to be adequately covered. ▪ All earthworks will be protected in a manner acceptable to the Engineer to minimize generation of dust. ▪ The contractor will take every precaution to reduce the level of dust along construction sites involving earthworks, by frequent application of water.	Contractor	CMU PMC	PMU

S. No.	Issues/ Impacts	Mitigation Measures	Responsibility		
			Execution	Supervision	Monitoring
30.	Earth work Excavations	▪ Ensure unobstructed natural drainage through proper drainage channels/structures. Dispose surplus excavated earth at identified sites. Ensure minimum hindrance to normal local activities and business. ▪ Avoid damage to permanent structures. ▪ All excavations will be done in such a manner that the suitable materials available from excavation are satisfactorily utilized as decided upon beforehand. ▪ The excavations shall conform to the lines, grades, side slopes and levels shown in the drawings or as directed by the engineer. ▪ While planning or executing excavation the contractor shall take all adequate precautions against soil erosion, water pollution etc. and take appropriate drainage measures to keep the site free of water, through use of mulches, grasses, slope drains and other devices. ▪ The contractor shall take adequate protective measures to see that excavation operations do not affect or damage adjoining structures and water bodies. ▪ For safety precautions guidance may be taken from IS:3764.	Contractor	CMU PMC	PMU
31.	Contamination of soil	▪ Vehicle/machinery and equipment operation, maintenance and refueling will be carried out in such a fashion that spillage of fuels and lubricants does not contaminate the ground. ▪ Oil interceptors will be provided for vehicle parking, wash down and refueling areas within the construction camps. ▪ Fuel storage will be in proper bunded areas. ▪ All spills and collected petroleum products will be disposed in accordance with MoEF and SPCB guidelines. ▪ Fuel storage and refilling areas will be located at least 1000 m from rivers and irrigation ponds or as directed by the Engineer. ▪ In all fuel storage and refueling areas, if located on agricultural land or areas supporting vegetation, the topsoil will be stripped, stockpiled and returned after cessation of such storage and refueling activities.	Contractor	CMU PMC	PMU
32.	Compaction of soil	▪ To minimize soil compaction construction vehicle, machinery and equipment will move or be stationed in designated area (RoW or CoI, haul roads as applicable) only. ▪ The haul roads for construction materials should be routed to avoid agricultural areas.	Contractor	CMU PMC	PMU
33.	Silting, Contamination of Water bodies	▪ Silt fencing will be provided around stockpiles at the construction sites close to water bodies. ▪ The fencing needs to be provided prior to commencement of earthworks and continue till the stabilization of the embankment slopes, on the particular sub-section of the road.	Contractor	CMU PMC	PMU

S. No.	Issues/ Impacts	Mitigation Measures	Responsibility		
			Execution	Supervision	Monitoring
		Construction materials containing fine particles will be stored in an enclosure such that sediment-laden water does not drain into nearby watercourses. ▪ All discharge standards promulgated under Environmental Protection Act, 1986, will be adhered to. ▪ All liquid wastes generated from the site will be disposed as acceptable to the Engineer.			
34.	Cutting/ Filling of Surface water bodies	▪ Earth works shall be undertaken such that the existing embankments of water bodies are not disturbed. In case of cutting of embankments, the same shall be reconstructed with appropriate slope protection measures and adequate erosion control measures. ▪ Filling of surface water bodies will be compensated by digging an equal volume of soil for water storage. ▪ Such dug-up soil will be used for spreading as topsoil. ▪ Wherever digging is undertaken, the banks will be protected as designed or as approved by the Engineer. ▪ The excavation will be carried out in a manner so that the side slopes are no steeper than 1 vertical to 4 horizontal, otherwise slope protection work, as approved by the Engineer will be provided. ▪ As far as practicable, and as approved by the Engineer, excavation for replacement of water bodies will be at the closest possible place/location, with respect to the original water body or part thereof consumed by filling.	Contractor	CMU PMC	PMU
35.	Surfacing	▪ The contractor will take all necessary means to ensure that all surfacing works and all associated operations are carried out in conformity with regulations. ▪ All workers employed on mixing asphaltic material etc. will be provided with protective footwear as specified. Noise levels from all vehicles and equipment used for surfacing will conform to standards as specified. ▪ Construction activities involving equipment with high noise levels will be restricted to the daytime. ▪ Transport of materials for construction will be as specified. The contractor will provide for all safety measures during construction as per regulations in force.	Contractor	CMU PMC	PMU
36.	Mitigation Measures for Noise Sensitive Receptors	▪ Noisy construction operations in residential and sensitive areas (hospitals, schools and religious places) should be restricted between 7.30 am to 6.00 pm to avoid disturbance to local community as per The Noise Pollution (Regulation and Control) Rules, 2000 ▪ Preventive maintenance of construction equipment and vehicles would be done to meet emission standards and to keep them with low noise. ▪ Provision of ear plugs to operators of heavy machinery and workers in near vicinity.	Contractor	CMU PMC	PMU

S. No.	Issues/ Impacts	Mitigation Measures	Responsibility		
			Execution	Supervision	Monitoring
		▪ During night, material transport should be uniformly distributed to minimize noise impacts.			
37.	Disposal of construction debris	▪ Daily inspection at haul roads and sites for construction debris for safe collection and disposal to land fill sites. Collection and disposal of refuse. ▪ Minimize construction debris by balancing cut and fill requirements, if relevant.	Contractor	CMU PMC	PMU
38.	Adjoining water bodies	▪ Provide slope protection works of water bodies, if any, abutting the road.	Contractor	CMU PMC	PMU
39.	Bridge Works & Culverts	▪ While working across or close to the rivers, avoid obstructing the flow of water. ▪ If an obstruction is required, to serve notice on the downstream users of water sufficiently in advance. ▪ Construction over and close to the non-perennial streams will be undertaken in the dry season. ▪ Construction work expected to disrupt users and impacting community water bodies will be taken up after serving notice on the local community.	Contractor	CMU PMC	PMU
40.	Safety practices during construction	▪ The Contractor is required to comply with all the precautions as required for the safety of the workers as per the International Labour Organization (ILO) Convention No. 62 as far as those are applicable to this contract. ▪ The contractor has to comply with all regulation regarding, working platforms, excavations, trenches and safe means of entry and egress.	Contractor	CMU PMC	PMU
41.	Aesthetic impairment	▪ Aesthetic enhancement through proper housekeeping of construction sites. ▪ Disposal of construction wastes at the approved disposal sites. ▪ Immediate closure of the trenches after pipe laying/ completion of work. ▪ Complete construction activity by removing all temporary structures, restoring the sub-project and surrounding areas as near as possible to the pre-construction condition.	Contractor	CMU PMC	PMU
42.	Tree plantation	▪ Trees felled will be replaced as per the compensatory afforestation criteria in accordance with the Forest (Conservation) Act, 1980. ▪ Five trees will be planted for every tree lost along the sub-project roads in locations to be identified with support from the PMU.	Contractor	CMU PMC	PMU
43.	Risk of accidents	▪ In order to guarantee construction safety, efficient lighting and safety signs shall be installed on temporary roads during construction and adequate traffic regulations shall be adopted and implemented for temporary roads.	Contractor	CMU PMC	PMU
44.	Cultural relics / Chance finds	▪ If fossils, coins, articles of value or antiquity, structures, and their remains of geologic or archaeological interest are found, local government shall be immediately informed of such discovery and excavation shall be stopped until identification of cultural relics by the	Contractor	CMU PMC	PMU

S. No.	Issues/ Impacts	Mitigation Measures	Responsibility		
			Execution	Supervision	Monitoring
		authorized institution and clearance is given for proceeding with work. All the above discovered on site shall be the property of the Government, and shall be dealt with as per provisions of the relevant legislation. ▪ The contractor shall take reasonable precaution to prevent his workmen or any other persons from removing and damaging any such article or thing. ▪ He shall, immediately upon discovery thereof and before removal acquaint the Engineer of such discovery and carry out the Engineer's instructions for dealing with the same, waiting which all work shall be stopped. ▪ The Engineer shall seek direction from the Archaeological Society of India (ASI) before instructing the Contractor to recommence work on the site.			
		During Pre-Construction to Post-Completion			
45.	Monitoring Environmental Conditions	▪ The contractor will undertake seasonal monitoring of air, water, noise and soil quality through a govt. established laboratory or a recognized monitoring agency as per ✓ Under Section 12 of Environment (Protection) Act, 1986 ✓ Section 17(2) of The Air (Prevention and Control of Pollution) Act, 1981 ✓ Section 17(2) of The Water (Prevention and Control of Pollution), Act, 1974 ▪ The parameters to be monitored, frequency and duration of monitoring as well as the locations to be monitored will be as per the Monitoring Plan prepared.	Contractor	CMU PMC	PMU
		De-Mobilization			
46.	Clearing of Construction of Camps & Restoration	▪ Contractor to prepare site restoration plans for approval by the Engineer. ▪ The plan is to be implemented by the contractor prior to demobilization. ▪ On completion of the works, all temporary structures will be cleared away, all rubbish burnt, excreta or other disposal pits or trenches filled in and effectively sealed off and the site left clean and tidy, at the Contractor's expense, to the entire satisfaction of the Engineer. ▪ Residual topsoil will be distributed on adjoining/proximate barren/rocky areas as identified by the Engineer in a layer of thickness of 75 mm – 150 mm.	Contractor	CMU PMC	PMU
		Pre-Construction & Construction			
47.	Orientation of implementing agency and contractors	▪ The PMU shall organize orientation sessions during all stages of the project. ▪ The orientation session shall involve all staff of CMU and field level implementation staff of Contractor. ▪ The contractor needs to comply with the World Bank's Environmental, Health, and Safety Guidelines.	Contractor	CMU PMC	PMU Experts of PMC

S. No.	Issues/ Impacts	Mitigation Measures	Responsibility		
			Execution	Supervision	Monitoring
48.	Handling of flora/fauna found in project sites	▪ The Contractor shall train the workers to handle any accidental finds of important species of flora and/or flora and on the procedures to be followed to intimate the Forest Department, and CMU.	Contractor	CMU PMC	PMU Forest Department
49.	Handling of Natural Habitats and Biodiversity Issues	▪ The PMU and CMUs will ensure that sub-project planning, preparation, implementation and operation and maintenance do not impact the biodiversity of the region.	Contractor	CMU PMC	PMU Forest Department
		Operations			
50.	Sludge and Waste water Disposal	▪ Sludge and waste water to be disposed off as per the CPHEEO manual ▪ A site for disposal of sludge and waste water need to be identified in consultation with the community members so as to prevent any inconvenience to the people residing in the area ▪ Proper disposal of sludge and waste water in the designated site only ▪ Proper measures to prevent leakage from underground drains for disposal of waste water ▪ In case of open drains measures to prevent any breach into adjoining areas (agricultural fields or residential)	Contractor	CMU	PMU
51.	Testing quality of water	▪ Establish a full fledged laboratory at the ULB and test both untreated and treated water for all relevant parameters as per CPHEEO manual. ▪ Test water at consumer end as per provisions of CPHEEO manual.	ULB	PMU	PMU
52.	Monitoring Operational Performance	▪ The CMU will monitor the operational performance of the various mitigation measures carried out as a part of sub-project. ▪ The indicators selected for monitoring include the survival rate of trees and utility of double glazing for noise sensitive receptors.	ULB	CMU	PMU

8 Grievance Redress Mechanism

8.1 Introduction

Grievance Redress Mechanism is part and parcel of any project administration, especially when the major stakeholders are public community that too with diverse social and economic characteristics. As these primary stakeholders under the APUWSSMIP have comparatively lower literacy levels and are engaged simultaneously in formal as well as informal sectors for livelihood, they require a more user-friendly grievance redress mechanism. Grievance redress mechanism should ensure accountability, responsiveness, and user-friendliness. In fact, the grievance redress mechanism of an organization is the gauge to measure its efficiency and effectiveness as it provides important feedback on the working of the administration.

The GoAP has established the following public complaint/ grievance redress mechanisms to ensure transparency in governance but also hold the officials and people's representatives accountable.

- Meekosam: Mee Kosam is a secured platform that is used for collecting the citizen grievances and route them to the concerned official in the last mile, online in real time. The last-mile official can access Mee Kosam by using dedicated log-in credentials coupled with Aadhaar e-KYC. Any official can see the details of only those grievances which are assigned for him/her. Citizens can also register their grievances through a secured login. Any citizen can see only those grievances which are registered by him/her.
- People First (App) and Pura Seva (App): This are mobile application that will empower citizens with real time governance. This enables citizens to access their profile, the various benefits accrued to them from the government and also register their grievances. This is a two way communication channel between government and the citizens.
- People First (Dial 1100): 'People First' where people can register their complaints directly by dialing 1100. The registered complaints will be addressed as soon as possible and selected complaints will be directly monitored by the CM. Complaints can be related to government schemes and services.

Apart from above, for the purpose of this project a grievance redressal mechanism is proposed as project beneficiaries and project affected people needs to access this with utmost ease.

8.2 Grievance Redress Committee

The project proposes to establish a Grievance Redress Committee (GRC) to register and redress the grievances and complaints of project stakeholders and project affected persons and resolve the same. The process will promote settlement of disputes and reduce

litigation. GRC will be set up at the ULB level with Municipal Commissioner as head. The following persons will be the members of GRC:

- The Municipal Commissioner - Chairperson
- The PHMED Engineer – Convener
- The AE/AEE of the ULB - Member
- Two Public Representative (at least one women) - Member
- Two Eminent Citizen/Local Representative (at least one women) from Social Sector/ Person conversant with similar issues and he/she should be widely respected and having problem solving skills – Member.
- Two persons (at least one women) from group of each of five wards – Member.

The GRC at the ULB level will address community level complaints. If the GRC is not able to address the complaints, it will be escalated to the PMU, to a Panel comprising of the following:

- Project Director
- Director – Technical
- Social Development Specialist

Normally complaints lodged with the GRC will be resolved by the Committee within 15 days or 2 weeks. In case the complaints are escalated upwards to the PMU, the resolution will be made within 30 days.

8.2.1 Functions of GRC

The broad functions of GRC shall be the following:

- Record the grievances of Complainants/ PAPs, if any, categorize and prioritize them and provide solution to their grievances related to any of the provisions set forth in SMP/ RPF. Grievances may be related to construction phase, land securing, removal of encroachers and subsequently related to water supply and sanitation services
- The GRC may undertake site visit, ask for relevant information from CMU (City Management Unit) and other government and non-government agencies, etc., in order to resolve the grievances.
- Fix a time frame for resolving the grievances within the stipulated time period of 15 days. If the Complaint is escalated upwards to the PMU, the Complaints will be resolved in 30 days
- Inform Complainants/ PAPs through CMU about the status of their case and their decision to PAPs for compliance.
- The GRC will maintain a Grievances Register and send monthly reports on the grievances received and redressed. This will be done by the AE/ AEE of CMU. The PMU will maintain records of all complaints registered, resolved or pending.

The Social Coordinator/Expert and Communication Specialist of PMU and AE/AEE of CMU shall provide all necessary help to complainants in presenting in his/her case before the GRC. The GRC shall respond to the grievance within 15 days. The GRC will normally meet once in a month and if the situation so demands, it shall meet more frequently. The decision of the GRC shall not be binding to PAPs. This means the decision of the GRC does not prevent PAPs taking recourse to court of law, if he/she so desires.

Adequate measures should be taken to ensure that the people in the ULB or the affected persons along the transmission alignment are aware of the GRC and can access the GRC at will. The NGO responsible for Community Participation activities will be responsible for reaching the people and informing them about the GRC, its functions and means of connecting to the GRC members. Firstly, pamphlets should be distributed containing information on the functions of the GRC and names of the Panel Members. Secondly, wall writing should be conducted in appropriate places indicating the names of the GRC members and their Cell phone numbers.

8.2.2 Details of the Complaints

The Complaints Register should contain the name of the Complainant, address, nature of the complaints. The Register should also contain provision for date of resolution of the Complaint and the level at which the Complaint is resolved. The format/items for registering Complaints is listed in next section.

At the end of every month, the data from the ULB level GRCs should be send to the PMU. The Social Development Specialist will maintain documentation on the proceedings of the GRC. This will be part of the 6-monthly monitoring report of the Bank funded project.

8.2.3 Documentation of the GRM Processes

The GRCs at each level will maintain the following three Grievance Registers that would, among others, help with monitoring and evaluation of the functioning of GRCs but also to document the processes of GRCs. The Grievance Register will have the following details:

- Serial Number
- Case Number
- Name of Complainant
- Gender
- Name of Parent/Spouse
- Full Address of the Complainant
- Main complaint/grievance
- List of documents attached
- History of Previous complaint/grievance, if any
- Date of receipt of complaint/grievance
- Date of acknowledgement of complaint/grievance

- Date of field investigation, if any
- Date of hearing
- Decision of GRC at that level
- Progress – redressed, pending or rejected
- Key agreements/commitments
- Decision/Response of the complainant/grieved person
- Date, Mode and Medium of communication to complainant/grieved person
- Date of closing of complaint/grievance
- Whether appealing to next level – yes or no
- Whether or not seeking legal redress.

The grievance redress process will be a continuous, transparent and participatory process that would be an integral part of the project's accountability and governance agenda. The GRC at each level will maintain the above- mentioned Registers. The CMU will also prepare periodic reports on the grievance redress on the basis of reports received from the two levels of GRCs.

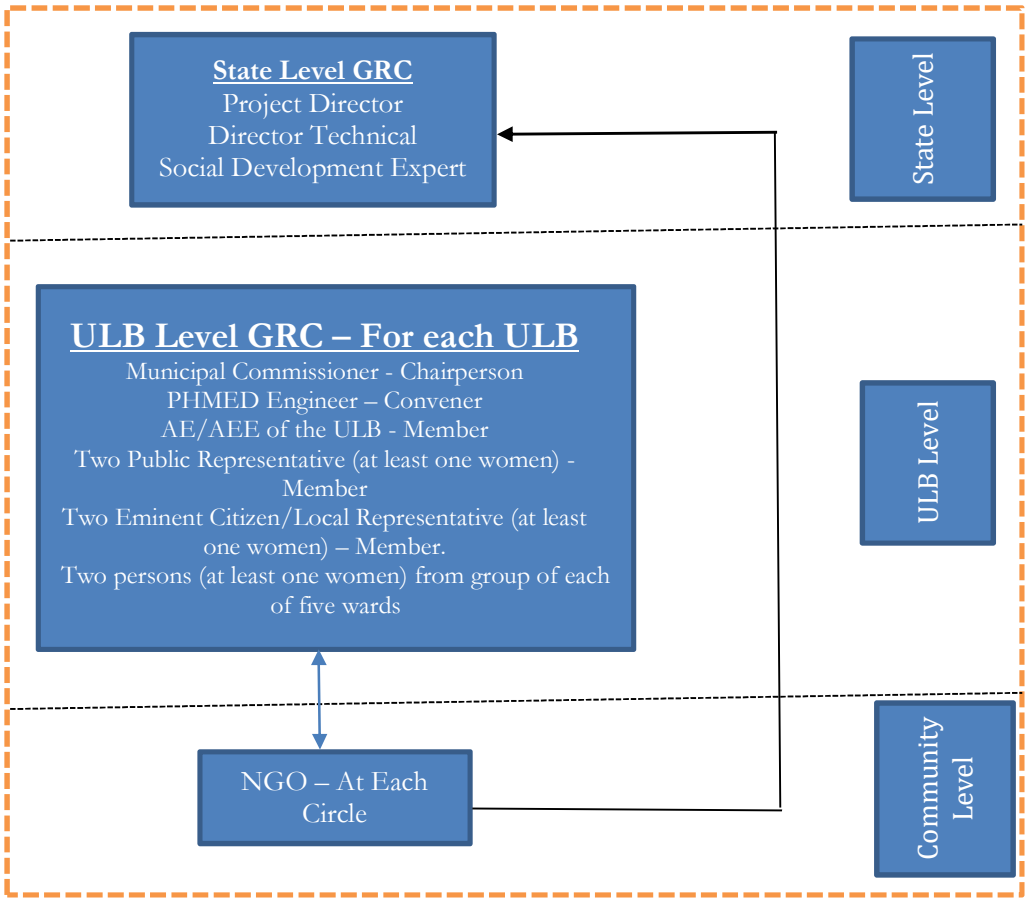


Figure 15: Grievance Redressal Method and Process

8.3 Responsibility of NGO with particular reference to GRC

The NGO at the community level is responsible for community participation on various issues such as Solid Waste Management, enhancing community awareness on water use and payment of tariff, mobilizing women for effective program implementation & service delivery. The role of the NGOs has been designed to be the key interface between the communities and the ULBs/Project proponents. Hence the NGOs will be given the responsibility of disseminating information regarding the functions of GRC at the grassroots.

