INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROPOSED LOAN

IN THE AMOUNT OF US$300 MILLION

EQUIVALENT TO INDIA

FOR THE

HARYANA CLEAN AIR AND SUSTAINABLE DEVELOPMENT PROGRAM (P510686)

ENVIRONMENT AND SOCIAL SYSTEMS ASSESSMENT
REVISED DRAFT

AUGUST 2025

CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

AMASR	Ancient Monuments and Archaeological Sites and Remains
ARAI	Automotive Research Association of India
ATMA	Agricultural Technology Management Agency
ATS	Automated Testing Station
AQM	Air Quality Management
ARJUN	AI for Resilient Jobs, Urban Air Quality & Next-Gen Skills
ATR	Action Taken Report
BC	Backward Caste
BCC	Behavior Change Communication
BOCW	Building and Other Construction Workers
BPL	Below Poverty Line
C&D	Construction and Demolition
CAAQMS	Continuous Ambient Air Quality Monitoring Station
CAQM	Commission for Air Quality Management
CBG	Compressed Biogas
CEMS	Continuous Emission Monitoring System
CHS	Community Health and Safety
CPCB	Central Pollution Control Board
DG	Diesel Generator
DLI	Disbursement-Linked Indicator
DoA	Department of Agriculture
DoEFCC	Department of Environment, Forest, and Climate Change
DoF	Department of Finance
DoI	Department of Industries
DoRD	Department of Rural Development
DoT	Department of Transport
DoUD	Department of Urban Development
DSS	Decision Support System
E&S	Environmental and Social
EEP	Environmental Education Programme
EHS	Environment, Health, and Safety
EIA	Environmental Impact Assessment
EIACP	Environmental Information, Awareness, Capacity Building and Livelihood Programme
ELV	End-of-Life Vehicle
ESCP	Environmental and Social Commitment Plan
ESDP	Entrepreneurship Skill Development Programme
ESF	Environmental and Social Framework
ESHS	Environmental, Social, Health and Safety
ESMP	Environmental and Social Management Plan
ESSA	Environmental and Social Systems Assessment
ETP	Effluent Treatment Plant

EV	Electric Vehicle
GoH	Government of Haryana
GoI	Government of India
GRM	Grievance Redress Mechanism
HCAP	Haryana State Action Plan for Clean Air
HKRNL	Haryana Kaushal Rozgar Nigam Limited
HSPCB	Haryana State Pollution Control Board
ICC	Internal Complaints Committee
IA	Implementing Agency
IEC	Information, Education, and Communication
IGP	Indo-Gangetic Plain
IPF	Investment Project Financing
IVA	Independent Verification Agency
LMP	Labour Management Procedures
LPG	Liquified Petroleum Gas
M&E	Monitoring and Evaluation
MoEFCC	Ministry of Environment, Forest, and Climate Change
MSMEs	Micro, Small, and Medium Enterprises
NAAQS	National Ambient Air Quality Standards
NBCI	National Biomass Cookstoves Initiative
NBMMP	National Biogas and Manure Management Programme
NCAP	National Clean Air Program
NCR	National Capital Region
NEERI	National Environmental Engineering Research Institute
NKN	National Knowledge Network
NMSA	National Mission for Sustainable Agriculture
NPMCR	National Policy for Management of Crop Residues
NPOF	National Project on Organic Farming
OHS	Occupational Health and Safety
PAP	Program Action Plan
PCB	Pollution Control Board
PDO	Program Development Objective
PforR	Program-for-Results
PKVY	Paramparagat Krishi Vikas Yojana
PM	Particulate Matter
PMKSY	Pradhan Mantri Krishi Sinchai Yojana
PMU	Program Management Unit
PMUY	Pradhan Mantri Ujjwala Yojana
POM	Project Operations Manual
POSH	Prevention of Sexual Harassment
PPE	Personal Protective Equipment
PwDs	Persons with Disabilities
RA	Results Area
rDF	Refuse Derived Fuel
RISE	Resilient and Inclusive Supply Chain Enhancement

RKVY	Rashtriya Krishi Vikas Yojana
RVSF	Registered Vehicle Scrapping Facility
SATAT	Sustainable Alternative Towards Affordable Transportation
SC	Scheduled Caste
SEA/SH	Sexual Exploitation and Abuse/Sexual Harassment
SEP	Stakeholder Engagement Plan
SGMT	Social Media Grievance Tracker
SHG	Self-Help Group
SOP	Standard Operating Procedures
SPM	Secondary Particulate Matter
SPV	Special Purpose Vehicle
ST	Scheduled Tribe
STP	Sewage Treatment Plant
TERI	The Energy and Resources Institute
ULB	Urban Local Body
V-VMP	Voluntary Vehicle Fleet Modernization Program