The NGOs will identify the populations in the ULBs and have consultations with the people regarding the benefits and impacts of the project on them. The community members will be actively encouraged to contact the GRC in case they have any concerns or complaints. The process of registering the complaints will be clearly explained to community members and they will be encouraged to contact the GRC members as and when required. The NGOs will ensure that the names of the GRC members along with phone numbers are made public with wall writings in prominent places.

The NGOs will act as the link between the ULB and PMU. One of the tasks in this respect would be to collate the information regarding the GRC at ULB level, document the information and share the documents as part of the monthly report to the PMU. The NGOs will also keep a strict vigil on the issue of equitable distribution of benefits. In case the services are not distributed equitably, and the issue is not captured by GRC documentation, the NGOs will report on such matters to the PMU.

9 Monitoring and Evaluation

9.1 Introduction

The ESMPF requires detailed supervision, monitoring and evaluation of the impact of the project on the environment and social aspects. In order to carry out this, PMU will have specific arrangements made at ULB level. This includes appointment of an Environmental Specialist and Social Specialist for the project period at the PMU. Further the PMU will instruct CMUs on how to implement the provisions of this ESMPF. Implementation of the provisions of ESMPF will be new to these staff and hence several orientations and trainings are proposed as a part of this ESMPF to build their capacity. The PMC will monitor and supervise the ESMF requirements at the ULB level. In order to achieve the objectives of this ESMPF and to ensure the safeguards are implemented in a proper and effective manner, the following provisions are made in this ESMPF:

9.2 Environmental and Social Supervision

This is basically done by PMU. All the sub-projects will be visited at regular intervals by PMU to check if all safeguard requirements are met and to identify any issues that need to be addressed. The PMU will supervise and monitor the ESMF implementation at the apex level and PMC will supervise and monitor the ESMF implementation at the ULB level on a day to day basis. PMU would submit half-yearly progress reports to AIIB on safeguards implementation. The Environmental and Social Specialists of the PMU will be primarily responsible for environmental and social supervision.

9.2.1 Environmental and Social Safeguard Reporting

Once every year, the PMU will prepare a report of the environmental and social situation in the project districts including data and analysis of relevant parameters. PMU will generate this report based on a) the monthly supervision and monitoring reports submitted by the PMC for each ULB and b) the monthly reports submitted by the NGO for each ULB. This report summarizes the PMC reports and NGO reports and adds information from site visits of PMU environmental and social specialists. The PMC and NGO transmit their reports through the CMU. This report also should give a listing of relevant new legislation and regulations that have a bearing on the environmental and social performance of the project. PMU will submit this report to AIIB. The ESMPF will be suitably revised annually on the basis of this document by the PMU with the prior consent of AIIB and submit the same for review and comments to AIIB and finalize thereafter.

9.3 Concurrent Internal Monitoring

The concurrent internal environmental and social monitoring will be done as part of the regular monitoring by the Project Monitoring Consultants (PMC) and CMUs. The PMU would review this, on periodical basis, through the Environmental and Social Specialists.

The monitoring will incorporate both qualitative and quantitative analysis and will also be used as a course correction if necessary. The Environmental and Social Experts of the PMU will be primarily responsible for environmental and social monitoring and evaluation.

9.3.1 Environmental and Social Monitoring

This will comprise of the following sets of activities:

- Monitoring compliance with environmental and social regulations and safeguards and Environmental and Social Management Plans provisions, also monitoring of the Contractor's EMP
- Continuous Social Impact Monitoring at the Community Level - – Reports provided by the NGOs on the Community Participation and Safeguard Monitoring work
- Independent External Environmental and Social Audit (IEESA) – Justify engagement of IEESA in Section 9.5. Explain in detail the work of the IEESA; provide TOR & Job description
- Overall State Level Monitoring and Oversight of Environmental and Social Issues at state level – Explain this function in detail

9.3.2 Monitoring Plan

Indicate the Plan for monitoring of the Contractor's EMP
Given in the table below are indicators for project investments, for which monitoring need to be taken up by PMU in a regular manner.

Table 9-1: Monitoring Plan for ESMPF

Project Phase	Monitoring Indicators	Frequency	Agency
Construction phase of all project components	**Environmental parameters** ▪ Air Quality ▪ Noise Quality ▪ Soil Quality ▪ Water Quality ▪ Sedimentation in water bodies - Turbidity ▪ Debris deposits on lands – Area/ No. of locations **Social parameters** ▪ Adequacy of entitlements (replacement cost, allowances, income generation grant, etc.) ▪ Payment of compensation and entitlements before replacement ▪ Time taken for land acquisition ▪ Displacements if any; category of households displaced, resettled and compensated ▪ Number of grievances registered and redressed ▪ Number of court cases ▪ Income patterns ▪ Changes in occupations ▪ Housing status (area, floor, walls, roof, etc.) ▪ Ownership of household assets ▪ Health Status	▪ Quarterly by PMU	▪ PMU guiding the collection of information on indicators ▪ CMUs for specific information

Project Phase	Monitoring Indicators	Frequency	Agency
	▪ Incidence of waterborne diseases **Other** ▪ No. of training programs conducted ▪ No. of personnel trained ▪ Trainees' understanding of the training content ▪ Achievement of learning objectives ▪ Application of methods, tools and techniques learnt during training ▪ Adherence to contract conditions and standards (housing, sanitation, crèches, use of local labour, equal wages to men and women, avoidance of child labour, etc.) ▪ Absence of inconvenience, nuisance and complaints ▪ Adherence to ESMPF provisions/ guidelines during sub-project preparation and implementation		
Operation Phase	▪ Sanitary survey of water supply system: Periodic survey of the system is necessary to identify if any new pollution sources are emerging ▪ Water Quality ▪ Water Supply Quantity ▪ Income patterns ▪ Health Status ▪ Incidence of waterborne diseases ▪ Satisfaction with water supply services ▪ Condition of wastewater ▪ Status of payment of tariff ▪ Performance of FSTP ▪ Number of women representing in GRC, O&M of the sub-project, received trainings and involved in IEC ▪ Time savings for women (all data should be gender segregated)	▪ Half yearly	▪ ULB/ ▪ CMU

9.4 Sanitary Survey

Sanitary inspection requires detailed examination of the water-supply system, especially at its key points in order to check whether the installations are satisfactory and whether the various operations are being carried out properly. The recommended method of undertaking an inspection is to follow the natural sequence: starting with the source water and its intake, and going on to treatment, disinfection, storage, distribution, etc. Observations are recorded on preset forms. Formats are annexed (***Annexure 6&7***).

9.5 Independent External Environmental and Social Audit (IEESA)

The PMU will be overall in charge of implementing the ESMPF. The Environmental and Social Experts of PMU will guide and oversee the implementation of the ESMPF at field level through the technical expert at each ULB and NGOs at the circle level. This overall guidance

will be given by them. Further the PMU will incorporate the provisions of this ESMPF as actionable points in the Project Operations Manual or other similar document for the project. These will be non-negotiable and will have to be followed by all CMUs.

In order to achieve the objectives of this ESMPF and to ensure the safeguards are implemented in a proper manner, provision for a half-yearly Independent External Environmental and Social Audit (IEESA) should be made. The audit will ensure and check a) the adequacy/correctness of ESD Screening, b) adequacy of EIA and SIA and EMP and SMP, c) source sustainability measures, d) the compliance of the environmental and social aspects of projects, which are under implementation and completed, e) adequacy of SMP/ RAP implementation, f) assess the effectiveness of supervision and monitoring g) effectiveness of capacity building initiatives undertaken as part of the ESMPF and h) review and comment on how the recommendations of the previous audits have been followed so far. The Audit is done from an external and third party perspective without any bias; keeping in mind all the monitoring and evaluation is done internally. The PMU will ensure that half-yearly independent external Environmental and Social Audit, of the sub-projects on sample basis (say about of 10% works or minimum 5 sub-projects during every half year), is undertaken to assess the level of compliance of the provisions laid under ESMPF and effectiveness of ESMPF compliance in sub-projects by all the partners in development. A list of performance indicators will be monitored to ensure quality of implementation and effectiveness of the environmental mitigation measures. A Terms of Reference is annexed (***Annexure 6)***.

9.6 Performance Indicators

A list of appropriate performance indicators are proposed which need to be integrated with the project indicators for monitoring and evaluation with other indicators as tools to assess the project performance are given below.

A. Water

1. Coverage of Municipal House Service connection in ULB (%)
2. Per capita supply
3. Continuity of water supply (Frequency of supply, Number of hours of supply, Reliability)
4. Quality of water supply (Periodic testing at end user level)
5. Cost recovery: O&M
6. Coverage of Municipal House Service connection in slums
7. Number (and %) institutions with Municipal water connections
8. Efficiency in redressal of consumer complaints
9. Collection efficiency of water charges (%)
10. Time savings for women

B. Environmental Sanitation

1. Coverage of toilets (%)
2. Coverage of wastewater network services (%)
3. Adequacy of wastewater treatment capacity (%)
4. Extent of reuse and recycling of wastewater (%)
5. Efficiency in redressal of customer complaints (%)
6. Coverage of toilets in slums (%)
7. Coverage of sewerage connections in slums (%)
8. Percentage of length of street/roads in ULB provided with storm water/sullage drains

C. Solid Waste Management

1. Household level coverage of MSW services
2. No of NGOs/CBOs involved in MSW
3. NGOs/CBOs conducted IEC per ward per month
4. NGOs/CBOs involved in implementing MSW
5. Efficiency of collection of municipal solid waste
6. Extent of segregation of municipal solid waste
7. Extent of municipal solid waste recycled
8. Efficiency in redressal of customer complaints

D. Institutional Arrangements and Capacity Building:

1. No. of project staff at state (PMU), ULB (CMU) and implementing and support agencies trained in ESMPF as a percentage of all project staff at each level
2. No. of community institutions that participated in IEC programmes conducted on ESMPF as a percentage of all community institutions involved in the project
3. Number of external audits conducted as against the target number of audits for the project duration.

E. Others

1. Number of SHG participated in IEC programme
2. Percentage of women in GRC against total member
3. Percentage of women working at state level, ULB level and implementation facilitation against total
4. Percentage of women working in construction agencies against the total labourers
5. No of SHGs engaged in O&M

10 Institutional Arrangements

10.1 Introduction

APUFIDC will setup a two- stage project implementation and monitoring mechanism for the purpose of APUWSSMIP. Project Management Unit (PMU) oversees the project at State level supported by the City Management Units (CMU) at ULB level. Project Management Consultancy (PMC) addresses the Technical needs for the project supported by field level technical functionaries reporting to PMC at project level. The PMC will have E&S staff who will supervise the ESMPF implementation at the ULB level.

The project will be implemented through a Project Management Unit (PMU) headed by Managing Director, APUFFIDC, who will double up as Project Director, and will function under overall supervision of APUFIDC. The other key functionaries of PMU are:

- Additional Director (AIIB Project)- Additional Project Director
- Director Technical (Cadre of Chief Engineer)
- Project Manager (Cadre of SE)
- Capacity Building Officer (Cadre of Joint Director)
    - Functional Experts
    - Administrative Staff
    - Environmental Specialist
    - Social Specialist

At ULB level there will be City Management Unit (CMU) for each of 50 Project ULBs in the state. The project ULBs will be manned with technical experts comprising of an urban Infrastructure Expert and Urban Planner for each Project ULB. These CMUs will work for 4 years. The technical experts selected for the CMUs will be dedicated full time staff and will be stationed at respective ULBs. Each CMU will have an AE/ AEE designated as Environmental Expert. They will assist in implementation of the project at ULB level and also support the ULB Commissioner in preparation of various developmental and service improvement plans/ strategies/ reforms towards strengthening of respective ULB in water supply delivery and related infrastructure. The PMC will have staff for monitoring the ESMPF at the ULB level. Depending on the requirement, the PMC will commission the Environmental Experts to monitor a group of ULBs.

APUWSSMIP scope is divided into four broad components namely Planning, Design, Supervision and Project Management. To provide support in project execution in ensuring cost, time and quality compliances, Project Management Consultant (PMC) will be appointed.

PHMED is the Implementing Agency and will be responsible for the technical implementation of the project in coordination with the respective ULBs. The role of the PHMED will be to provide technical sanctions to DPRs and final design, procurement and

tendering for works and goods, construction monitoring and supervision, ensuring quality controls, approval of payment certificates for works contracts, authorizations for payment supervision, MIS reporting through IT based interface and safeguards implementation.

10.2 Environmental and Social Implementation Arrangements

10.2.1 At PMU Level

Within the PMU, full time Environmental and Social Development Specialists will be deployed to handle all matters pertaining to environment and social management under the project, including implementing the ESMPF. The Social Development Component will include Social Safeguard, and Community Engagement. The tasks of the Social Development Component will be managed by a Social Development Specialist, within the PMU. The Social Development Specialist will be supported by a Communication Specialist at the PMU level.

These Environmental and Social Development Specialists will be available for the entire project duration. The key responsibilities of the Environment and Social Specialist include:

- Orientation and training of CMU Teams, PMC Team and the Contractors on environmental and social management; for mainstreaming the activities. All on site staff, in particular the engineering, safety, security staff will be oriented and trained.
- leading/ providing oversight on the EMP/ SMP process and its outputs,
- Review of monitoring reports submitted by the CMU and PMC on ESMPF/ EMP/ SMP/ RAP/ TPP implementation,
- Conducting regular visits to project sites to review ESMPF compliance during sub-project planning, design and execution,
- Providing guidance and inputs to the CMU teams on environment and social management aspects.
- Orient, train, guide and support the Technical staff of the CMUs.

These Specialists will also deal with matters pertaining to integration of ESMPF into the sub-project design and contract documents; preparation of Terms of References for studies (such as for EA/SA); reporting, documentation, monitoring and evaluation on environment and social aspects and will ensure overall coordination with the PMU and CMUs and PMC.

10.2.2 At ULB Level

At the ULB level, the CMUs will support the Environmental and Social Development Expert in carrying out the responsibilities listed above. Each CMU will have one AE/AEE designated as Environmental Expert. These Environmental Experts will be trained in implementing EMPs.

10.2.3 Project Management Consultants

Further to support the Environment and Social Specialists, the Project Management Consultants will also engage environmental and social experts that will implement and review the implementation of various EMP/ SMP/ RAP/ TPP activities for all the sub-projects. In addition to providing regular inputs on improving the safeguard implementation practices in the project, the PMC will submit quarterly reports to PMU, which will be an important resource for Bank team's assessment on safeguards management of the project.

10.2.4 Roles and Responsibilities of NGOs

NGO will play a significant role in management, restoration and conservation of freshwater resources through public process based in local cultural belief. The NGO at the community level is responsible for community participation on various issues such as enhancing community awareness on water use and payment of tariff, Solid Waste Management, mobilizing women for effective program implementation & service delivery. The role of the NGOs has been designed to be the key interface between the community and the NGOs will be given the responsibility of propagating the project activities and functions at the grassroots.

NGOs will educate and build the capacity of the ULB/Consumers/Beneficiaries to educate about how to use the water bodies without polluting them. Capacity building of the local resident/Women groups/youth clubs in monitoring the water quality with the help of user-friendly field test kits. NGOs need to involve school, college, universities in mass awareness campaigns.

The NGOs will act as the link between the ULB and PMU. One of the tasks in this respect would be to collate the information regarding the project at ULB level, document the information and share the documents as part of the monthly report to the PMU. The NGOs will also keep a strict vigil on the issue of equitable distribution of benefits. In case the services are not distributed equitably and the issue is not captured by GRC documentation, the NGOs will report on such matters to the PMU. The NGO will facilitate the implementation of resettlement and rehabilitation of affected person due to project activities and inform PMU to ensure the entitlement reaches the affected persons before commencement of the construction activities.

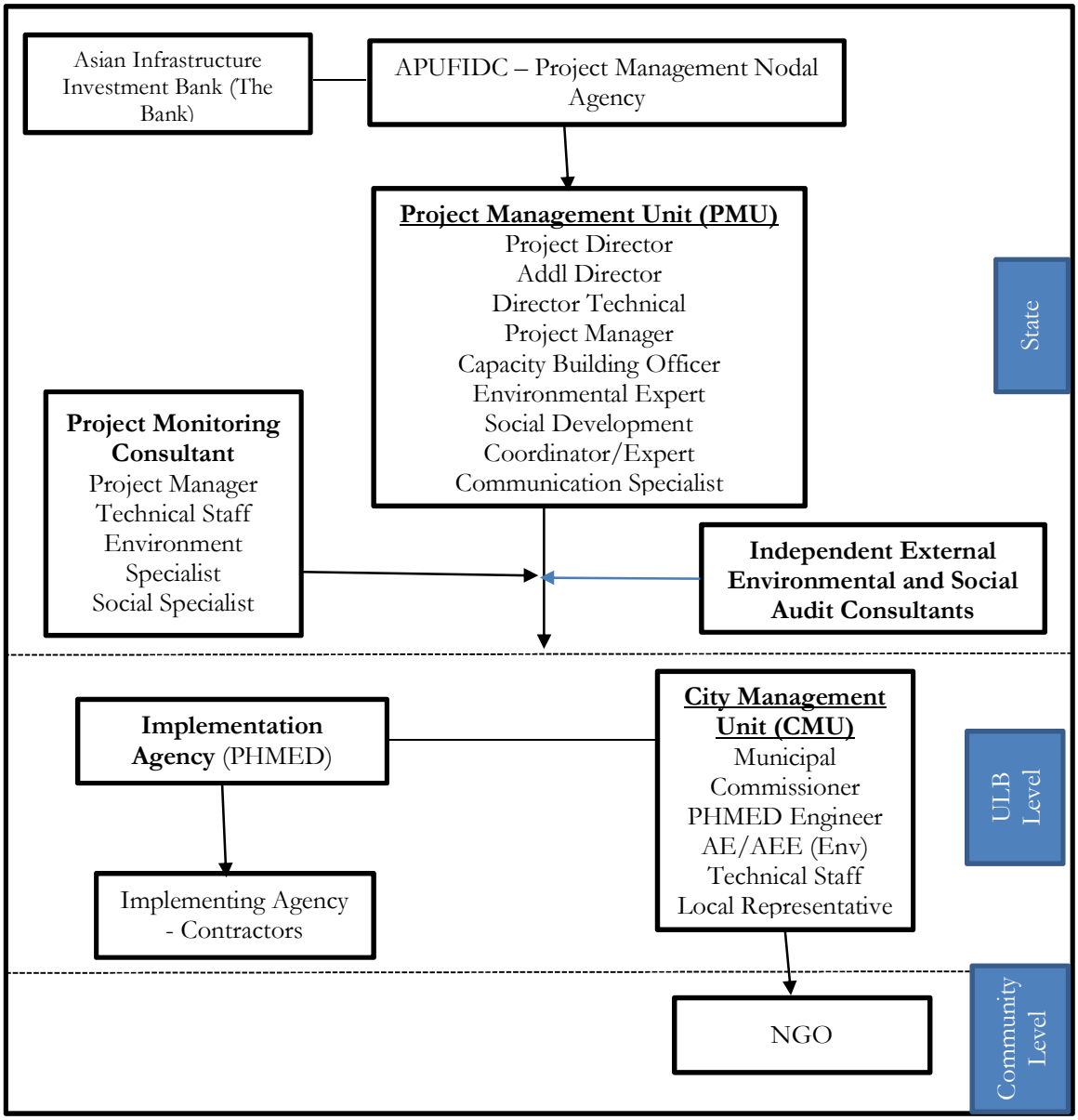


Figure 16: Institutional Arrangement for Environmental and Social Implementation

11 Training and Capacity Building

11.1 Introduction

The APUWSSMIP implementing staff will need to have awareness, sensitivity, skills and experience regarding the environmental and social aspects of sub-projects' planning and implementation. For sustainability and seamless adaption of the environmental and social principles and safeguards by PMU and all the CMUs, awareness creation and capacity building become necessary.

This capacity building and training strategy has been outlined as part of the ESMPF for building environmental and social awareness and environmental and social management capacity in the project administration structure as well as in the intended target communities. Capacity building for environmental and social management will be integrated with overall capacity building component of the project.

11.1.1 Objectives

The objectives of the capacity building initiatives are:

- To build and strengthen the capability of APUWSSMIP, ULB and PHMED staff, and other partners to integrate sound environmental and social management into sub-project implementation.
- To orient the APUWSSMIP, ULB and PHMED staff, PMU and CMUs at ULB level and communities to the requirements of the project's ESMPF.

Systematic capacity building initiatives need to be introduced only after completion of Training Needs Assessment. The training should be of cascade mode. All the trained staff and others will in turn conduct further trainings at ULB level. However, since capacity building goes beyond mere imparting training, institutionalization of best practices becomes a prerequisite for improved sub-project environmental and social management. The training outcomes like trainees' understanding of the training content, achievement of learning objectives, application of methods, tools and techniques learnt during training, etc. need to be monitored and audited.

11.1.2 Trainers

In view of the specialized training and capacity building envisaged for the ESMPF of the project, it is necessary to identify nodal training institutes that will work closely with PMU for conceptualizing, designing, conducting and managing training programs on the ESMPF. Some such specialized institutions are:

- Selected Expert Staff of APWSSMIP

- Selected Expert Staff of PHMED, Women and Child Welfare Department, Social Welfare Department, Disaster Management, Environment and Forests and Climate Change Adaptation Department, Mines and Geology Department, etc.
- Experienced faculty from premier engineering institutions and social institutes
- Respective State Pollution Control Boards and Central Pollution Control Boards
- Engineering Staff College of India, Hyderabad
- Other Identified Consultants

The details of the proposed training programs are as below:

- Orientation/ Learning Training Programs
- Training on the ESMPF and ESIA, EMP, SMP, RAP, TPP, etc.
- Training on Environmental and Social Management
- Workshops on ESMPF

11.1.3 Trainees

The likely participants are key officials of the project, PMU staff, CMU staff, PHMED Staff, State Level Environmental and Social Specialists, District level Environment and Social Experts, Resource Persons, Local public Representatives, Community Representatives, CSOs, CBOs, Women Groups, etc.

About 20 to 30 trainees would participate in each of the training programs. It is intended that these trained persons will in turn provide onsite training to APUFIDC, ULB and PHMED staff, CMUs, Resource Persons, Local Public Representatives, Community Representatives, CSOs, CBOs, Women Groups, etc. on site at district/ sub-project level.

11.1.4 Training Concepts and Modules

Table 11-1 Training Concepts and Modules

Training	Concepts	Duration	Participants
Orientation/ Learning Training Programs	ESMPF Concept • Regulatory Requirements • E&S Priority Issues • EA/SA Process Outline Reports & Formats Module	Half Day at Circle Level	APUIFDC PMU Staff Implementation Agency – PHMED Staff CMU Staff
Training on the ESMPF and Mitigation Plans	<u>Environmental/Social Assessment Process</u> • Environmental/Social Laws & Regulations • EIA/SIA process • Identification of Environmental/Social Impacts • Impact Identification Methods - LA process, Identification of PAPs • Identification Mitigation Measures • Formulation of Environmental and Social Management Plan • Implementation and Monitoring	One Day at Circle Level	PMU - Staff (Environmental and SDU) Implementation Agency – PHMED Staff DPR Consultants CMU Staff PMC

	• Institutional Mechanism		
Training on Environmental and Social Management	• Monitoring and supervision - to sustainability of water sources, water quality, protection of sources and Environmental appraisal. Water quality monitoring, prevention of pollution & surveillance. • Environmental and social indicators • Reporting- format & content	One Day at Circle Level	PMU – Staff (Environmental and SDU) Contractors CMU Staff NGO
Workshops (State)	• Experiences on implementation of E&S in implemented sub-projects. • Best Practices followed in E&S	One day at State Level	PMU - Staff (Environmental and SDU) CMU staff Implementation Agency – PHMED Staff PMC
Workshops (Circle Level)	• Awareness on safe drinking water • Awareness on water conservation • Awareness on Climate Change Adaptation Actions • Awareness on environmental sanitation • Awareness on personal hygiene	One Day at Circle Level	PMU - Staff (Environmental and SDU) CMU Staff Implementation Agency NGO/CBOs/SOs/Women Groups/Representatives/others

11.2 Training Budget

The total estimated cost of training on environmental and social management for members of APWSSMIP, PMU, ULB, PHMED, CMU, etc. under the proposed project is presented in the table below:

Table 11-2: Training Budget

S. No.	Training	No. of Programs	Estimated Unit Cost in Rs.	Total Cost In Rs.
1	Orientation/ Learning Training Programs	10	1,00,000	10,00,000
2	Training on the ESMPF and Mitigation Plans	10	2,00,000	20,00,000
3	Training on Environmental and Social Management	5	2,00,000	10,00,000
4	Workshops (State)	5	2,50,000	10,00,000
5	Workshops (Circle Level)	10	1,00,000	10,00,000
6	Provision for travel, allowance, other training expenses, etc.	LS	10,00,000	10,00,000
7	**Total**			**70,00,000**

12 Gender and Vulnerable Peoples Action Plan

12.1 Background

Despite the gains made, gender and social inequality remain issues of major concern in rural India. As per gender statistics 2015 data women comprise 37.15% and 40.95% both rural and urban and rural of workers respectively in Andhra Pradesh. Of these women most are concentrated in vulnerable, unsafe and low-paying activities. They earn less, have fewer assets and bear the burden of unpaid work and care. Girls and women face high rates of violence and sexual harassment in the work place; public spaces and at homes which in turn restricts their mobility. Informal data also suggests prevalence of trafficking and forced labour, including high prevalence of child labour and homelessness. Poor access to basic services such as education and health facilities, housing, drinking water and electricity compounds issues of gender and social inequality even further.

12.2 Impact on Women

As part of ESMPF, gender and vulnerable guidelines are developed to mitigate any potentially adverse gender specific impacts of the Project and to enhance the design of the Project to promote equality of opportunity and women's socioeconomic empowerment, particularly with respect to provision of services and employment. It particularly speaks of ensuring safety of citizens especially children, women, elderly and the other vulnerables. The vulnerable groups include Scheduled Tribes and Castes, Women Headed Households, Widows, Deserted Women, Divorced Women, Destitutes, Sex workers, Transgenders, Differently Abled Persons, Below Poverty Line Families, Old Aged, Chronically Ill and People with Debilitating Illnesses (HIV/ AIDS, Leprosy, Mental Illness, Tuberculosis, etc.), Street Children, Orphans, Rag Pickers, Rickshaw Pullers, Homeless, Construction Workers, Daily Wage Labourers, Domestic Workers, Head Loaders, Sanitary Workers, Vendors, People Living in Night Shelters, etc. The mandate for Gender strategy is also rooted within a number of key government laws, policies and legislations that area given in the earlier chapters.

Women play a central part in the provision, management and safeguarding of water. Women and girls spend significantly more time acquiring water than men and boys. Water collection can foster social cohesion and provide women with an opportunity to communicate with other women and people outside their homes. On the other hand, it is a heavy task that also can expose women to threats of violence and health hazards when they need to go far distance to collect water. Lack of access to water also decreases women's roles in contributions to agricultural production, food security and business and employment opportunities. Water Supply reliability and water scarcity may lead to a double hardship for women. First of all, they may have to walk longer distance to collect water which is time consuming and can expose them to danger. Secondly, due to security, cultural or social constraints women's mobility can be restricted which will decrease their access to water and

adequate sanitation facilities even further. Despite a range of labor laws and initiatives, the construction industry remains male dominated. Women are discriminated against and are often offered lower wages and poorer working conditions. The health and safety concerns of women and children are often overlooked in construction sites.

12.2.1 Gender Strategy through the Project Cycle

The project cycle consists of 5 key phases which are 1) Pre-Planning, 2) Procurement, 3) Implementation, 4) Operation and Maintenance and 5) Transference. The several actions to be taken during project cycle are briefed in the table below. The action to be taken are also detailed in the subsequent sections below:

Table 12-1: Gender Strategy through the Project Cycle

S. No.	Project Cycle Phase	Actions to be Taken	Responsibility
1	Planning (This phase includes pre- planning and planning phases. The activities include undertaking feasibility studies, concept reports, inception reports, plan of operations, etc.)	To ensure effective gender and social inclusion it would need the following actions (these are detailed in the below sections): ➢ Collecting data on the socio- economic characteristic of the women and marginalized social groups. ➢ Organizing consultation with women and social groups. ➢ Analyzing data (secondary and primary) to identify key gender and social group concerns and ways of tackling them. ➢ Mitigating probability and risk of displacement/land alienation and devise ways to mitigate the impact on people's lives; livelihoods; compensation etc. ➢ Ensuring that RPF provisions such as registration of houses/ sites, etc. is done in the name of both the spouses and entitlements are deposited in the spouses' joint account. ➢ Incorporating gender and social group focus provision into the design of the project which includes creating opportunities for job creation; better access to services such as; safety and security to reduce violence against women and girls; mechanism to reduce child labour, etc.	• PMU • CMU • PMC
2	Procurement (Activities under this phase include Pre-qualification of consultants and contractors, bidding, contract awards, etc.)	The bidding documents should include statutory requirements related to the following: ➢ Relevant labour laws ➢ Relevant clauses of acts such as equal wages ➢ Child labour ➢ Labour camp requirements ➢ Special provisions for women ➢ Requirements for safety at work place	• PMU • CMU
3	Implementation (This key phase includes Executing the projects, construction, supply of goods and	This is a key phase where important actions need to be taken. Some of the actions are listed briefly below. Other details are given in the subsequent sections below this table. ➢ Ensure that the women are consulted and invited to participate in project activities, to gain jobs and control	• PMU • CMU • Contractors • PMC • Independent External

	equipment, commissioning, etc.)	over the resources, along with proper scheduling of construction works. ➢ Ensure compensation for land and assets lost faced by women and marginalized groups being adequately identified and covered. ➢ Ensure compensations and assistances would be paid in a joint account in the name of both the spouses; except in the case of women headed households and women wage earners. ➢ Ensure that women and marginalized groups are provided identify cards, helped in opening accounts in the bank, receiving compensation amounts through cheques in their name. ➢ Ensuring facilities in construction camps such as temporary housing; health care facilities; Day Crèche Facilities; water and sanitation. ➢ Prevent use of child labour, unequal wages to women, sexual harassment of women, children at the construction place, build awareness of Controlling STD, HIV/AIDS, etc.	Environment And Social Audit
4	Operation and Maintenance (Operation of facilities and their repair, maintenance (preventive maintenance, corrective maintenance and breakdown maintenance), some augmentation, etc.)	The actions to be taken during this phase are: ➢ Encourage women and vulnerables to be employed in operation and maintenance activities. ➢ Train women and vulnerables to match the skills required for O&M activities. ➢ Train women and vulnerable in suitable livelihoods activities to enhance their skills and income. ➢ Where possible assign O&M contracts to local SHGs. ➢ Build capacity of women and vulnerable organizations/ institutions to take up O&M functions. ➢ Make sure the Grievance Redress committees have at least one third women members and adequate vulnerables as members. ➢ Conduct an Impact Assessment of Social Actions (implementation of SMP, RAP/ ARAP, TPP, etc.) taken.	➢ PMU ➢ CMU ➢ Contractors ➢ PMC
5	Transference (Activities include documenting lessons learnt, dissemination of findings, incorporating these into future projects design, etc.)	The actions to be taken during this phase are: ➢ The Project Completion Report to have an exclusive chapter on Gender and Social Inclusion. ➢ This section in PCR to capture the implementation outcomes of Gender Strategy. ➢ Dissemination of PCR findings for adoption by future projects. ➢ Conduct experience sharing workshops/ seminars with sector agencies.	• PMU • PMC consultants • AIIB

12.2.2 Addressing Inequities

It is envisaged that preparing and implementing Resettlement Action Plans, Tribal People Plans, Gender Action Plans and other Social Management Plans and their implementation, would ensure interests of these vulnerable groups would be adequately addressed and protected.

12.2.3 Information on Women and Vulnerable Groups

Like in other projects, as per available experience, in these sub-projects as well, women are likely to experience differential socio-economic setbacks due to their disadvantaged positioning within socio-economic structures and processes. This is likely to be manifested most in the loss of common property resources as a result of their displacement. In order to mitigate such impacts, the verification and socio-economic survey shall collect information on the following:

- Number of women headed households and Tribal households and other vulnerables
- Socio-demographic characteristics of affected women and tribals and other vulnerables
- Health status including number of children per woman
- Women's role in household economy by collecting information on usual activity, occupation; etc.
- Time Disposition
- Decision making power among women PAFs

The Vishakha Guidelines against sexual harassment in the workplace

Sexual harassment includes unwelcome sexually determined behavior (whether directly or by implication) as:

a. Physical contact and advances
b. A demand or request for sexual favours
c. Sexually coloured remarks
d. Showing pornography
e. Any other unwelcome physical, verbal or no-verbal conduct of sexual nature

As women are often the worst victims of transition between displacement and resettlement, they have to be integrated in the project as full-fledged participants taking part in all the stages of the project starting from planning through implementation and on to the post-project stages. This is the only way to make sure, that the process of resettlement and rehabilitation, an exercise in equitable distribution of resources and benefits in a gender sensitive manner.

12.2.4 Participation of Women and Vulnerables

Participation and engagement of women and other vulnerables can be ensured specifically in the following ways:

- Allow and facilitate women to take part in the consultation process.
- Ensure that the women are consulted and invited to participate in group-based activities, to gain access and control over the resources. Guidelines for compensation for land and assets lost, being same for all the affected or displaced families, special care needs to be taken by the CMU for women groups, while implementing the process of acquisition and compensation as well.

- Ensure that women are actually taking part in issuance of identify cards, opening accounts in the bank, receiving compensation amounts through cheques in their name, etc. This will further widen the perspective of participation by the women in the project implementation. While registering properties make sure they are registered in both the spouses names.
- Provide separate trainings to women groups for upgrading the skill in the alternative livelihoods and assist throughout till the beneficiaries start up with production and business.
- Initiate women's participation through Self-Help Group formation in each of the villages benefitted by the project. These groups can then be linked to special development schemes of the Government.
- Encourage women to evaluate the project outputs from their point of view and their useful suggestions should be noted for taking necessary actions for further modifications in the project creating better and congenial situation for increasing participation from women.
- Devise ways to make other vulnerable to participate in the project activities.

All these done in a participatory manner might bring sustainable results in terms of income restoration of women as a vulnerable group.

12.2.5 Women and Vulnerable's Involvement during Construction

Wherever possible, women's involvement in construction activities should be encouraged in order to help them have access to benefits of project activities. The construction works starts after the R&R activities are over and sites are clear of any encroachment and other encumbrances. The construction contractors set up their construction camps on identified locations, where labour force required for the construction activities will be provided with temporary residential accommodation and other necessary infrastructure facilities. The labour force required for the construction activities has to be of a skilled nature, as there is a lot of mechanised work in construction of sub-projects. In addition, there is also a requirement of unskilled labour. Women certainly contribute, both as skilled and unskilled.

Apart from this, women as family members of the skilled and semi-skilled labourers, will also stay in the construction camps and will be indirectly involved during the construction phase. The families of labourers will include their children also. The construction contractors are expected to bring along skilled labour whereas local labour available will be used for unskilled activities. The labour force, both migratory as well as local will have male as well as female members.

12.2.6 Ensuring Facilities in Construction Camps

Foreseeing the involvement of women, both direct and indirect in the construction activities, PMU shall ensure certain measures that are required to be taken by the construction

contractor towards welfare and well-being of women and children during the construction phase such as:

(a) **Temporary Housing:** During the construction, the families of labourers/workers should be provided with residential accommodation suitable to nuclear families.

(b) **Health Centre:** Health problems of the workers should be taken care of by providing basic health care facilities through health centres temporarily set up for the construction camp. The health centre should have at least a doctor, nurses, General Duty staff, medicines and minimum medical facilities to tackle first-aid requirements or minor accidental cases, linkage with nearest higher order hospital to refer patients of major illnesses or critical cases. The health centre should have MCW (Mother and Child Welfare) units for treating mothers and children in the camp. Apart from this, the health centre should provide with regular vaccinations required for children.

(c) **Day Crèche Facilities:** It is expected that among the women workers there will be mothers with infants and small children. Provision of a day crèche may solve the problems of such women, who can leave behind their children in such a crèche and work for the day in the construction activities. If the construction work involves women in its day-night schedules, the provision of such a crèche should be made available on a 24-hour basis.

The National Curriculum Framework 2005

CBSE, acting under NCERT's directives, has designed a kit on gender sensitivity. It includes a handbook, cards and a manual for teachers to equip them with required skills to practice gender-sensitive learning. This curriculum prioritizes gender-sensitive education as a means to attaining quality education. These should be included in all schools, especially in projects ULBs to cultivate a gender-sensitive culture.

The crèche should be provided with at least a trained ICDS (Integrated Child Development Scheme) worker with '*Ayahs*' to look after the children. The ICDS worker, preferably women, may take care of the children in a better way and can manage to provide nutritional food (as prescribed in ICDS and provided free of cost by the government) to them. In cases of emergency, a trained ICDS worker can tackle the health problems of the children much more efficiently and effectively and can organise treatment linking the nearest health centre.

(d) **Proper Scheduling of Construction Works:** Owing to the demand of a fast construction work, it is expected that a 24 hours-long work-schedule would be in operation. Women, especially the mothers with infants, should to be exempted from night shifts as far as possible. If unavoidable, crèche facilities in the construction camps must be extended to them in the night shifts too.

(e) **Education Facilities:** The construction workers are mainly mobile groups of people. They are found to move from one place to another taking along their families with them. Thus, there is a need for educating their children at the place of their work. Wherever feasible, day crèche facilities may be extended with primary educational facilities or some kind of informal education facilities could be created at the construction camp.

(f) **Control on Child Labour**: Minors, i.e. persons below the age of 14 years, should be restricted from getting involved in the constructional activities. It will be the responsibility of PMU and social and environmental Experts of PMU and environmental and social experts of CMUs to ensure that no child labourer is engaged in the activities. Exploitation of women is very common in such camps. PMU and CMUs shall keep strong vigilance to ensure cessation of such exploitation.

(g) **Special Measures for Controlling STD, AIDS:** Solitary adult males usually dominate the labour force of construction camps. They play a significant role in spreading sexually transmitted diseases. In the construction camps as well as in the neighbouring areas, they are found to indulge in high-risk behaviour giving rise to STDs and AIDS.

While it is difficult to stop such activities, it is wiser to make provisions for means of controlling the spread of such diseases. PMU and CMUs should conduct awareness camps for the target people, both in the construction camps and neighbouring villages as well. PMU shall have to tie up SACS for awareness and IEC materials, and supply of condoms at concessional rate (or free) to the male workers may help to a large extent in this respect.