EXECUTIVE SUMMARY

E.1 Background

Haryana grapples with air pollution stemming from its industrial and urban development, coupled with agricultural practices, and transboundary pollution from neighboring states. Transport, household cooking, and agriculture are the largest contributors to high levels of ambient $PM_{2.5}$ in Haryana. Together, these sources contribute to over 60 percent of $PM_{2.5}$ concentrations. Significant efforts to reduce emissions are already under way through introduction of policies on electric vehicles (EVs), and centers have been established for scrapping of older vehicles. The state has introduced a set of measures and incentives on reusing crop residue for bioethanol and co-firing the residue in power plants.

The state has formulated its first Haryana State Action Plan for Control of Air Pollution (HCAP) in 2023. The plan responds to the growing pressure for states to take the lead on air quality management (AQM) through a broader airshed approach. The World Bank-financed Program-for-Results (P) will support a subset of actions in this plan, hence referred to as the government program (p). Within each of these measures, there is a specific set of stakeholders in the state that must be engaged, not only in investments but also in a process of behavior change and institutional reform to sustain efforts into the future.

Addressing all air pollution sources will require time and long-term cooperation among many different stakeholders, given the nature of the investments, financing strategies, and implementation modalities. Following global experience, the Government has opted to use a multisectoral approach, to implement a set of prioritized investments in transport, agriculture, industries, and dust control within the **Haryana State Action Plan for Clean Air** with Bank support. Recognizing the need for a new institutional model for AQM, the Government of Haryana, has constituted **ARJUN (AI for Resilient Jobs, Urban Air Quality & Next-Gen Skills), a pioneering special purpose vehicle (SPV)** that reimagines AQM governance through empowered leadership, AI-driven innovation, and multi-sector convergence to deliver clean air at scale. ARJUN will establish the institutional, technical and investment foundations needed for a long-term, integrated multisector program to evolve, replicate, and adapt practices over time.

E.2 PDO and Results Area

The Program Development Objective (PDO) is to strengthen air quality management and reduce emissions from priority sectors in Haryana.
The Program has two results areas (RAs):

- RA 1: Strengthening State Capabilities for Air Quality Management and Planning
- RA 2: Advancing Investments in Air Quality in Key Sector.

27. The beneficiaries include: (a) government officials who will receive training, capacity building, and access to global knowledge and technologies under the operation; (b) equipment and input suppliers, construction and engineering firms, and extension workers in the state whose products and services will be in higher demand; (c) small industries/enterprises in the state that will receive financial incentives will benefit from enhanced competitiveness; (d) state farmers who will receive financial incentives to purchase machinery; (e) individuals and fleet operators of electric 3Ws in Gurugram and Faridabad; (f) citizens of Gurugram and Faridabad who will benefit from reduced PM2.5 emissions due to the improved management of and investments in road and construction dust mitigation activities and cleaner transport;

(g) women employed in city bus operations in Gurugram and Faridabad and small-scale agro enterprises co-located with the livestock clusters in the State; and (h) state owned firms benefiting from new or improved or new access to better and cleaner technologies.

E.3 About the ESSA

In line with the World Bank's requirements for using the PforR instrument, as stipulated in the Program-for-Results Financing (Policy) and Directive, an Environmental and Social Systems Assessment (ESSA) was conducted, and this report was prepared. This ESSA examined (a) the potential environmental and social (E&S) effects of the Program (including direct, indirect, induced, and cumulative effects as relevant); (b) the borrower's capacity (legal framework, regulatory authority, organizational capacity, and performance) to manage those effects; (c) the comparison of the borrower's systems—laws, regulations, standards, procedures, and implementation performance—against the core E&S principles and key planning elements to identify any significant differences between them that could affect Program performance; (d) the likelihood that the proposed Program achieves its E&S objectives; and (e) recommendation of measures to address capacity for and performance on policy issues and specific operational aspects, relevant to managing the Program risks through a Program Action Plan (PAP). The assessment considered various World Bank requirements that include preliminary screening, stakeholder engagement, capacity assessment, and analysis of grievance mechanism.
The initial scope of the PforR program to which the ESSA applies has evolved during the program's design. Consequently, the ESSA analysis may still reflect certain broader aspects that will now be addressed under the complementary IPF operation. Nonetheless, the recommendations and actions outlined in the ESSA pertain exclusively to the PforR program.

E.4 Methodology Used for the ESSA

The methodology for the ESSA included (a) secondary literature review of applicable policies, legislations, schemes, program procedures, and institutional system; (b) screening; (c) site visits; (d) consultations—sectoral/focus group and at the state level; and (e) analysis and synthesis of strengths of the E&S systems and areas for improvement. These steps were followed for preparing the ESSA report highlighting the findings, recommendations, and suggesting inputs to the PAP and the Program Implementation Support Plan (PISP).