12.2.7 Other Actions

- Cases of compensation to vulnerable should be handled with care and concern considering their inhibited nature of interaction.
- All compensations and assistances would be paid in a joint account in the name of both the spouses; except in the case of women headed households and women wage earners.
- CMUs shall prepare a list of able bodied and willing women PAFs for constructional activities and hand over the same to contractors.
- Half (subject to a minimum of one third) of the PMU/ CMUs/ PMC staff and all other involved agencies (including consulting agencies) staff should be woman. When qualified/ skilled women are not available, women with lesser qualifications/ skills may be employed and trained. They may be encouraged and facilitated to obtain the necessary qualifications and/ or skills during the employment. The proposed women personnel shall be available to work at site for at least 50% of the duration of the contract. Women may be replaced during the period of contract, only with women persons of equivalent qualifications and experience.
- Same wage rate for men and women must be ensured.

- Scheduled tribe population identified should be given first preference in selection for any project benefit, viz., livelihoods, etc.
- The petty contracts arising out of the sub-project should considered entrusting to SHGs on community contract basis.
- While selecting community members for training at least half of them should be women and vulnerables.

The PMU and CMUs should set up action centers with help lines for missing children, migrants, women in distress, etc. the Nodal Officer in charge of Grievance Redress should be made in charge of this.

13 Citizen Engagement, Consultations and Disclosure

13.1 Introduction

The assessment indicates that many programs and schemes exist for urban and rural development and tribal development, however communication on community awareness of these programs is rather limited. Engagement tends to be more focused on individuals rather on community groups, as would be required in some of interventions under this project. Therefore, in a project of this nature involving beneficiaries across different social groups, a citizen engagement strategy is needed to engage with them to ensure intended outcomes are achieved. The system developed for citizen's engagement will provide project beneficiaries, as well as concerned citizens and civil society space to provide feedback on the project. As an accountability measure, offline and online mechanisms will be created for receiving citizen's feedback. This feedback will be systematically analyzed and used to inform the overall project implementation strategy. The awareness generation effort of the project will also include informing people about ways of providing feedback- like web portals and toll free helplines. Key elements of this strategy are:

13.1.1 Participatory planning, implementation and monitoring

Some of the project interventions such as project screening and planning and implementation would involve all stakeholders. In such exercises, inclusion and involvement of all social groups at all stages of planning, implementation and monitoring would be made mandatory. For this purpose, meetings will be conducted to ensure representation of all such groups besides recording their attendance by category/group. Continuous process monitoring would lay emphasis on quality of interactions during such meetings.

In addition to use of different community monitoring tools like community monitoring will be conducted to assess community perception about the project activities and seek their feedback. The project strategy also includes involving local communities in monitoring disbursement of entitlements to the affected person due to project before start of construction activities if any.

13.1.2 Feedback - ICT

Feedback from beneficiaries, complaints or grievances would be recorded through innovative use of ICT systems. Such information would be collated at the district level for usage in planning and implementing and further reporting to PMU.

13.1.3 Support to grievance redressal

Project information dissemination, awareness creation among the direct and indirect stakeholders would also include creating awareness about available grievance redressal

system that can be used for providing feedback. Regular interaction with the communities for their feedback on project interventions and impact mitigation/ management measures would be taken up.

13.2 Public Consultation and Disclosure

PMU would engage consultants to assist them in implementing the sub-projects. In the ToR for these consultants, there is an explicit requirement for the consultants to carry out public/ stakeholder consultations. This is a mechanism to ensure the upfront public/ stakeholder inputs during (preparation and) implementation of the sub-projects. For all sub-projects, PMU would have to direct the consultants to preparing the DPRs/ EMP/ SMP/ RAP/ ARAP/ TPP to involve all the stakeholders and conduct consultations. In the ToRs for the preparation of these outputs, public/ stakeholder consultations form an integral part. For such type of sub-projects obtaining consent of the local agencies and necessary clearances from competent authorities is mandatory and should form part of the preparation of DPRs/ EMP / SMP/ ARAP/ TPP. These outputs will be reviewed by the AIIB.

During sub-project implementation ULBs and Community Based Organizations (CBOs) will be involved. Project monitoring reports would be disseminated in the public consultation meetings in the ULBs. The stakeholder meetings would discuss the sub-project progress reports and make recommendations for sub-project control and mid-course corrections/ modifications. These recommendations would be made use for future sub-project design.

Consultations are required for preparation of all safeguards mitigation documents and these consultations should be an on-going activity over the life of the project. These would be documented in the DPRs, EIA/ SIA, EMP / SMP/ RAP/ ARAP/ TPP for each sub-project.

13.3 Key Stakeholders

The following are key stakeholders of the proposed project.

- General Users
- Served
    a. Authorized HH connection users
    b. Unauthorized HH connection users
    c. standpost users/ Public Hand pump users
- Unserved
    - Income
        a. upper income
        b. middle income
        c. low income
        d. slum dwellers
    - Women
    - SC/ST and Vulnerables
    - Industry and Commercial

- Political Representatives
    a. Corporators
    b. Local MLAs and MP
- Local NGOs
- Resident Associations and CBOs
- Bureaucracy
    a. ULB Staff
    b. PHMED Staff
    c. APUFIDC Staff
- Private Water Operators
- Septage Tank Cleaners
- Others Affected by Sub-Projects

The above are the probable stakeholders of the sub-projects under APUWSSMIP. Any ESIA to be conducted for any of the sub-project should to an analysis by mapping Key Expectations, Impacts, Issues and Concerns as related to each stakeholder and the subgroups thereof. This Stakeholder analysis will be done using the process like Key Stakeholder Identification, Stakeholders Interests Assessment, Stakeholders Influence Assessment and Stakeholders Importance Assessment.

13.3.1 Stakeholder Engagement Plan

The Stakeholder engagement plan is given below:

Table 13-1: Stakeholder Engagement through the Project Cycle

S. No.	Project Cycle Phase	Actions to be Taken	Responsibility
1	Planning (This phase includes pre-planning and planning phases. The activities include undertaking feasibility studies, concept reports, inception reports, plan of operations, etc.)	To ensure effective stakeholder engagement it would need the following actions (these are detailed in the below sections): ➢ Conducting transect walks in each of the ULBs along with the key stakeholders o the ULB ➢ Collecting data on the socio- economic characteristic of the stakeholders groups. ➢ Organizing consultation with stakeholders. ➢ Analyzing data (secondary and primary) to identify key stakeholder groups' concerns and ways of tackling them. ➢ Mitigating probability and risk of displacement/ land alienation and devise ways to mitigate the impact on people's lives; livelihoods; compensation etc. engaging the concerned stakeholder groups in deriving these mitigation measures. ➢ Conducting stakeholder consultation workshops for each ULB at least once before taking up civil works. ➢ Formation of Grievance Redressal Committee at the ULB level.	• PMU • CMU • PMC
2	Procurement (Activities under this phase include	The bidding documents should include statutory requirements related to the following:	• PMU • CMU

	Pre-qualification of consultants and contractors, bidding, contract awards, etc.)	➢ SMP and requirements such as Project Information Board, etc.	
3	Implementation (This key phase includes Executing the projects, construction, supply of goods and equipment, commissioning, etc.)	This is a key phase where important actions need to be taken. Some of the actions are listed briefly below. Other details are given in the subsequent sections below this table. ➢ Ensure that the key stakeholders are consulted and invited to participate in project activities, to gain jobs and control over the resources, along with proper scheduling of construction works. ➢ Ensure at least two consultations per year at ULB level and two at the ward level during implementation. ➢ Ensure that that the PAFs are provided identify cards, helped in opening accounts in the bank, receiving compensation amounts through cheques/ online payment in their names. ➢ Ensure that pamphlets are distributed in advance before the laying of pipelines. ➢ Ensure that announcements are made about the inconveniences due to laying of pipelines. ➢ Ensure the GRM is working and being updated on a regular basis. ➢ Encourage participation of local labour. Maintain labour register with all these details. ➢ Train key stakeholder groups' representatives in environment and social issues.	• PMU • CMU • Contractors • PMC • Independent External Environment And Social Audit
4	Operation and Maintenance (Operation of facilities and their repair, maintenance (preventive maintenance, corrective maintenance and breakdown maintenance), some augmentation, etc.)	The actions to be taken during this phase are: ➢ Encourage local groups to participate in the operation and maintenance activities. ➢ Train local people to match the skills required for O&M activities. ➢ Where possible assign O&M contracts to locals. ➢ Build capacity of local people to take up O&M functions. ➢ Conduct an Impact Assessment of Social Actions (implementation of SMP, RAP/ ARAP, TPP, etc.) taken.	➢ PMU ➢ CMU ➢ Contractors ➢ PMC
5	Transference (Activities include documenting lessons learnt, dissemination of findings, incorporating these into future projects design, etc.)	The actions to be taken during this phase are: ➢ The Project Completion Report to have an exclusive chapter on Stakeholder Engagement. ➢ This section in PCR to capture the implementation outcomes of stakeholder engagement strategy. ➢ Dissemination of PCR findings for adoption by future projects. ➢ Conduct experience sharing workshops/ seminars with sector agencies.	• PMU • PMC consultants • AIIB

13.4 Public Consultation

Samaj Vikas Development Support Organisation has prepared Environmental and Social Management Planning Framework, Tribal Population Planning Framework and Resettlement Policy Framework for Andhra Pradesh Urban Water Supply and Sepatge Management Improvement Project (APUWSSMIP). It is the policy of the project to disseminate the study findings to the stakeholders. A Public consultation meeting was held on 12th September 2018 at Conference Hall, CDMA, Gorantla village, Guntur. The details are given in ***Annexure 9***. The feedback from this public consultation is incorporated in to this ESMPF.

13.5 Disclosure

13.5.1 State Level

PMU and the CMUs shall disclose this entire ESMPF and all Safeguards related documents and mitigation plans, viz., EIA, SIA, EMP, SMP, RAP/ ARAP, TPP, etc. at their website. These need to be translated into local language (Telugu) and placed on the website. The Resettlement Policy Framework will be disclosed along with the entitlement matrix, though this is a part of the ESMPF, these documents shall be separately identified and disclosed in the PMU website. The TPPF will also be disclosed by the PMU and CMUs. These executive summaries of these two documents shall also be translated into Telugu and made available at the PMU's website.

13.5.2 ULB Level

PMU will also arrange to disclose the final versions of the ESMPF, EMP, SMP, TPPF and RPF along with Entitlement Matrix, in English and the Executive Summaries in Telugu and English, in all the Municipal Commissioner Offices, CMUs, PMU and the local offices of the implementing agencies. These would be in place once the final versions are ready. When this document is updated, then the copies in the different locations would also be updated.

13.5.3 Disclosure by AIIB

The AIIB will disclose this ESMPF along with RPF and TPPF, EMP, SMP, any RAP/ ARAP and TPP for reference to interested parties. During the implementation phase, all the project EIAs and SIAs shall be disclosed by PMU and the CMUs both at the local level and at the state level.

13.6 Comprehensive ESMPF Review and Updation

APUWSSMIP would undertake one thorough/ comprehensive review of the ESMPF during the project period. Based on the review, the ESMPF would be updated if necessary. APUWSSMIP would undertake this review and revision prior to mid-term review by the AIIB. Any revision of this ESMPF will have the concurrence of the AIIB.

14 ESMPF Budget

14.1 Introduction

The total administrative budget for environmental and social management activities under the APUWSSMIP has been worked out as Rs. 2.5 Crores. The cost of implementing the proposed mitigation measures is not included in this costing. The cost of mitigating environmental and social impacts need to be included in the respective sub-projects' budgets. The detailed breakup of the administrative budget is presented in the table below.

Table 14-1: Administrative budget for ESMPF activities

S No.	Activity	Amount in Rs.
1	Training and workshops (as estimated)	**70,00,000**
2	Community Mobilization Staff Costs (lump sum)	**5,00,000**
3	Preparation of specific environment and social related community awareness materials (lump sum)	**10,00,000**
4	Environmental and Social Monitoring	**50,00,000**
5	Independent External Environmental and Social Audit	**75,00,000**
6	Sub Total	**2,10,00,000**
7	Contingencies @ 10%	**21,00,000**
8	**Total**	**2,31,00,000**
	Say	**Rs. 2.5 Crores**

Annexure 1: Environment and Social Data (ESD) Formats

A. Environmental Screening

Part a: General Information

1. Location of the sub-project		
Name of the sub-project		
Name of ULB		
District		
Mandal		
GPS Coordinates of Source – Intake Well	X -	Y -
GPS Coordinates of the Raw Transmission Line	Start	End
GPS Coordinates of WTP	X:	Y:
GPS Coordinates of Distribution Mains	Start	End
GPS Coordinates of ELSR	X:	Y:
Planned Water Intake from Source (MLD and m^3/day)		
Submergence Area (if any) in ha		
2. Implementing Agency Details		
Name of the Department/Agency		
Name of the designated contact person		
Designation		
Contact Number		
E-mail Id		

Part b: Environment Screening

Question	Yes	No	Details
A. Is the location of the Supply Network is within 1Km from following environmentally sensitive areas?			
1. Type of Terrain (Plain/Hilly/ Mountainous etc.)			If yes, (Explain the topography of the area and length of Network in hilly area)
2. Coastal Area			If yes, mention name and distance.
3. National Park			If yes, mention name and distance.
4. Wildlife/Bird Sanctuary			If yes, mention name and distance.
5. Tiger Reserve/Elephant Reserve			If yes, mention name and distance.
6. Wetland			If yes, mention name and distance.
7. Natural Lake			If yes, mention name and distance.
8. World Heritage Sites			If yes, mention name and distance.
9. Archaeological monuments/sites (under ASI's central/state list)			If yes, mention name and distance.
10. Reservoirs/Dams			If yes, mention name and distance.
B. Does the network pass through any of the sensitive sites or located along the site and distance to this site?			
1. Whether Water Supply Network passes through or along the inhabited area?			If yes, list them indicating the location (right or left side) and the coordinates
2. Whether WS Network passes through or along the agriculture land?			If yes, indicate the location (right or left side) and the coordinates
3. Whether WS Network passes through or along the Grazing land?			If yes, list them indicating the location (right or left side)
4. Whether WS Network passes through or along the Barren land?			If yes, list them indicating the location (right or left side) and the coordinates

Question	Yes	No	Details
5. Whether WS Network passes through Reserved/Protected Forest or located along the forest?			If yes, indicate the location (right or left side) and the coordinates
6. Are there any areas with landslide or erosion problems along the WS Network?			If yes, indicate the location (right or left side) and the coordinates
7. Are there any lakes/swamps beside the WS Network?			If yes, list them indicating the location (right or left side) and coordinates
8. Are there any nallas/streams/rivers etc. along/crossing the WS Network?			If yes, list them indicating the location (right, left or crossing) and the coordinates
9. Are there problems of water stagnation and other drainage issues on or near the WS Network?			(If yes, mention coordinates)
10. Is the area along the project prone to flooding?			If yes, mention flood level and frequency
11. Within 100 meter of the WS Network is there any area with threatened/rare/ endangered fauna (outside protected areas)			If yes, indicate the location (right or left side) and coordinates
12. Within 100 meter of the WS Network is there any area with threatened/rare/ endangered flora (outside protected areas)			If yes, location (right or Left side) specify details of habitat with coordinates
13. Within 100 meter of the WS Network is there any Habitat of migratory birds/ animal (outside protected areas)			If yes, location (right or Left side) specify details of habitat with coordinates
14. Within 100 meter of the WS Network is there any area Historic Places (not listed under ASI – central or state list)			(If yes, indicate the location (right or left side) and the coordinates
15. Within 100 meter of the WS Network is there any area Regionally Important Religious Places			(If yes, indicate the location (right or left side) and coordinates)
16. Are there any utility structures(Public Water Supply Areas, Hand pump, Electric pole, telephone pole, cables etc.) within 10 m on either side from the WS Network alignment			(If yes, list all the utilities structures indicating the location (right or left side) and the coordinates)
17. Is there is need to cut trees for WS Network alignment/construction?			(If yes, indicate the location (right or left side) and coordinates)
▪ **Information related to impact:** **C. Will the construction, operation or decommissioning of this** WS Network **cause changes to or have impact on the following?**			
1. Will this construction cause any disfiguration of landscape embankment, cuts, fills and quarries?			If yes, please give details
2. Will there be any Landslide/Soil erosion at construction site?			If yes, please give details
3. Will the construction and maintenance cause any sedimentation nearby river or stream?			If yes, please give details
4. Will there be any impact on Air – dust during construction, crushing etc.			If yes, please give details
5. Will there be any Solid waste/sanitary waste disposal at construction camp and work sites causes			If yes, please give details
6. Noise/ vibration/ light/heat energy/ electromagnetic radiation during construction			If yes, please give details
7. Will there be any accident due to increased traffic during construction			If yes, please give details

Question	Yes	No	Details
8. Will there be any health issues like communicable diseases, respiratory problems and stress near project area?			If yes, please give details
9. Any other			If yes, please give details

Part C: Transect Walk Map

While filling in this data sheet, the implementing agency should hold a consultation with the local community through the ULB in order to determine the most suitable alignment, sort out issues of land availability (including forest land), moderate any adverse social and environmental impacts and elicit necessary community participation in the programme. For this purpose the implementing agency should organise an informal 'Transect Walk' and prepare a map (Not to Scale) of this and attach the same to this data sheet. The following points should be borne in mind while preparing this map.

- The Transect walk shall be undertaken by the Officer filling in this data sheet, accompanied by the Commissioner of the ULB/ Ward Member and other community members after adequate advance publicity. The local Forest official may also be associated if forest land is involved.
- During the Transect Walk, issues relating to land requirements for the WS Network and its impact on landowners, encroachers, squatters, etc. need to be discussed with members of the local community present. Collect all land related revenue records, maps and gazettes for supporting the claims and attach to this report. To this check list attach a typical cross section of the structure at its widest and note the land required.
- Environmental impact on vegetation, land, soil and water etc. shall be identified and noted for resolution.
- During the walk, due opportunity shall be given to interested persons to put forward their points of view.
- At the end of the walk and after recording the issues that arose during the walk, the action taken/ proposed to resolve the issues be noted. This shall be recorded by the Commissioner of the ULB and countersigned by the Chairperson/ Ward Member. A copy of this document shall be attached to the data sheet.
- During or after (as convenient) the Transect Walk, a map (Not To Scale) with the WS Network and road alignment, the environmental features along the Network, ownership of land need to be prepared. Identify all structures, viz., places of worship, schools, hospitals and other common property resources, forest land, etc. and locate on this Transect Walk Map.
- To this map attach some (a minimum of four on right side and four on left side and one each at the beginning and ending) photographs showing and highlighting the most critical places.

Part d : Result/Outcome of Environmental Screening Exercise		
1.	EIA Required	Yes/ No

2.	Regulatory Clearance Required	Forest: …….. CRZ: …… Wildlife ……. Irrigation: ……... Otters (if any): ……

B. Social Screening

1. Land Requirement

Details	Unit	Quantity	Classification/Category	Present Use and User
Government Land				
Private Land				
Forest Land				
Title Holder				
Non-titleholders (Encroacher)				
Non-titleholders (Squatter)				
People losing livelihoods/ access due to loss of Govt. Lands to Project				

2. Agriculture Land affected

Details	Unit	Quantity
Total Affected	Number	
Title Holders	Number	
Non-titleholders (Encroacher)	Number	
Non-titleholders (Squatter)	Number	
BPL Families losing Agriculture Land	Number	

3. Dwellings (Residential) affected due to sub-project

Details	Unit	Quantity
Title Holders	Number	
Non-titleholders (Encroacher)	Number	
Non-titleholders (Squatter)	Number	
Total Affected	Number	
BPL Families losing Dwellings	Number	

4. Commercial properties

Details	Unit	Quantity
Total Affected	Number	
Title Holders	Number	
Non-titleholders (Encroacher)	Number	
Non-titleholders (Squatter)	Number	
BPL Families losing Commercial Properties	Number	

5. Common Property Resources Affected: (Please give each type by number)

Type	Unit	Quantity
	Number	
	Number	

	Number	
	Number	
	Number	

1	Total no of HH affected due to proposed project activity (Single or multiple impacts)	Results
2	Total no of vulnerable HH affected due to proposed project activity (Single or multiple impacts)	
3	Total number of Community Property Resources affected	

Part C: Result/Outcome of Social Screening Exercise

1	No SA Require	
2	SA Required	

Annexure 2: Terms of Reference to Carry out Environmental Assessment Studies

1.0 Brief Introduction

A brief introduction to the project shall be provided in this section.