To inform the study, stakeholder consultations and key informant interviews were held with government representatives. Additionally, focus group discussions with crop residue management service providers (farmers, aggregators, and industry), the construction and demolition (C&D) sector (public sector construction agencies, C&D waste plant operators, and municipal corporations), and industry sector stakeholders were carried out between February and August 2024, and site visits were conducted in July 2025 to bus depots, roads, and electric vehicle charging stations. for project preparation. A state-level consultation workshop on the draft ESSA was conducted in November 2024, and the draft ESSA was disclosed when Department of Environment was the nodal entity of the Project. Following the creation of the SPV, ARJUN, the draft ESSA has been updated with the new implementation arrangement, and redisclosed on the Government of Haryana and the World Bank webpages.

E.5 Key Issues/Risks and Opportunities

Environmental risks are Substantial. The operation does not support building large new infrastructure, such as vehicle scrapping facilities, large boilers, or landfills, nor does it allow activities that could cause significant emissions or produce large amounts of waste and wastewater. However, some activities—like setting up air quality labs, electric vehicle (EV) charging stations, and bus depots—may still pose certain risks. These include: (a) hazardous waste generation from replacing or recycling vehicle batteries and old diesel generators; (b) dust and noise from minor construction, transportation, charging stations, and lab upgrades; and (c) occupational health and safety risks related to civil works, operating agricultural harvesting machinery, automated vehicle testing, and bus depot operations. These risks are limited in scope, localized, and reversible. They can be managed by applying appropriate mitigation measures, which are described in the ESSA. The relevant departments have the capacity to handle these impacts, with support from external consultants if needed. Additionally, PAP measures and the institutional structure within the SPV will help address any gaps in environmental management by ensuring a full-time environmental specialist is in place, promoting good practices among the SPV and implementing agencies, and drawing on sector experience.

Social risks are Substantial given that SPV ARJUN is newly formed with no prior experience on social safeguards. However, all risks can be managed through mitigation strategies built into the operational design, consistent systems and capacity development along with a few additional management measures under the PAP. Structured stakeholder engagement is embedded in the operational design to mobilize support and generate public awareness on air quality issues. The interventions proposed under air quality, transport, industry and agriculture example installation of EV charging facilities, renovation at bus depots, and upgradation of air quality laboratories will involve civil works with likelihood of labor deployment is expected with possibility of labor influx and related Sexual Exploitation, Abuse, and Sexual Harassment (SEA/SH) risks. Also, risks include community health and safety (CHS), including temporary restrictions of access, traffic and road safety risks, potential exposure to incidents and accidents, and worker health and safety, including working conditions. Women's safety issues will emerge with expanding transport-related services and entrepreneurship. There are also risks of exclusion of vulnerable beneficiaries, such as women, small and marginal farmers, and poor households, under RA 2. Land acquisition is not envisaged and there is no tribal population in Haryana. The gaps in systems and capacities to assess, manage, and monitor social risks are included in PAPs and a full-time Social Specialist is agreed to be hired in the SPV.

E.6 Assessment of Policy and Legal Framework

The policy and legal framework for E&S systems of the relevant sectors was found to be adequate and backed by a set of comprehensive laws, regulations, plans, and policies that are applicable nationally and statewide. While the provisions are adequate, institutional systems and capacities are needed for timely and effective enforcement of these laws and policies.

E.7 Assessment of Institutional Systems and Capacities

The nodal agency for the operation is the Special Purpose Vehicle (SPV) ARJUN *(AI for Resilient Jobs, Urban Air Quality & Next-Gen Skills*)**, within the Finance Department.** At the apex level, ARJUN will be headed by the Chief Principal Secretary to the Chief Minister (as Chairperson) and a Board of Directors

comprising of the Administrative Secretaries of Finance, Industries, Environment and Climate Change, Agriculture, Transport, Urban Local Bodies, and Rural Development. Leadership is provided by the Chief Ministers office, and Board of Directors facilitates high-level interdepartmental coordination, and provides policy and strategic directions for implementation. The process of Company incorporation, and formulation of management rules is under development.

Within the ARJUN SPV, a dedicated Project management unit for this operation will carry out project management, implementation, and MRV functions. The PMU will include full-time officers hired from the market responsible project implementation. Technical, procurement, finance, environment, and social functions will be housed in the PMU and will report to the CEO. They will also be responsible, either directly or through coordination and oversight, for ensuring compliance with the assessment findings, Program Action Plan (PAP) requirements, grievance redressal, labor management, and procurement and financial management.