2.0 The Project Area and Setting

A brief description of the project area / city and salient features of the city shall be presented in this section.

3.0 The Project Objectives and Need

A brief profile of the existing water supply system in the project city, service levels, problems & issues and salient features of the proposed project shall be discussed in this section along with the environmental implications of the proposed project.

4.0 Scope of Work

The scope of work shall clearly specify various activities to be performed by the environmental consultant, surveys to be carried out, and other requirements of the study. The following sections list out various tasks to be performed by the environmental consultants in conducting Environmental Impact Assessment for the project.

Task 1 Description of Project

A full description of the proposed project shall be provided in this task. This shall include an analysis of the existing water supply situation in the project city and a description of each of the proposed components such as intake structures, treatment plant, transmission main, pumping station, storage reservoirs, distribution network, etc. The task shall also bring out the rational, the need for the proposed project and list out the various benefits of project implementation. As part of this activity, the consultant shall provide necessary maps to scale.

Task 2 Review of Earlier Studies

The environmental consultants shall review various earlier studies such as feasibility and detailed project reports, etc., of the project and understand the project and various aspects associated with the same. A review of the studies carried out on the environmental aspects of the project area shall also be carried out. This shall provide a base to formulate the environmental surveys necessary for the project and assessing impacts of the same.

Task 3 Legislative and Regulatory Considerations

A review of the legal and regulatory provisions applicable for the project shall be carried out in this task. The objective of the review is to bring out the legal and policy issues to be addressed in the project at various stages of project development such as planning, design, execution and operation. In addition to the environmental laws such as EP Act, Water Act, Air Act, etc., the consultants shall review applicable policies of AIIB

The review shall thus provide a complete list of regulatory formalities required for the project and various clearances required from different regulatory agencies including State Pollution Control Board.

Task 4 Preparation of Environmental Profile

An environmental profile of the project influence area shall be prepared, based on appropriate primary & secondary surveys and field investigations. The objective of this profile is to establish existing environmental conditions of the project area, in terms of air, water, noise, soil and other environmental parameters, which should form the basis for prediction of impacts due to proposed project activities. As part of this, the environmentally sensitive land uses (protected natural areas, areas of ecological value, sensitive receptors like schools, hospitals etc) would also be identified and plotted on a map to scale.

The extent and duration (atleast one season for rapid assessment and the three seasons for full detailed assessment) of surveys shall be judiciously decided by the consultant as per requirements of the environmental regulations applicable in India and guidelines of international funding agencies. The profile prepared shall be adequate enough to predict impacts of the project and shall cater to the requirements of obtaining necessary environmental clearances from the authorities.

The profile shall essentially include all physical, ecological and socio-economic components of the project environment and bring out the salient and sensitive features of the same. Important aspects such as reserve forests, national parks, major water bodies, structures of archaeological / historic importance, and other environmental resources (if any) shall be identified and salient features of the same shall be presented.

In addition to the basic environmental profile, quality of water supplied by the present water supply system, potential points of cross contamination and health profile of the project area population shall also be brought out in detail through appropriate sampling surveys and field investigations.

Detailed activities to be carried out under environmental assessment is given under section 5.0

Task 5 Determination of Potential Impacts

Based on the environmental profile of the project area prepared above and the proposed project activities discussed under Activity 1, the consultants shall carry out environmental screening to determine the nature of impacts and level of Environmental Assessment to be carried out (Section 5.0 provide the details to be carried out).

- In case of low or insignificant level of impacts, where an EMP will suffice, the consultant shall review the recent versions of generic EMPs available with APUWSSMIP and carry out necessary changes to suit the project requirements.
- As part of screening, if medium to high impacts, requiring a detailed EA and standalone EMP is required, the consultant shall carry out detailed impact analysis. The consultant

shall predict environmental impacts of the project components, activities and sub-activities on various environmental attributes (bio, geo and physical) through appropriate analytical tools and techniques such as modelling techniques, over lays, etc. Significant or insignificant, permanent or temporary, reversible or irreversible, negative or positive impacts shall be categorised separately and presented for each phase of project development.

All identified impacts shall be summarised in an easily understandable format and the magnitude and significance of each impact shall be explained in detail.

An analysis of various project alternatives, including the 'Project' and 'No Project' scenario shall be brought out and impacts shall be analysed for each scenario. Based on the above analysis the best alternative that causes minimum or no impact shall be recommended for implementation.

Task 6 Stakeholder Consultations

The consultants shall carry out consultations with Experts, NGOs, forest department (if applicable) and other selected Government Agencies and other stakeholders to (a) collect baseline information, (b) obtain a better understanding of the potential impacts (c) appreciate the perspectives/concerns of the stakeholders, and (d) secure their active involvement during subsequent stages of the project as appropriate .

Consultations shall be preceded by a systematic stakeholder analysis, which would (a) identify the individual or stakeholder groups relevant to the project and to environmental issues, (b) include expert opinion and inputs, (c) determine the nature and scope of consultation with each type of stakeholders, and (d) determine the tools to be used in contacting and consulting each type of stakeholders. A systematic consultation plan with attendant schedules will be prepared for subsequent stages of project preparation as well as implementation and operation, as required. Where community consensus is required in respect of proposed mitigation measures for impacts on community assets including water bodies, places of worships etc., specific plan for modification/relocation etc have to be disclosed and consensus obtained.

Task 7 Development of an Environmental Management Plan / Determination of Mitigation measures

The consultants using outputs of the above tasks shall develop an implementable Environmental Management Plan (EMP) for the project. Development of an Environmental Management Plan is detailed under Section 6.0 below

Environmental Screening and EA activities to be carried out in detailed

<u>Environment Screening</u>

1. Environmental screening shall be undertaken to identify the environmental hot spots along the project corridors and determine the level of environmental analysis required

for the EA. The consultant consultants shall carry a preliminary analysis to assess the nature, scale and magnitude of the impacts that the project is likely to cause on environment. In case of significant environmental impacts encountered (may be applicable to the entire project/specific project interventions/specific locations), The consultants shall explore possible alternatives to the project and/or project components in a consultative manner. The deliverable at this stage will be Environmental Screening Report.

2. The screening exercise shall be supported through secondary and primary information collection and, stakeholder consultations on existing environment scenario. As part of the screening the consultants shall:

-

a) Identify sensitive locations in the project area including regionally or nationally recognized environmental resources and sensitive manmade land uses like hospitals, schools, etc
b) Establish baseline environmental quality with regard to air, water and noise at sensitive receptors.
c) List and map common property resources such as roadside trees; forests, large water bodies; and major physical cultural properties, etc.
d) Identify Human settlement, physical infrastructure and project activities that would result in severance.

5.2 Project EA

1. Existing Environment and Baseline Conditions: Baseline assessment shall be carried out based on the outcome of Environmental Screening carried out for the project. The baseline conditions shall be established through detailed primary level field surveys. At this stage the consultants shall prepare detailed maps showing candidate sites for environmental improvements. The specific tasks under this include:
2. Data Collection: Data shall be collected on relevant physical, biological and socio-economic conditions to establish the current environmental status of the project area. The data collection should be undertaken to arrive at meaningful information that will facilitate assessment of impacts and preparing management plan. Broadly, the following form of the data categories shall be covered (the consultant is also encouraged to use professional judgement and local knowledge in defining other data requirements):

The current land uses at the proposed project site and the study area using maps plotted to appropriate scale, covering: lakes/ponds and their uses, forests and its classification, ecologically sensitive areas (sanctuaries, national parks, wildlife corridors, identified areas of nesting, mangroves and / or of interest of migratory birds, etc.), prominent land marks, sensitive receptors, community severance, village settlements, agricultural lands, pasture and barren lands, various categories of CRZ areas if any, etc.

Physical - Geology, topography, soils, climate and meteorology (with emphasis on critical season considering water bodies and air quality), ambient air quality, surface and groundwater hydrology, existing sources of air emissions, existing water quality status of water bodies of importance.

3. Biological and Ecological assessment covering water bodies, fauna & flora, ecologically sensitive areas (perceived as well as officially listed).
4. Based on the outcome of screening report, the consultants shall carry out additional air and noise quality monitoring, which in future may depict the base line conditions for EMP monitoring. Critical areas of environmental importance: shall be identified as an output of the current environmental status of the project sites

5. Impact Prediction: The Consultant shall identify positive and negative impacts likely to result from the proposed project, interpreting "environmental" throughout the EA to include socio-economic impacts as well as impacts on the natural environment. All the project activities during pre-construction, construction and operation phases shall be considered to assess the impacts. The impact assessment shall necessarily cover "no action" alternative in the analysis. The consultants shall regularly interact with technical and social team of the project to share the findings of the impact assessment. The assessment of environmental impacts shall necessarily cover (but not limited to) the following:

(a) Impacts on the water bodies
(b) Impacts on topography and surface drainage in the project area,
(c) Community and cultural severance, identified through consultations
(d) Expected changes in the land use patterns along the proposed alignment and the associated impacts
(e) Impact on ecologically sensitive features including nesting and area of interest for avifauna in and around water bodies, etc.
(f) Impact on Socio-economic aspects of the projects area
(g) The environmental aspects, which are not relevant and do not require further attention in the project cycle of the project should be specified. For this purpose, consultant shall link the findings of screening/scoping exercise
(h) The air pollution predictions where ever necessary using relevant mathematical models and recent meteorological trends
(i) The noise impacts on sensitive receptors shall be assessed using relevant models
(j) Any impacts that are irreversible and/or cannot be avoided or mitigated should be identified

6.0 Environmental Management Plan

The consultant shall prepare a detailed EMP covering the measures to mitigate and/or minimize the negative impacts, including the implementation arrangement and a monitoring plan for the same. EMP shall cover the following details:
(a) Mitigatory measures: For each of the significant negative impact the consultant should recommend measures to eliminate and or mitigate the impact. In case any impact is non-mitigable, the cost of damage shall be estimated. The cost (capital and recurring) of all the mitigation measures and the responsible parties for implementation should be clearly identified. Wherever possible the measures should be drafted as contract clauses, which can be incorporated in construction/operational, phase agreements. The mitigatory

measures should necessarily contain conceptual designs wherever necessary. The consultants should also specify neighbourhood committees to supervise effective implementation of the proposed mitigatory measures.

(b) Environmental Codes of Practices (ECOPs): As part of mitigating impacts during construction phase of the project, the consultants shall provide ECOPs, which shall be followed as part of standard practice during construction period.

(c) Landscape plan: Wherever necessary, the Landscaping plan should be prepared considering the project area as a whole and shall meet project specific requirements. The landscaping elements shall comprise of signages, green-belt development, special contouring and dense green area needs for attenuation of noise and air pollution, integration of aesthetics, etc. Considering the nature of the project area, the EA should provide a conceptual landscape plan for all the project components while considering the special environmental and social needs

(d) Budget Estimates: The EMP budget estimates shall be prepared for each of the project component and the shall be integrated with the overall project cost estimates

(e) Monitoring Plan: The Consultant should specify the types of monitoring needed for potential environmental impacts during construction and operation. As in the case of the mitigation plan, requirements should be specific as to what is to be monitored, how and by whom. Cost estimates are necessary and where monitoring reports are to be prepared, the recipient responsible for review and any corrective action should be identified. The monitoring plan should be supplemented with a detailed schedule of implementation of EMP measures

(f) Institutional Arrangement to Manage Environment Impacts Effectively: The consultants shall identify institutional/organizational needs to implement the recommendations of the project EA and to propose steps to strengthen or expand, if required. This may extend to new agency functions, inter-sectoral arrangements, management procedures and training, staffing, operation and maintenance, training and budgeting.

7.0 Public Disclosure

The consultants are to provide support and assistance to the Client in meeting the disclosure requirements, which at the minimum shall meet the AIIB Bank's policy on public disclosure. The consultants will prepare a plan for in-country disclosure, specifying the timing and locations; translate the key documents, such as the EA Summary in local language; draft the newspaper announcements for disclosure; and help the client to place all the EA reports in the client's website. The consultants shall prepare a non-technical EA Summary Report for public disclosure.

8.0 Inputs to be provided by the Client

The client shall make available all relevant documents, reports in connection to the project area/study area and facilitate procurement of data to the consultants.

9.0 Outputs and Estimated Time Schedule

The study shall be completed within a period of **** months from date of contract and the schedule of deliverables shall be as specified below.

- Inception Report within ** month of date of award of contract
- Interim Report within *** months of date of award of contract
- Draft Report within *** months of date of award of contract
- Final report within *** months of date of award of contract

Annexure 3: Water Quality Analysis Requirements

The main purpose of water quality testing is to assess the quality and classify the raw water to be treated; to determine the need and extent of treatment; to check that water has been properly prepared for each phase of treatment process; to ensure that each phase of treatment proceeds according to plan and to examine the finished water to ascertain that it conforms to the standards.

The other objectives served by regular testing program include (a) determination of trends in drinking water quality over time, (b) provision of information to public health authorities for general public health protection purpose and (c) identification of sources of contamination.

Parameters to be monitored

The potential water contaminants, classified into chemical (organic), chemical (inorganic), microbiological, radiological contaminants.

- Physical parameters – temperature, turbidity (NTU), colour (PtCo), taste and odour, free residual chlorine, dissolved and suspended solids;
- Chemical parameters – acidity, alkalinity as calcium carbonate, pH, hardness (as CaCO3), calcium, chloramine, magnesium, iron, sulphates, sulphides (as H2S), phosphates, silica, fluorides, chlorides, mineral oil, nitrates (as NO3), nitrites (as NO2), phenolic compounds, sodium, potassium, total dissolved and suspended solids
    - Metals such as manganese, copper, zinc, aluminium, barium, boron, selenium, silver, cadmium, lead, mercury, nickel , arsenic, chromium;
- Bacteriological parameters– total coliform bacteria (MPN count), Escherichia coli (E.coli) thermo-tolerant coliform bacteria (MPN count),
- Micro biological parameters–faecal streptococci, algae, zooplanktons, flagellates, cryptosporidium, giardia, cercariae of schistosomiasis, embryos of dracunculus medinensis.
- Pesticides - alachlor, atrazine, aldrin/ dieldrin, alpha HCH, beta HCH, butachlor, chlorpyriphos, delta HCH,2,4- dichlorophenoxyacetic acid, DDT (o, p and p, p – isomers of DDT, DDE and DDD), endosulfan (alpha, beta, and sulphate) ethion, gamma — HCH (lindane), isoproturon, malathion, methyl parathion, monocrotophos, phorate
- Toxicity - cyanide, polychlorinated biphenyls, poly nuclear aromatic hydrocarbons, tri-halo methanes, alpha emitters Bq/l, max beta emitters Bq/l,

The basic minimum parameters that need to be tested at each WTP for establishing credibility of the drinking water supply quality will include pH, turbidity, residual chlorine, alkalinity, iron, total coliforms and E-coli.

Depending on the capacity of Water Treatment Plant (WTP) and available laboratory equipment3, the parameters required to be monitored at each basic laboratory at WTP level as per CPHEEO

Protocol for Sampling

Samples shall be collected from locations that are representative of all the water source(s), treatment plant(s), storage facilities, intermediary points within the distribution network, and points at which water is delivered to the consumer, and points of end-use. Factors such as population density and accessibility shall be considered when choosing sampling locations. A map or sketch of the water distribution system shall be used to locate general sampling locations that give samples representative of various characteristics of the distribution system. Depending on the local context and available resources, a sampling plan for water quality monitoring shall be prepared and implemented at each laboratory. It is important that a written sampling protocol with specific sampling instructions be made available to and used by laboratory staff and other competent sample collectors.

Accurate analysis of water quality sample depends on the factors such as, methods of sample collection, methods of storage and protocol for microbial and chemical analysis, data analysis and interpretation. Inadequate care in undertaking any of these steps leads to inaccurate results and the entire operation will result in wastage of time, energy and resources. The methods of sampling for physical and chemical examinations as well as microbiological examinations of water are prescribed by Bureau of Indian Standards (BIS). The BIS code IS: 3025 (Part-1)-1987 and IS: 1622-1981, may be referred to for detailed information.

The laboratory should reject any sample which does not meet the criteria and ask for a resample. If re-sampling is not possible, the inadmissibility of these sample data need to be clearly communicated to all end data users. Following general precautions may be taken while collecting water samples for testing.

- Collect the sample that conforms to the requirement of the sampling plan and handle it carefully so that the sample does not deteriorate or get contaminated during its transport to the laboratory.
- Before filling the container, rinse it two or three times with the water being collected.
- Representative samples of some sources can only be obtained by making composites of samples collected over a period of time or at a number of different sampling points.
- While collecting a sample from the distribution system, flush lines adequately, taking into consideration the diameter and length of the pipe to be flushed and the velocity of flow.
- Collect samples from tube-wells only after sufficient pumping (purging) to ensure that the sample represents the ground water source.

- When samples are to be collected from a river or stream, analytical results may vary with depth, flow, distance from the banks. In surface water bodies, water samples should preferably be collected at 0.2 times the depth of the water body from the top.
- Make detailed record of every sample collected (with unique code and Global Positioning System coordinates). Identify each container and record information like date, time and exact location and condition.
- Samples shall be kept in a refrigerator or cooler with an ice-pack to maintain a temperature of 4 degree Celsius until delivered to laboratory (Samples should not be frozen). Samples shall be transported to laboratory as soon as possible or definitely within 24 hours of collection. Check ahead with laboratory about sample acceptance to ensure meeting the 24 hour criteria.

When collecting samples at a water source, it is important to collect Global Positioning System (GPS) coordinates and take pictures of (a) intake and surrounding area, (b) dam or water control structure, and (c) pump house or other structures of interest. State may undertake one time survey for recording GPS coordinates of drinking water sources by a suitable agency

Quantity of Sample to be collected
Samples for chemical and bacteriological analysis should be collected separately as the method of sampling and preservation is completely different from each other. The interval between collection and analysis of the sample should be shortest possible.

- Quantity of sample for general analysis: 2 litres (non-acidified).
- Quantity of sample for bacteriological analysis: 250 ml in sterilized bottles.
- Quantity of sample for metals analysis: 1000 ml acidified sample for metal analysis.

Frequency of testing
The laboratories shall mandatorily carry out analysis of at least 13 basic water quality parameters viz., pH, Total Dissolved Solids, Turbidity, Chloride, Total Alkalinity, Total hardness, Sulphate, Iron, Arsenic, Fluoride, Nitrate, Total coliforms and Thermo-tolerant coliform or E-Coli.

State level laboratories shall be utilized for analysis of specific parameters like metals, pesticides, radioactive substances, bacteriological investigation, etc., along with general parameters. To establish the baseline, state level laboratory shall monitor the prescribed drinking water quality parameters at least once in a year. State laboratories may monitor Dissolved Oxygen (DO), Biological Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) in surface water if eutrophication is observed/ reported. These parameters may also be of importance at the downstream of industrial areas/discharge of treated/partially treated/untreated sewage from urban local bodies. Thereafter, depending upon the occurrence of specific parameters in drinking water sources and their local relevance, number of the parameters or frequency of analysis for some parameters may be reduced as deemed appropriate by Government of Odisha.

The divisional and PH laboratories shall carry out testing and analysis of all the prescribed general water quality parameters at least once in pre-monsoon and post-monsoon season to establish a baseline. However, in case of detection of any pollutants, the parameters would need to be analysed
on routine basis. Suggested minimum sampling frequency (prescribed by CPHEEO manual) for water quality monitoring and water quality surveillance is given in tables below.

Suggested Minimum Sampling Frequency for Water Quality Control Monitoring - Surface water

S No	Size and Source	Frequency	Residual Chlorine	Physical	Chemical	Bacteriological	Biological	Metals & Pesticides	As, r+6, Fe & Mn, Fluoride	Remarks
1	a. Raw water, source and intake point	Daily		√	√					
		Weekly				√				
		Annually						√	√	
		Occasional					√			(As & when required)
2	b. Sedimentation tank after clarifier	Daily								Turbidity
		Weekly				√				
		Occasional						√	√	(As & when required)
3	c. Filtered water	Daily								Turbidity
		Weekly				√				
4	d. Clear water storage reservoirs	Daily	√	√	√					
		Weekly	√			√				
5	e. Distribution system	Daily								
		Weekly				√				
		Monthly		√	√					

Note: Refer to the Manual on Water Supply and Treatment, III Edition, Ministry of Urban Development, New Delhi, May 1999, Appendix 15.9, for minimum tests to be performed. Parameters and frequency are general in nature and in case of special situations; they can be altered according to the local conditions by the local authority

Suggested Minimum Sampling Frequency for Water Quality Control Surveillance – Surface Water

S No	Size and Source	Frequency	Residual Chlorine	Physical	Chemical	Bacteriological	Biological	Metals & Pesticides	As, r+6, Fe & Mn, Fluoride	Remarks
1	a. Raw water, source and intake point	Fortnightly				√				
		Quarterly		√	√					
		Annually						√	√	
		Occasional					√			(As & when required)
2	b. Filtered water	Monthly				√				Turbidity only
3	c. Clear water storage reservoirs	Fortnightly	√			√				
		Monthly		√	√					(As & when required)
4	e. Distribution system	Weekly	√							
		Monthly				√				
		Quarterly		√	√					

Note: Refer to the CPHEEO Manual on Water Supply and Treatment, III Edition, Ministry of Urban Development, New Delhi, May 1999, Appendix 15.9, for minimum tests to be performed; and Annexure-9.6c (1) of CPHEEO operation & maintenance manual (2004)

The minimum number of samples to be collected from the distribution system shall be as prescribed in the table below:

Population Served	Maximum intervals between successive sampling	Minimum number of samples from entire distribution system
Up to 20,000	One Month	One sample per 5000 of population per month
20000 – 50000	Two weeks	
50000 – 100000	Four days	
>100000	One Day	One sample per 10000 of population per month

Annexure 4: Monitoring Environmental Parameters

Environmental monitoring is defined as ―an activity undertaken to provide specific information on the characteristics and functions of environmental and social variables in space and time

The environmental monitoring programme will be devised to ensure that the envisaged purpose of the project is achieved and results in the desired benefit to the target population. To ensure the effective implementation of the EMP, it is essential that an effective environmental monitoring programme be designed and carried out. Broad objectives of the monitoring programme will be

- To evaluate the performance of mitigation measures proposed in the EMP
- To suggest improvements in the management plans, if required
- To satisfy the statutory and community obligations

A. Types of Environmental Monitoring

Baseline Monitoring/ Impact Assessment	A survey should be conducted on basic environmental parameters in the area surrounding the proposed project before construction begins (pre-audit study). Subsequent monitoring can assess the changes in those parameters over time against the baseline
Impact Monitoring	The biophysical and socio-economical (including public health) parameters within the project area, must be measured during the project construction and operational phases in order to detect environmental changes, which may have occurred as a result of project implementation
Compliance Monitoring	This form of monitoring employs a periodic sampling method, or continuous recording of specific environmental quality indicators or pollution levels to ensure project compliance with recommended environmental protection standards

The monitoring programme contains monitoring plan for all performance indicators, reporting formats and necessary budgetary provisions. Monitoring plan for performance indicators and reporting system is presented in the following sections.

B. Monitoring Plan for Environmental Conditions

The Environmental monitoring of the parameters involved and the threshold limits specified are discussed below

A. Ambient Air Quality Monitoring (AAQM)

The air quality parameters viz: Sulphur Dioxide (SO2), Oxides of Nitrogen (NOX), Particulate Matter PM10 and PM2.5 shall be regularly monitored at identified locations from the start of the construction activity. The air quality parameters shall be monitored in accordance with the National Ambient Air Quality Standards.

B. Noise Quality Monitoring

The noise levels shall be monitored at designated/ sensitive locations (including Schools, Hospitals etc.) in accordance with the Ambient Noise Quality standards.

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C. Water Quality Monitoring

Water quality parameters such as pH, BOD, Coliform count, Total Dissolved Solids, Oil and Grease etc., shall be monitored at surface water bodies (including lake, pond, open well etc.) located along/ near the project components during the construction stage as per standards prescribed by Central Pollution Control Board and Indian Standard Drinking water specifications IS 10500, 1991.

C. Environmental Monitoring Locations

In addition of the critical locations selected during design stage, the environmental monitoring will also be done at the construction camp site and any other plant site during construction stage. List of critical locations for caring out monitoring should be presented in report

D. Monitoring and Post Auditing

Construction monitoring, including field inspections and surveys, should be carried out by an environmental expert to ensure that environmental protection requirements are being met. The monitoring and reporting is to be in line with the reporting system developed for the project. It is important to plan and budget for environmental construction monitoring as part of the project.

Environment Parameters Standards

A. National Ambient Air Quality Standards

Pollutant	Time Weighted Average	Concentration in Ambient Air	
		Industrial, Residential, Rural and Other Areas	Ecologically Sensitive Area (notified by Central Government)
Sulphur Dioxide (SO_2), μg/m³	Annual*	50	20
	24 hours**	80	80
Nitrogen Dioxide (NO_2), μg/m³	Annual*	40	30
	24 hours**	80	80
Particulate Matter (size less than 10 μm) or PM_{10} μg/m³	Annual*	60	60
	24 hours**	100	100
Particulate Matter (size less than 2.5 μm) or $PM_{2.5}$ μg/m³	Annual*	40	40
	24 hours**	60	60
Ozone (O_3) μg/m³	8 hours*	100	100
	1 hour**	180	180
Lead (Pb) μg/m³	Annual*	0.50	0.50
	24 hours**	1.0	1.0
Carbon Monoxide (CO) mg/m³	8 hours*	02	02
	1 hour**	04	04
Ammonia (NH_3) μg/m³	Annual*	100	100
	24 hours**	400	400
Benzene (C_6H_6) μg/m³	Annual*	5	5
Benzo(a)Pyrene (BaP)-particulate phase only, ng/m³	Annual*	1	1
Arsenic(As), ng/m³	Annual*	6	60
Nickel (Ni), ng/m³	Annual*	20	20

* Annual arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.
** 24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be complied with 98% of the time, they may exceed the limits but not on two consecutive days of monitoring.
Source: National Ambient Air Quality Standards, Central Pollution Control Board Notification in the Gazette of India, Extraordinary, New Delhi, 18th November, 2009

B. Ambient Noise Quality Standards (National)

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

** Daytime shall mean from 6.00am to 10.00 pm and Night shall mean from 10.00 pm to 6.00 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.*

C. Tolerance limits for inland surface waters subject to pollution

Tolerance limits for inland surface waters, Class c (clause 3.3) (IS: 2296-1982)

S.NO	CHARACTERISTIC	TOLERANCE LIMIT	Method of test	
			Ref to Cline in IS:3025-1964 #	Other Method of Test
I)	pH value	6.5-8.5	8	--
ii)	Dissolved Oxygen, mg/l, Min	4	50	--
iii)	Biochemical oxygen demand (5 days at 20° C), mg/l, Max	3	53	--
iv)	Total Coli form Organisms, MPN/100 ml, Max	5000*	--	3.3 of IS: 1622-1981**
v)	Color, Hazen units, Max	300	5	--
vi)	Fluorides (as F), mg/l, Max	1.5	23	--
vii)	Cadmium (as Cd), mg/l, Max	0.01	--	9 of IS:2488 (Part II)-1968##
viii)	Chlorides (as Cl), mg/l, Max	600	24	--
ix)	Chromium (as Cr^{6+}), mg/l, Max	0.05	38	--
x)	Cyanides (as CN), mg/l, Max	0.05	27	--
xi)	Total dissolved solids, mg/l, Max	1500	12	--
xii)	Selenium (as Se), mg/l, Max	0.05	28	--
xiii)	Sulphates (as SO_4), mg/l, Max	400	20	--
xiv)	Lead (as Pb), mg/l, Max	0.1	37	--
xv)	Copper (as Cu), mg/l, Max	1.5	36	--
xvi)	Arsenic (as As), mg/l, Max	0.2	40	--
xvii)	Iron (as Fe), mg/l, Max	50	32	--
xviii)	Phenolic Compounds (as C_6H_5OH), mg/l, Max	0.005	54	--
xix)	Zinc (as Zn), mg/l, max	15	39	--
xx)	Insecticides, mg/l, Max	Absent	--	8 of IS:2488 (Part III)-1968*@
xxi)	Anionic detergents (as MBAS), mg/l, Max	1	--	Methylene blue-extraction method
xxii)	Oils and grease, mg/l, Max	0.1	--	13 of IS:2488 (Part I 1966 $)
xxiii)	Nitrates (a NO_3), mg/l, Max	50	48	--
xxiv)	Alpha emitters, μc/ml, Max	10^{-9}	58	--
xxv)	Beta emitters, μc/ml, Max	10^{-8}	58	--

\# Methods of sampling and test (physical and chemical) for water used in industry.

* If MPN count is noticed to be more than 5000 MPN then regular tests shall be carried out. The criteria shall be satisfied if during a period of time not more than 5 percent of the samples show more than 20000 MPN and not more than 20 percent of the samples show more than 5000 MPN. Further the faucal coliforms should not be more than 40 percent of the total coliforms.

D. Desirable and Maximum Limits of Parameters in Water as per BIS and WHO

Parameter	Units	BIS (IS:10500)-2012		WHO Desirable Limits
		Desirable Limits	Max. Permissible Limits	
pH	——-	6.5 - 8.5	6.5 - 8.5	6.5 - 9.2
Arsenic	mg/L	0.01	0.05	0.01
Fluoride	Mg/L	1	1.5	1.5
E-Coli	Number/	Absent	Absent	Absent
TDS	mg/L	500	2000	1200
Nitrate	mg/L	45	45	50
Iron	mg/L	0.3	0.3	0.3
Calcium (as Ca)	mg/L	75	200	No Specification
Magnesium (as Mg)	mg/L	30	100	No Specification
Sulphate	mg/L	200	400	500
Alkalinity	mg/L	200	600	No Specification
Turbidity	NTU	1	5	10

Annexure 5: Terms of Reference for Environmental and Social Audit

1.0 Introduction

The Andhra Pradesh Urban Water Supply & Septage Management Improvement Project has been launched by the Government of Andhra Pradesh (GoAP) to improve service standards in water supply to Urban Local Bodies (ULBs). This Project will be implemented by the Andhra Pradesh Urban Finance and Infrastructure Development Corporation, Government of Andhra Pradesh. This project intends to serve 50 ULBs, which have a population of less than 1 lakh except Guntur Nellore, Chittoor ULBs, which presently face both quantity and quality problems. This project is expected to benefit and improve the living standards of about 24.77 lakh population by providing potable water at 135 lpcd. The Project will finance activities including development/ augmentation of water supplies including surface sources and 100% House Service Connections (HSC). The project would consists of components such as Summer Storage Tanks, Intake Wells, Pumping Stations, Pressure/ Gravity Raw Water Transmission Mains, Water treatment plants, Ground Level Balancing Reservoirs, Pressure/ Gravity Treated Water Transmission Mains, Elevated/ Ground Level Service Reservoirs, Distribution Systems, House Service Connections, etc.

2.0 Environmental and Social

The project has been assigned **Category "A"** in accordance with the Asian Infrastructure Investment Bank's (AIIB Bank) Environmental and Social Policy (ESP) and Environmental and Social Standards (ESS). Based on preliminary assessments, all three ESSs, i.e., ESS 1 (Environmental and Social Assessment and Management), ESS 2 (Involuntary Resettlement) and ESS 3 (Indigenous Peoples) are applicable for the project.

As required by the Bank's ESP for Category 'A' projects, an Environmental and Social Management Planning Framework (ESMF) is being developed for the entire project comprising of 50 ULBs.

3.0 Objective

The Objectives of this environmental and social audit are:

- To check the adequacy/correctness of ESD Screening
- To audit the compliance of the environmental and social aspects of projects, which are under implementation and completed;
- To assess the effectiveness of supervision and capacity building initiatives undertaken as part of the ESMPF
- Review and comment on how the recommendations of the internal audit have followed so far.

4.0 Scope of Work

This Environmental and Social audit conducted during Project Implementation or Completion providing systematic environmental and social information about the extent to which project implementation complies with environmental and social conditions

(including an ESMP and even an EMP and RAP/TMP). The audit recommendations will assist project management and supervision.

The various departments involved in the implementation are APUFIDC, PHEMD and sub-project ULB.

5.0 Audit Task

The following are the tasks to be carried out during the audit:

1. **Auditing the compliance of the Sub-Projects**

- Covering the compliance aspects with reference to the agreed ESMPF process at different stages of project as well as the technical content of the EAs/EMPs and RAPs/SMPs. Such an exercise shall include the effectiveness in translating the ESMPs in to contract conditions and technical specifications
- Critically reviewing and reporting the compliance on Bank's recommendations during various supervision missions
- Undertaking field visits to ascertain actual level of compliance in implementing the EMPs and RAPs
- Auditing and confirming that the payment of compensation and assistance has been paid in accordance with ESMPF procedures wherever payment of compensation and assistance is involved for the projects affected people
- Undertaking field visits to interact with the beneficiaries on sample basis to assess their levels of satisfaction with the process followed in delivering the entitlements
- Reviewing the process followed for redressing the grievances filed by the affected people with regard to compensation, R&R assistance or any other related complaints
- Reviewing and confirming that the disclosure of documents has been carried out in accordance with the established procedures
- Commenting on the internal monitoring followed by APUFIDC in managing the social and environmental impacts during the implementation of the sub-projects and propose suitable measures for strengthening the process as needed.
- To check in the field the quality of implementation and effectiveness of the environmental mitigation measures with reference to the performance indicators

Auditing the compliance of environmental and social aspects during construction, operation and maintenance of projects, across all activities and different sub-project locations. The selection of sub-project shall be approved by APUFIDC/ AIIB before the commencement of the Audit. The audit will be carried out in the presence of the representatives of ULBs/ Implementing Agencies.

2. **Adequacy of the ESMP**

Auditing the adequacy of the ESMP and recommend practicable measures to include/improve the management measures and the agency responsible for carrying out the measures, wherever found inadequate. Documenting the best practices and possible environmental and social enhancement measures with respect to the audited projects. Apart from documenting the good practices, shall discuss the deviations in following the EMSPF and corrective measures (project level and in overall process).

6.0 Reporting

a. Reviewing the status report submitted by the ULBs/ Implementing Agencies on the implementation of ESMP and the process adopted by design consultants in identification and mitigation measures while preparing the DPRs. Reporting on the adequacy and timely submission of the Progress Reports including the process involved in addressing the risk management.
b. Reviewing the capacity of APUFIDC to prepare and implement ESMPs for sub-projects and if necessity how it can be enhanced should be proposed.

7.0 Documentation

Documenting the good practices and lessons learnt with respect to Environmental and Social Safeguards implementation and management in the sub-projects.

8.0 Audit Reporting

The findings of the review and audit will be summarized in a tabular form to include compliance, non-compliance, best practices and enhancement measures along with the name of the agency responsible for each of the above. This matrix will be provided as an attachment to the main report. In case of non-compliances, a follow up visit will be undertaken after giving sufficient time (depending on the type of corrective measures) for the agency responsible to take corrective actions.

9.0 Schedule for completion of tasks

The entire tasks shall be completed in a time frame of twelve weeks period.

- The initial report on compliance of shall be completed in 3 weeks time.
- The Draft report on Audit shall be completed in ten Weeks time. This audit will cover say about of 10% works or minimum 5 sub-project.
- The Final Audit Report shall be submitted within twelve weeks.

10.0 Date and Service

The available reports/documents/data will be provided to the consultants.

11.0 Composition of review committee to monitor consultant's work

(1) Project Director – APUWSSMIP
(2) Addl. Director
(3) Director Technical
(4) Project Manager
(5) Capacity Building Officer
(6) Environmental Expert (PMU)
(7) Social Development Expert (PMU)

Annexure 6: Sanitary Inspection Form for Water-Treatment Plant

I. General information Water Treatment Plant	
1. Date of survey	Date / Month / Year
2. Survey of	Source…… Intake…… Treatment plant…… Distribution……
3. Carried out by	Name of person…… Agency……
4. Name of supply	State…… District…… Treatment plant……
5. Address	
6. Person in charge	
7. Year started operation	
8. Area served	…… Population served……
9. Treatment-plant capacity	Designed…… Actual ……
10. Security of plant Fence (Y/N)	…… Security Guard (Y/N) ……
II. Source	
1. Type of water source	Reservoir…… Stream…… River…… Well…… Others……
III. Intake	
1. Is the intake adequate with respect to:	Location? Y/N …… Structure? Y/N…… Maintenance? Y/N…… Pollution sources in the vicinity? Y/N……
IV. Treatment processes employed	
1. Fine screen	
2. Grit chamber	
3. Oil and grease trap	
4. Pre-sedimentation	
5. Pre-disinfection/oxidation	Chlorine gas Bleaching powder Other
6. Activated carbon treatment	
7. Aeration	
8. Coagulation and flocculation	Lime Alum Others
9. Sedimentation	
10. Filtration	
11. Disinfection	
12. Other processes (specify):	
V. Sedimentation	

1. No. of sedimentation tank		
2. Frequency of desludging		
3. Type of desludging facility		
4. Method of sludge disposal		
5. General appearance of clarified water		
6. Turbidity (NTU) at……	(inlet) at ……(outlet)	
VI. Filtration		
1. No. of filters		
2. Filtration rate		
3. Filter run		
4. Depth of gravel		
5. Depth of sand		
VII. Backwashing		
1. Criteria used for initiating backwashing:	Air scour:	……..Rate ……..Duration
	Water scour:	……..Rate ……..Duration
2. Distribution of air and water supply in the sand bed:	Even Uneven	
3. Capacity of clean water for backwash		
4. Any mud balls or cracks in the filter bed?	Before backwash..... After backwash.....	
5. Where does the wash water go?		
VIII. Chlorination		
1. Any interruption in chlorination?		
2. Frequency of interruption:		
3. Cause of interruption:		
4. Type of chemical used:		
5. Dosage of chemical		
6. Safety equipment and measures		
7. Reserve stock of disinfectant……	Quantity:	
8. Storage conditions		
IX. Clear-water tank(s)		
1. No. of tanks		
2. Capacity of each tank		
3. Concentration of free residual chlorine		
4. pH:		
5. Chemical used for pH adjustment and its dosage		
6. Any leak in the tank?		
7. Is the tank properly covered and locked?		
8. Any scum or foreign substances in the tank?		
9. Are air vents and overflow pipes protected by screens?		
X. Process control		

1. Jar test	Yes/ No/ Frequently
2. Ph	Yes/ No/ Frequently
3. Concentration of free residual chlorine	Yes/ No/ Frequently
4. Free residual chlorine	Yes/ No/ Frequently
5. Colour	Yes/ No/ Frequently
6. Turbidity	Yes/ No/ Frequently
7. E.coli/thermos-tolerant coli	
8. Fluoride	
9. Others	
XI. Record keeping	
1. Chemical consumption	
2. Process-control tests	
3. Bacteriological examination	
4. Residual chlorine	
5. Others	
XII. Maintenance	
1. Screen	Cleaning…… Calibrating/oiling/greasing……..
2. Pumping facility	
3. Chlorine-dosing facility	
4. Alum-dosing facility	
5. Fluoride-dosing facility	
6. Instrument (gauge, recording devices, etc.):	
7. General housekeeping	
8. Storage of chemicals	Adequate…….. Inadequate……
XIII. Personnel	
1. No. of present staff	Permanent…….. Casual…….
2. Academic level of the plant superintendent or the most senior operator of the treatment plant	
3. Length of service in present water-treatment plant	
4. Total experience in water treatment	
XIV. Complaints received	
1. From operators:	**….**
2. From management:	**….**

XV. Problems (if any) with:		
1. Fine screen:	(Y/N)	Description of Problems (if any)
2. Grit chamber	(Y/N)	
3. Oil and grease trap:	(Y/N)	
4. Pre-sedimentation:	(Y/N)	
5. Activated carbon	(Y/N)	
6. Aeration:	(Y/N)	
7. Coagulation and flocculation:	(Y/N)	

8. Sedimentation:	(Y/N)	
9. Filtration:	(Y/N)	
10. Fluoridation:	(Y/N)	
11. Disinfection:	(Y/N)	
12. Other process:	(Y/N)	
13. Process control:	(Y/N)	
14. Record keeping:	(Y/N)	
15. Maintenance:	(Y/N)	
XVI. Flow diagram of water works (insert diagram)		
XVII. Remedial measures recommended		
1. Measures to be taken immediately	…. ….	
2. Measures to be taken later on	…. ….	
3. Have problems identified in the previous sanitary survey been corrected? …. ….		
Signature of Inspector……..		

Annexure 7: Sanitary Inspection Form for Piped Water Distribution

I. Type of facility PIPED DISTRIBUTION	
1. General information:	Name of the ULB.....
2. Code no. …… Address.....	
3. Water authority/community representative signature.....	
4. Date of visit.....	
5. Water sample taken?.....	Sample no..... Thermotolerant coliform grade.....

II. Specific diagnostic information for assessment	**Risk**
1. Is there any point of leakage between source and reservoir?	(Y/N)
2. If there are any pressure break boxes, are their covers unsanitary?	(Y/N)
3. If there is a reservoir:	(Y/N)
4. Is the inspection cover unsanitary?	(Y/N)
5. Are any air vents unsanitary?	(Y/N)
6. Is the reservoir cracked or leaking?	(Y/N)
7. Are there any leaks in the distribution system?	(Y/N)
8. Is the area around the tap stand unfenced (dry stone wall and/or fencing incomplete)?	(Y/N)
9. Does water accumulate near the tap stand (requires improved drainage canal)?	(Y/N)
10. Are there human excreta within 10m of the tap stand?	(Y/N)
11. Is the plinth cracked or eroded?	(Y/N)
12. Does the tap leak?	(Y/N)
Total risk score	
Contamination risk score: 10–11 5 very high; 6–9 5 high; 3–5 5 intermediate; 0–2 5 low	
III. Results and recommendations	
The following important points of risk were noted: ..... (List nos. 1–11) and the authority advised on remedial action.	
Signature of Sanitary Inspector.....	

Annexure 8: Environmental Management Plan for contractors

Environmental Management Plan: Pre- Construction Phase
Comprehensive Planning of Water Supply Service Improvements (Package-I)

S.No.	Activity	Mitigation Measures	Responsible agencies
1	Clearances	Environmental clearances and permits required during construction shall be ensured and made available before start of work.	ULB / Concerned Departments & Contractor
2	Tree Cutting	i) Minimize cutting of trees by adjusting the layout of all facilities or the alignment of intake structures, treatment plants, transmission mains, pumping stations, reservoirs, etc. ii) Tree guards to be provided for protection to the trees to be retained (e.g. Masonry tree guards, Low level RCC tree guards, Circular Iron Tree Guard with Bars) as required. ii) Enumerate the number of trees that will be affected with girth size & species type along the transmission mains, pumping station sites and water treatment plant site. The details to be indicated on map to scale and/or a strip map as may be appropriate. Tree cutting schedule to be prepared to obtain approvals for tree cutting. iii) Trees identified for cutting shall be removed from the construction sites before commencement of construction after obtaining necessary approval. iv) Undertake tree plantation (not less than two rows inside and along the boundary of WTP, and compensatory plantation as per the tree cutting clearances). Ideal species should be selected in consultation with the Municipality/ Forest Department v) Compensatory plantation by way of Re-plantation of at least five times of the number of trees cut/removed should be carried out in the project area.	Contractor / ULB
3	Utility Relocation	i) Identify the common utilities to be affected such as: telephone cables, electric cables, electric poles, water pipelines, public water taps, bridges, flyovers, etc ii) Affected utilities shall be relocated with prior approval of the concerned agencies before construction starts. iii) Provide advance notice (not less than 10 working days) to affected parties. The advance notice shall be in the form of written notice and a Grievance Redress Cell shall be established prior to any field level activity for timely addressing of grievances	Contractor / ULB/ Concerned departments
4	Baseline Monitoring	Standard procedures shall be adopted during monitoring, and analysis of the environmental attributes such as Air, Water and Noise pollution. Parameters given in the ESMF needs to be monitored (during pre-construction construction by contractor and during post-construction by the municipality).	Contractor / ULB
5	Planning of temporary	i) Temporary diversion will be provided with the approval of the Engineer-in-Charge. Detailed traffic control plans shall be	Contractor / ULB

S.No.	Activity	Mitigation Measures	Responsible agencies
	Traffic arrangements	prepared and submitted to the engineers for approval, at least two weeks prior to commencement of works. ii) The traffic control plans shall contain details of temporary diversion, details of arrangements for construction under traffic, details of traffic arrangement after cessation of work each day, SIGNAGES, safety measures for transport of hazardous materials and arrangement of flagmen. Care should be taken to ensure that disabled persons/ persons with medical needs are not denied access or disadvantaged due to construction activities iii) Any accidents and/or inconveniences caused to the community shall be borne by the contractor	
6	Storage of materials	The contractor shall identify the suitable site for storage of construction materials, etc. These sites shall be operated only after prior approval of the Engineer-in-Charge. Care should be taken to ensure that neighboring communities are not impacted due to the operations of the Storage facility	Contractor / ULB
7	Construction of labour camps	i) Contractor shall follow all relevant provisions of the Building and the other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 for construction and maintenance of labour camp (should be gender sensitive and child friendly). ii) The location, layout and basic facility provision of each labour camp will be submitted to Engineer-in-Charge prior to their construction. iii) The construction will commence only upon the written approval of the Engineer. The contractor shall maintain necessary living accommodation and ancillary facilities, such as toilets, bathing spaces, dining & cooking spaces in functional and hygienic manner and as approved by the Engineer-in-Charge. iv) All temporary accommodation must be constructed and maintained in such a fashion that uncontaminated water is available for drinking, cooking and washing. An appropriate sewage system for the camp should be established. Adequate health care is to be provided for the work force. The layout of the construction camp and details of the facilities provided should be prepared and shall be approved by the Engineer-in-Charge. The construction camp shall not be located within 1000m from the nearest water stream, residential areas and/or any sensitive land uses like schools, hospitals etc. Provisions for safety measures, PPE, safety tool box talks, safety supervision should be in place before commencement of construction activities	Contractor

Note: Please note that the alignment of the pipeline should be free from all encumbrances (encroachments, squatters) before handing over to the Contractor. The SIA should address the issues of any possible encroachment in the land where construction activities will take place and proper actions should be taken to ensure that physically or economically displaced persons shall be appropriately compensated.

Environmental Management Plan- Construction Phase

S.No.	Activity	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Reference Document/
1	Sourcing of Materials	Extraction of rocks and material may cause ground instability	Verify suitability of all material sources and obtain approval of Engineer in Charge; Use the approved quarries by the competent authorities. These may include: Metal, Bricks. MS & DI pipes, HYSD steel, pumping machinery shall be obtained from the manufacturers.	Construction Contractor (CC)	Contract document
2	Stock piling	(i)Fugitive dust emissions (ii) Run-off from stockpiled materials during construction works can contaminate surface water quality	i)Construction Contractor shall identify designated areas for stockpiling of sand, gravel, and other construction materials; ii) Construction material shall be covered or stored in such a manner so as to avoid being affected by wind direction. iii) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets; iv) Use of sprinklers for dust suppression	Construction Contractor (CC)	The Environment (Protection) Act, 1986 The Air (Prevention and Control of Pollution) Act 1981 CPCB standards of ambient air quality and vehicular and equipment emission
3	Haulage / transportation	Emissions from vehicles, construction equipment, and machinery used for excavation and disposal resulting in fugitive dusts and increase in concentration of vehicle-related pollutants.	i) All vehicles including construction equipment should have valid PUC. ii) Unpaved roads near / passing through residential and commercial areas (in project area) to be watered twice in a day. ii) Trucks carrying construction material to be adequately covered to avoid dust pollution and spillage of construction materials.	Construction Contractor (CC)	
4	Excavation	Fugitive Dust Pollution near settlements	i) All earth work will be protected in a manner acceptable to the engineer to minimize fugitive dust. ii) Sprinkling of water on construction sites using water tanker during dry weather	Construction Contractor (CC)	The Environment (Protection) Act, 1986 The Air (Prevention and Control of Pollution) Act 1981
5	Shifting of common utilities	Disruption of services	i) Ensure community consensus and minimum impact to common utilities like telephone cable, electric cables, electric poles, water taps and etc.,	Construction Contractor (CC)	Contract document

S.No.	Activity	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Reference Document/
			ii) Provide advance notice (not less than 10 working days) to affected parties. ii) Affected utilities shall be relocated with prior approval of the concerned agencies before construction starts.		
6.	Dewatering during intake well construction	Improper disposal can contaminate nearby water bodies.	While construction of the Intake well, a temporary coffer dam will be constructed to divert water to mitigate surface water pollution. Before start of Intake well construction dewater the coffer dam area to minimize surface water pollution.	Construction Contractor (CC)	The Water (Prevention and Control of Pollution) Act 1974
7.	Pollution from Fuel and Lubricants	Leakage of Fuel and lubricants used in the machinery is the main source of water and soil pollution.	i) The contractor shall ensure that all construction vehicles parking location, fuel/lubricants storage sites, vehicle, machinery and equipment maintenance and refueling sites shall be located away from rivers and irrigation canal/ponds. ii) Contractor shall ensure that spillage of fuels and lubricants does not contaminate the ground. iii) Contractor shall arrange for collection, storing and disposal of oily wastes to the pre-identified disposal sites as approved by the Engineer. All spills and collected petroleum products will be disposed off in accordance with MoEF and state PCB guidelines. iv) Engineer will certify that all arrangements comply with the guidelines of PCB/ MoEF or any other relevant laws.	Construction Contractor (CC)	The Environment (Protection) Act, 1986. The Water (Prevention and Control of Pollution) Act 1974
8.	Noise Levels (Vehicles, Plant & Equipment)	Vehicular noise pollution at residential / sensitive receptors.	i) Plan activities in consultation with ULB which will result in least disturbance; ii) Provide signage for no honking iii) Maintain instantaneous maximum sound levels not exceeding 80 decibels (dbA) when measured at a distance of 10 m or more from the vehicle/s and conduct noise level monitoring at sensitive receptors. All vehicles should be PUC compliant.	Construction Contractor	Noise Pollution (Regulation and Control) Rules, 2000
9.	Tree cutting	Tree felling identified at project locations..	i) Provide adequate protection to the trees with tree guards ii) Enumerate number of trees that will be felled iii) Compensatory plantation of at least five times the number of trees felled should be done.	Construction Contractor	Forest (Conservation) Act, 1980, amended 1988 Andhra Pradesh Water, Land and Tree Act,

S.No.	Activity	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Reference Document/
					2002 Wildlife Protection Act
10	Aquatic fauna	(i) Impact on aquatic fauna affect water quality- temporary turbidity during construction (ii) Impact on reservoir bed sediment- removal of part of sediment within intake structure- local disturbance for aquatic life	i) Not to dispose any construction materials in water bodies which may pollute the water and aquatic fauna; (ii) Before commencing piling, carry-out 'soft-start' for pile driving, slowly increasing intensity of the driving hammer power; and (iii) Promptly remove sediment and bonding materials to control turbidity at Intake well in the sources.	Construction Contractor	Forest (Conservation) Act, 1980, amended 1988 Andhra Pradesh Water, Land and Tree Act, 2002 Wildlife Protection Act
11	Disposal of Debris / spoil	Solid wastes as well as excess construction materials contaminating the ecosystem and impacting aesthetic profile of the land .	Manage solid waste according to the *following* preference hierarchy: reuse, recycling and disposal to designated areas as per ULB; Avoid stockpiling of excess excavated soils; Coordinate with Municipal Corporation for beneficial uses of excess excavated soils or immediately dispose to designated areas; The contractor shall not dispose excavated material near the cross drainage works viz., culverts, drains, streams so as not affect the natural regime of the water flow. Excess earth quantity is proposed to be carted out and disposed at the designated areas	Construction Contractor	The Municipal Solid Wastes (Management and Handling) Rules, 2000
12	Diversion of traffic during construction	Traffic problems in right-of-way (ROW) during pipe laying.	i) Before taking up of construction activity, a Traffic Control Plan shall be devised and implemented to the satisfaction of the Engineer. ii) Construction shall be taken up in a phased manner so that free sections are available for traffic. iii) Temporary diversion will be provided with the approval of the engineer. iv)The traffic control plans shall be prepared and approved by engineer one week prior to commencement of works.	Construction Contractor	Contract document Appropriate Construction Techniques

S.No.	Activity	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Reference Document/
			vi) The arrangement for the temporary diversion of the road shall ensure to minimize the environmental impacts, like loss of vegetation, productive lands etc., vii) Special consideration will be given to the preparation of the traffic control plan for safety of pedestrians and workers at night. viii) The contractor shall ensure that the diversion / detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow. He shall inform local community of changes to traffic routes, conditions and pedestrians access arrangements. ix) This plan will be periodically reviewed with respect to site conditions. x) The temporary traffic detour will be kept free of dust by frequent sprinkling. xi) The construction site should be barricaded at all times in a day with adequate marking, flags, reflectors etc. for safety of general traffic movement and pedestrians.		
13	Stacking of pipes	Improper stacking of pipes leads to traffic problems and accessibility to properties.	The pipes shall be stacked at appropriate place designated by the engineer in charge.	Construction Contractor	Contract document
14	Socio-economic disruptions/ Temporary loss of income	Impede the access of residents and customers to nearby shops during laying of pipe lines. Temporary displacement of persons or commercial activities. (Permanent displacement will be addressed by the Department)	(i) Leave spaces for access between mounds of soil; (ii) Provide walkways and metal sheets where required to maintain access across trenches for people and vehicles; (iii) Increase workforce in front of critical areas such as institutions, places of worship, business establishments, hospitals, and schools; (iv) Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/ complaints. Physically or economically displaced persons will be compensated as per the RPF	Construction Contractor	Contract document Social impact assessment and compensation matrix

S.No.	Activity	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Reference Document/
15	Occupational Health and Safety	Occupational hazards which can arise from working in Project sites	(i) Implement Health and Safety measures including: (a) restrict public movement in the zone of works; (b) ensuring all workers are provided with and use of Personal Protective Equipment like helmet, gloves and gumboots at concreting locations, nose mask at dust producing areas, safety belt during work at height; (c) H and S Training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents; (ii) First Aid box shall be easily accessible throughout the site; (iii) Provide medical insurance coverage for workers; (iv) Provide supplies of potable drinking water; (v) Provide clean eating areas where workers are not exposed to hazardous or noxious substances; (vi) Maintain work areas to minimize slipping and tripping hazards; (vii)For night work, provision of proper illumination for the work space, while controlling glare so as not to blind workers and passing motorists; (viii) Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas; (ix) Ensure moving equipment is outfitted with audible back-up alarms; and (x) Disallow worker exposure to noise level greater than 80 dBA for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively. (xi) The contractor will make sure that during the construction work all relevant provisions of the Construction Workers (regulation of Employment and Conditions of Services) Act, 1996 are adhered to.	Construction Contractor	Environmental, Health, and Safety (EHS) Guidelines- Water and sanitation (2007) prepared by World Bank Group
17	Chance Found Archaeological Property	Risk of archaeological chance finds	i) All fossils, coins, articles of value of antiquity, structures and other remains or things of geological or archaeological interest discovered on the site shall be the property of the Government and shall be dealt with as per provisions of the relevant legislation.	Construction Contractor	The Ancient Monuments and Archaeological Sites and Remains Act 1958

S.No.	Activity	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Reference Document/
			ii) The contractor will take reasonable precautions to prevent his workmen or any other persons from removing and damaging any such article or thing. iii) He will, immediately upon discovery thereof and before removal acquaint the Engineer of such discovery and carry out the SC's instructions for dealing with the same, waiting which all work shall be stopped. iv) The Engineer will seek direction from the Archaeological Survey of India (ASI) before instructing the Contractor to recommence the work in the site.		
18	Clearing of construction camps and restoration	Affect Land Aesthetics	i) Contractor to prepare site restoration plans, the plan is to be implemented by the contractor prior to demobilization. ii) On completion of the works, all temporary structures will be cleared away, all rubbish cleared, excreta or other disposal pits or trenches filled in and effectively sealed off and the site left clean and tidy, at the contractor's expenses, to the entire satisfaction of the engineer.	Construction Contractor	Contract document

Annexure 9: Public Consultation Meeting

Samaj Vikas Development Support Organisation has prepared Environmental and Social Management Planning Framework, Tribal Population Planning Framework and Resettlement Policy Framework for Andhra Pradesh Urban Water Supply and Sepatge Management Improvement Project (APUWSSMIP). It is the policy of the project to disseminate the study findings to the stakeholders. A Public consultation meeting was held on 12th September 2018 at Conference Hall, CDMA, Gorantla village, Guntur
The participants from various ULBs have attended this meeting including women groups, NGOs, Department Engineers, general public and AIIB representative. The workshop started with brief introduction of the project, the objective of the meeting by Deputy Project Director and later study findings were presented. Some of the key points presented are:

- APUWSSMIP will be implemented in 50 ULBs in the AP with the population less than 1,00,000.
- The project envisages provision of 135 lpcd potable water to 2.4 million population in 50 ULBs of the state.
- Water is proved from surface. The main project components are laying of raw water main, construction of storage and service reservoirs, laying and extending service network, providing house service connections and retrofitting the existing infrastructure with assistance from Asian Infrastructure Investment Bank (AIIB).
- Planning will be done in consultation with community participation.
- For every sub-project screening will be done during planning to categorize and assess the impacts and risks.
- ESMPF is prepared to enhance positive impacts and mitigate or minimize the negative impacts and risks through the project life cycle.
- A EMP, SMP, RFP and TPPF is developed for effective social and environment management of project.
- A project specific redress grievances mechanism and monitoring is proposed to ensure maximum benefits to the beneficiaries.

<u>The following are Views and Suggestions expressed by the participants</u>

S No	Questions asked/ feedback/ suggestion by Participants	Answers/ clarifications given
1.	In urban and semi-urban areas RO water is used for drinking. The RO plants uses ground water. Is there any regulation to check the uses of ground water for RO plants?	There is no such regulation.
2.	What will be the water charges proposed under this project for house service connection?	The water charges will be fixed in consultation with community with prevailing Government

		policy and orders and which help in recovering O&M cost.
3.	Do you have sufficient water from source to provide for all the purpose including institutional and commercial uses?	The project is to provide 135 lpcd from surface source.
4.	Presently in town the distribution network is covered entire town especially new merged areas/villages. Under this project will this extension areas will be covered?	The project will provide to all the houses under jurisdiction of ULB including extension areas.
5.	Due to uneven distribution network people uses motor and pit tapping which leads to low pressure at the tail end. How this will be solved.	The project is designed to provide 135 lpcd. Appropriate technology like zoning will be used so that even tail end house receive water with same pressure.
6.	There is lot of migration from rural areas to these town. Will the project can accommodate the migration population and new settlers.	The project is designed conducting a trend analysis and for 30 year population project.
7.	The town have narrow lanes and during construction people face traffic congestions and difficulties especially in market areas. What are the measures taken?	A Management Plan is prepared to mitigate these impacts during construction phase. Prior information will be given to local community of changes to traffic routes, conditions and pedestrian access arrangements
8.	What is the mechanism for water related complaints under this project?	A separate grievance mechanism is proposed to solve the problems during the project implementation
9.	Who will maintain this water supply system?	The water supply system maintenance will be handled by ULBs.
10.	One of the women participant expressed that they are aware of water borne diseases. If good water is provided only they said they can pay.	The purpose of the project is to provide safe drinking water and adequate supply to community.
11.	Also they expressed that water contamination is due to waste water getting into the good water supply.	As part of this project in 5 ULBs waste water and sewerage treatment plants are taken on

		pilot basis. Later it will be implemented in other ULBs
12.	The consultation for each aspect should be done for one full day. The first half day should be presentation and second half day should be discussion.	The documents are available on website including executive summary both in English and Telugu. A paper advertisement is give with the details about the availability of documents in website. People can refer the documents and can share their comments.

The session was concluded by AIIB representative giving a brief about the assignment as every development project will have both positive and negative impacts and under this project the main focus will be no one should be affected and impacts to be minimized. The policies and procedures set in the project are Government of India and Government of Andhra Pradesh acts and rules which are being followed. For this purpose the ESMPF is prepared and consultation is conducted to disseminate and to gather public opinion and suggestions.

The Second session was presenting the Resettlement Policy Framework (RPF) development for the project. The key points presented are:

Resettlement of Project Affected Persons (PAPs) will be planned and implemented as an integral part of APUWSSMIP where acquisition of private land and its transfer is unavoidable. The impacts covered are;

i. loss of agricultural land/ homestead;
ii. loss of assets or access to social, economic and cultural assets and
iii. loss of income sources of means of livelihood, whether or not the affected persons must move to another location.

The procedures to be used in case of any such land requirement are detailed in the Resettlement Policy Framework (RPF). The Entitlement Matrix of the project reflects the project plan to address adverse impacts and mitigation based on the eligibility criteria.

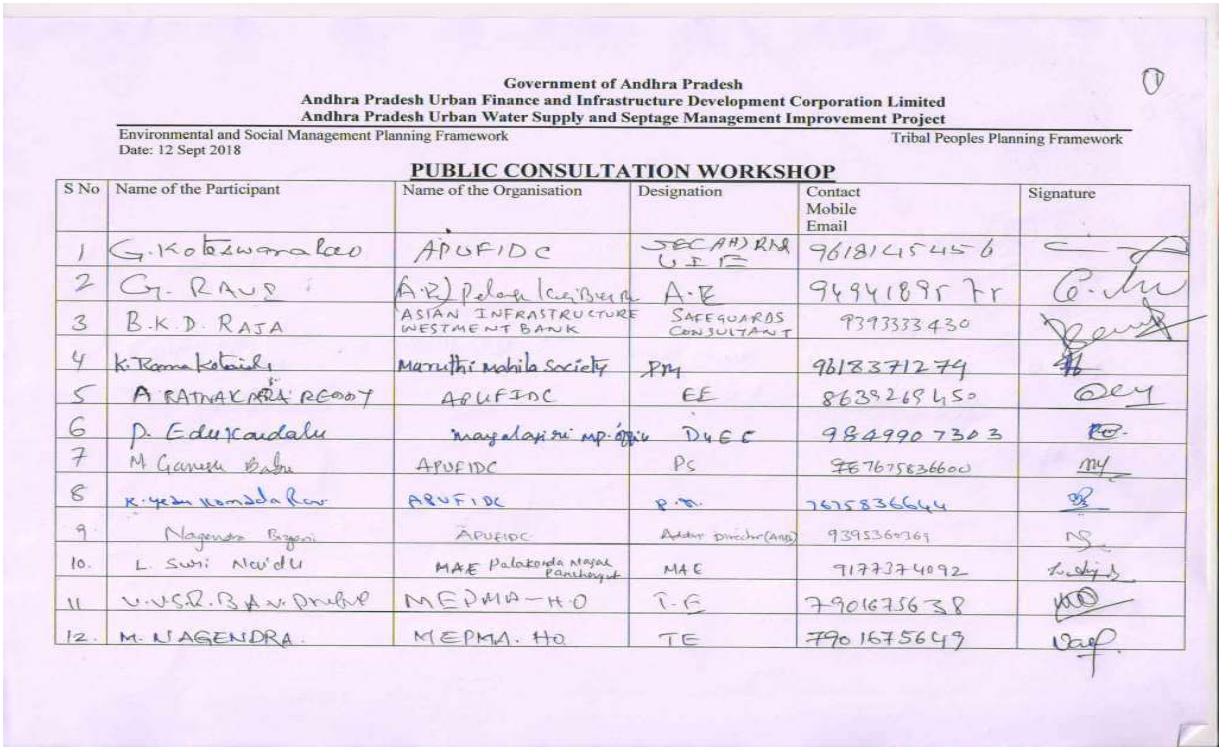
S No	Questions asked/ feedback/ suggestion by Participants	Answers/ clarifications given
1.	The participants expressed that for commercial squatter/vendors rather than giving monetary benefits the project/government can provide alternate place for business.	All the assistance will be given as per policy that is prepared in accordance with Government of India Act and Government of Andhra Pradesh Policy

2.	If a person staying/using government land gets affected, is he eligible for compensation and assistance?	The affected person is eligible for compensation and assistance as per policy
3.	Will the people whose business get affected during the construction will receive assistance?	It will be provided as per the R&R entitlement.

Finally, to the participants it was suggested and informed that people will be involved and should participate in project planning, implementation and maintenance as this will bring benefits particularly related to health. Participation during project life cycle will make project more durable. During the execution, there might be temporary impacts like pollution, disruptions and poor accessibility. As part of the project, these issues will be addressed and taken proper care and will be mitigated.

The meeting was concluded by Social Expert, APUFIDC and expressed gratitude to participants for sharing their views and suggestions.

Annexure 10:List of Participants



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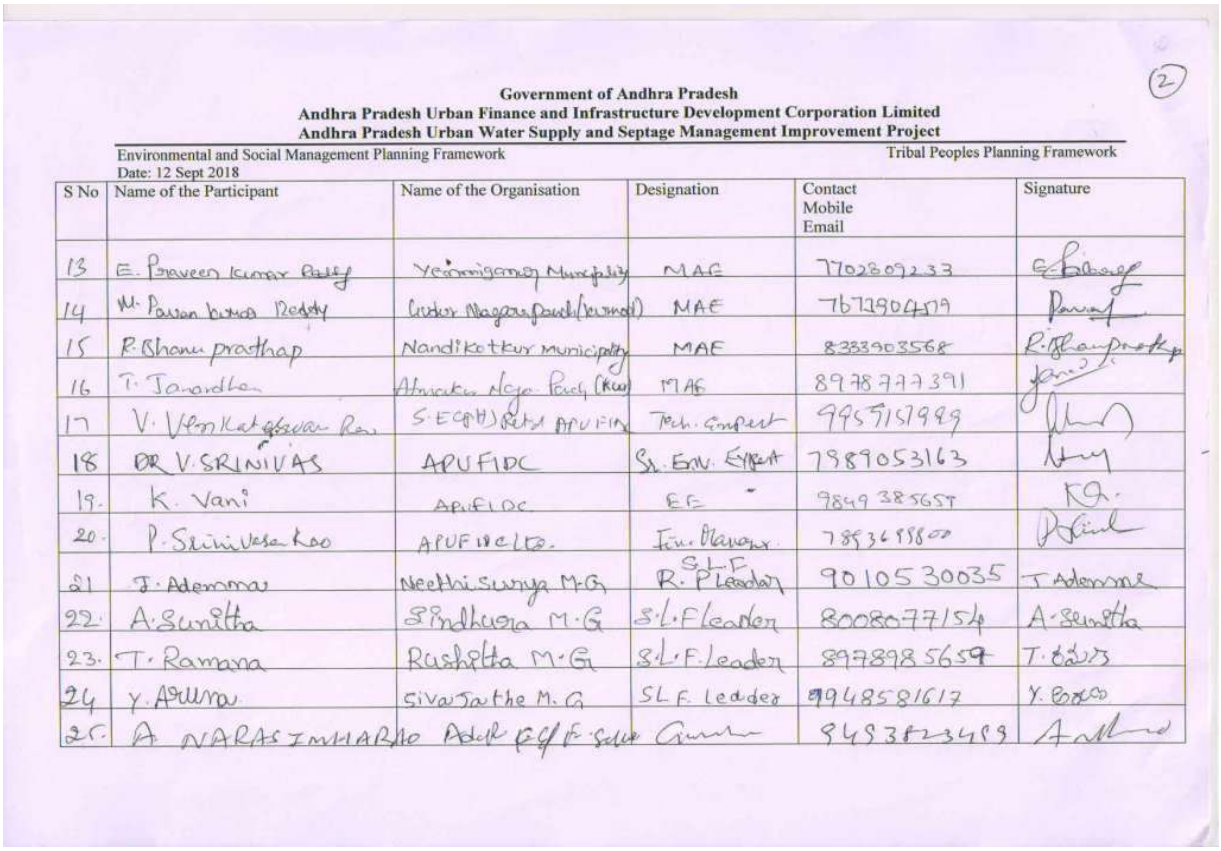
Andhra Pradesh Urban Finance and Infrastructure Development Corporation Limited
Andhra Pradesh Urban Water Supply and Septage Management Improvement Project

Environmental and Social Management Planning Framework — Tribal Peoples Planning Framework
Date: 12 Sept 2018

PUBLIC CONSULTATION WORKSHOP

S No	Name of the Participant	Name of the Organisation	Designation	Contact Mobile Email	Signature
1	G. Koteswara Rao	APUFIDC	SECAH) RM UIP	9618145456	
2	G. RAJU	(A.P) Polavaram Project Authority	A.E	9494189577	
3	B.K.D. RAJA	ASIAN INFRASTRUCTURE WESTMENT BANK	SAFEGUARDS CONSULTANT	9393333430	
4	K. Ramakotaiah	Maruthi mahila Society	PM	9618371274	
5	A RATNAKARA REDDY	APUFIDC	EE	8639269450	
6	P. Eduvandalu	mangalagiri mp. office	DEE	9849907303	
7	M Ganesh Babu	APUFIDC	PS	7675836600	
8	K. Venkata Ramana Rao	APUFIDC	P.A.	7675836644	
9	Nageswara Rao	APUFIDC	Addnl Director (Angl)	9395360769	
10.	L Suri Naidu	MAE Palakonda Nagar Panchayat	MAE	9177374092	
11	V.V.S.R.S.N. Prabhu	MEPMA-HO	T.E	7901675638	
12.	M. NAGENDRA	MEPMA. HO	TE	7901675649	



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S No	Name of the Participant	Name of the Organisation	Designation	Contact Mobile Email	Signature
13	E. Praveen Kumar Reddy	Yerramsetty Municipality	MAE	7702809233	
14	M. Pawan Kumar Reddy	Gudur Nagarpanchayat (Kurnool)	MAE	7673904579	
15	P. Bhanu prathap	Nandikotkur Municipality	MAE	8333903568	
16	T. Jayadhar	Atmakur Nagar Panchayat (Kurnool)	MAE	8978777391	
17	V. Venkateswara Rao	S.E(HQ) APUFIDC	Tech. Expert	9959157999	
18	DR V.SRINIVAS	APUFIDC	Sr. Env. Expert	7989053163	
19.	K. Vani	APUFIDC	EE	9849385657	
20.	P. Srinivasa Rao	APUFIDC Ltd.	Fin. Manager	7893698800	
21	J. Adeemma	Neethi Surya M.G	R. SLF Leader	9010530035	
22.	A. Sunitha	Sindhuja M.G	S.L.F leader	8008077154	
23.	T. Ramana	Rushitha M.G	S.L.F. leader	8978985659	
24	Y. Aruna	Sivajothe M.G	SLF leader	9948581617	
25.	A NARASIMHARAO	Addl CE/F.Secy	Guntur	9493823499	

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S No	Name of the Participant	Name of the Organisation	Designation	Contact Mobile Email	Signature
26	[illegible]	[illegible] M.G	SHG Leader	9494154115	Vijayalakshmi
27	Alluri Ramatulasi	kanthi Sri M.G	S.H.G leader	9491671909	A.R.Tulasi
28	Peddi Jyothi	Vijayalakshmi M.G	S.H.G Leader	9550400526	P. Jyothi
29	B.R. [illegible]	Engineering	AE	9490781816	[illegible]
30	G.Karthika	Bharatamatha M.G	SHG leader	9951082479	G.Karthika
31	Shakil Ahmed	Inspire Edu. Soc	president	9985071111	[illegible]
32	M. Murali Mohan	HOPE	Secretary	9346566699	[illegible]
33	T. Vijaya Jyothi	APUFIDC	D.E.E	9848970579	[illegible]
34	A. Sri bhagya lakshmi	Ragavendra S.S.	R.K. leader	9182636159	[illegible]
35	[illegible]	MEPMA	"	9966653265	
36	V.Lakshmi Prasanna	MEPMA	"	9603989629	
37	B.Subbulu	MEPMA	"	9666538524	
38	O. Naga Sirisha	MEPMA	"	9676170037	[illegible]

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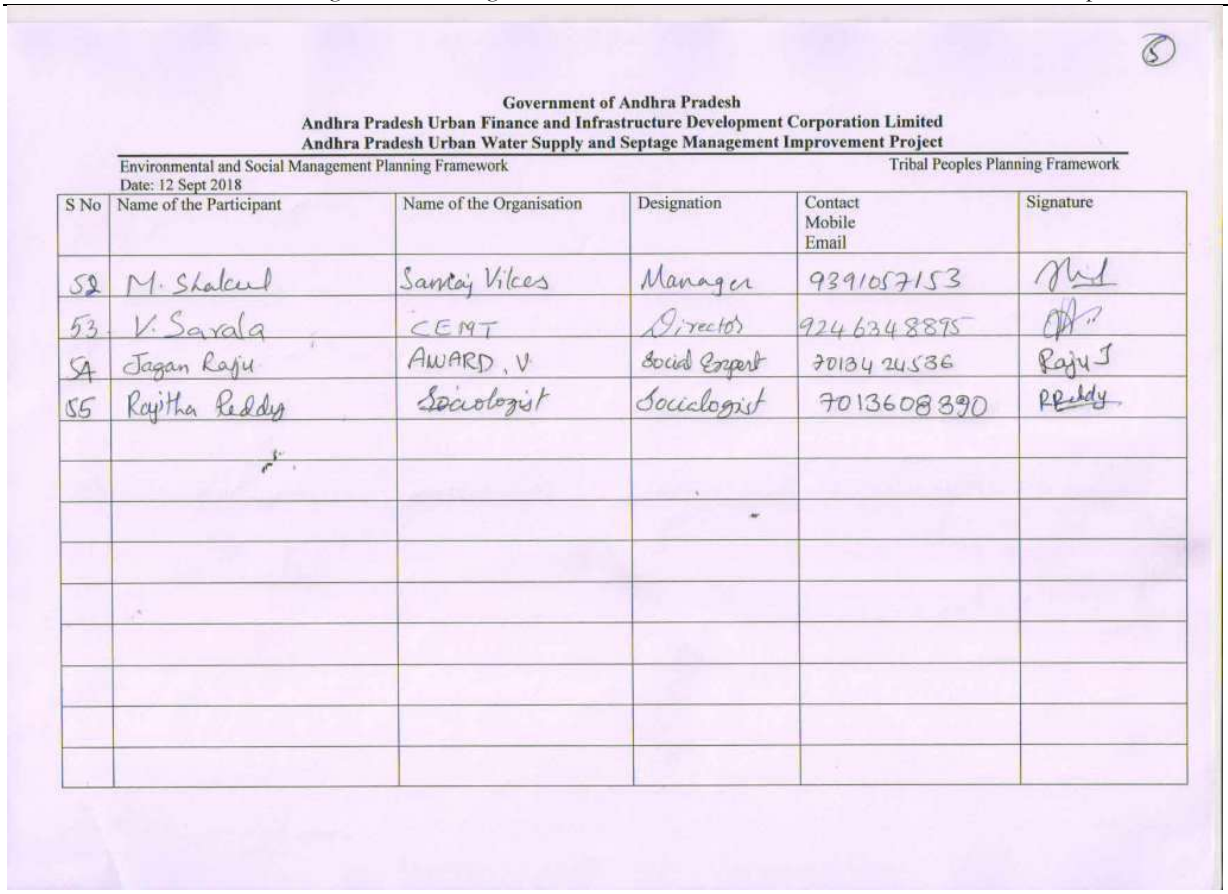
S No	Name of the Participant	Name of the Organisation	Designation	Contact Mobile Email	Signature
39	G.PUJITHA	Mepma	SHG R.P	8977888969	G.Pujitha
40	U. Nagamani	Mepma	SHG Leader	9494546116	[illegible]
41	T. Pallavi	APUFIDC	MIS Assistant		Pallavi
42	M. Mary	[illegible]	[illegible]	9966150413	[illegible]
43	K.S. Murthy	APUFIDC	Social Expert	7382153361	[illegible]
44	Y. HARSHAVARDHAN	eGOVERNMENTS	PROJECT MANAGER	9490960349	Y. [illegible]
45	Ch.Akhil Chowdary	e-governments	Jr. Business Analyst	9948959690	Akhil
46	SK. Khaja Vali	egovernments	Jr. BA	9885867775	[illegible]
47	K [illegible]	NAMBUS		7416674249	[illegible]
48	S. HARSHA	E-Governments	Jr. BA	9700886855	Harsha
49	Hussain	E-Governments.	Jr-BA	9550748420	[illegible]
50	Y. Sundeep	Karvy	DBA	8019235143	[illegible]
51	B. Jawahar Lal	KARVY	Manager	9966650580	[illegible]



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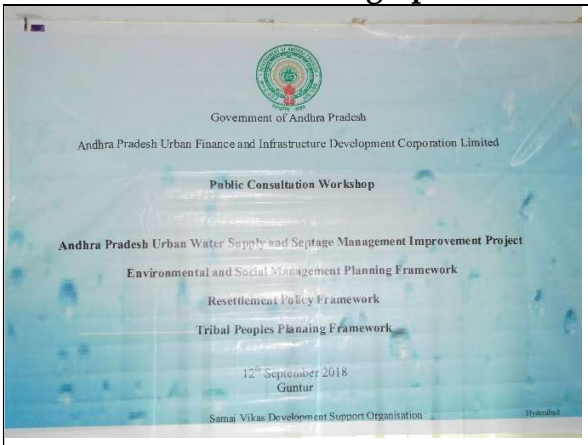
S No	Name of the Participant	Name of the Organisation	Designation	Contact Mobile Email	Signature
52	M. Shakeel	Samaj Vikas	Manager	9391057153	
53	V. Sarala	CEMT	Director	9246348895	
54	Jagan Raju	AWARD, V	Social Expert	70134 24536	Raju J
55	Rajitha Reddy	Sociologist	Sociologist	7013608390	RReddy

Annexure 11: Photographs



Field Photographs

Women Consultation – Slum at Soothikonda, Palasa

Household Survey at Macherla

Women Consultation at Macherla

Tanker Supply at Macharla

Household Survey at Puttaparty

Household Survey at Yeleshwaram