At the district level, there will be program managers working with the District Administration and Metropolitan Development Authorities of Gurugram, Faridabad and Sonipat to support implementation on the ground. The **project contains 9 implementing entities (**SPV; Department of Transport; Department of Industry; Department of Agriculture; Directorate of Rural Development; Directorate of Urban Local Bodies; GMCBSL (operate buses in Gurugram and Faridabad); Haryana City Bus Services Ltd; HSPCB **)** . In addition, there will be 3 non-implementing agencies will receive and disburse funds through IAs: Department of Environment (to HSPCB); Gurugram Metropolitan Development Authority (to GMCBSL); Department of Town and Country Planning (to GMCBSL).

As strategic choices are made by multiple decision-makers and implemented by 9 different agencies in different functional areas and geographies, the structure allows the CEO to exercise control over the direction of the operation and chart the course that enhances operations performance. The strategic integration of AQM with the artificial intelligence program under the SPV, positions the SPV to better leverage digital platforms for tracking performance.

The assessment highlighted the need to strengthen their systems and procedures for (a) screening, management, and monitoring of E&S risks; (b) staff allocation and trainings; and (c) beneficiary and stakeholder engagement processes. The PMU will include full-time technical staff for an Environmental and a Social Specialist and other E&S functions in the PMU.

E.8 Exclusion Criteria

The operation excludes activities assessed to have a significant adverse impact on the environment and/or people as defined in the World Bank Policy and Directive on PforR Financing. Exclusions are further described in the Environmental and Social Systems Assessment (ESSA) and include large-scale biogas facilities, new C&D waste management or waste to energy facilities, and any activities involving land acquisition or with the potential for involuntary resettlement and forced eviction.

The following activities will not be included in the PforR Program of expenditures due to higher E&S risks: (a) establishment of a vehicle scrapping facility, (b) major/large-scale centralized industrial boiler plants/systems, (c) new landfill/ dumpsites, (d) any EVs using lead acid batteries, (e) construction of new buildings or any construction beyond the current footprint; (f) working on any structures which contain asbestos materials (AC roofing sheets, AC pipes, and so on), (g) any activity involving land acquisition, and

(h) any activity that may have potential involuntary resettlement and forced eviction—and will be excluded (screened out) from the World Bank Program.

E.9 Key Recommendations and Inputs to the Program Action Plan (PAP)

The assessment identified certain areas for improvement of the implementation of the E&S systems, which can be addressed through the following recommendations as in table E.1 and E.2.

Table E.1. Recommended E&S Actions for PAP

S. No.	Description	Timeline	By	Indicator for Completion
1.	Develop procedures / E&S checklist including Code of Practice to identify, manage, and monitor E&S risks and impacts of TA, construction works, greening activities, and transport infrastructure supported under the PforR. E&S Code of practice consists of good construction practices stemming from national regulation and legislation.	Checklist including E&S Code of Practice developed within six months of effectiveness and then administered every six months	ARJUN-SPV	Year 1: E&S screening checklist including Code or Practice, monitoring tool developed and adopted for rehabilitation of roads, and greening and transport interventions under the PforR Include relevant section of checklists in Procurement Packages Year 2 onwards: Checklist reviewed every six months
2.	Undertake periodic women safety audit of transport infrastructure supported under the PforR	Safety audit tool developed within six months of effectiveness and then administered every six months	PMU (ARJUN-SPV) in cooperation with DoT	Year 2: Women safety audit tool developed and piloted Year 2: Rolled out in depots, EV charging stations, three-wheeler stands, and automated testing station (ATS) Year 3 onwards: Women safety audit conducted every six months and report published annually, (ensure findings of previous report addressed in subsequent year).
3.	Develop E&S risk management skills	Plan, conduct, document regular E&S trainings	ARJUN-SPV	Year 1: Training needs assessment, module development, training calendar development for the entire project cycle Annually Recurring: Evidence of training conducted, and number of persons trained (topic wise, agency wise and gender disaggregated)

Table E.2. Recommendations Integrated in the Results Framework

Intermediate Indicators
• Increase in partnerships for collaboration with stakeholders and private sector (on awareness and behavior change campaigns, events, and consultations) • Accessible and effective grievance redressal for citizens and stakeholders • People benefiting from improved access to sustainable transport infrastructure and services • Women employed as technical and operational staff in city bus transport services.

To further strengthen the PAP implementation and overall environmental and social performance several segments have been embedded in DLIs and respective verification protocols.

Protocols Integrated into the DLI verification:
DLI6: Verification Protocol for Hazardous Waste Management: The DLI verification protocol encompasses compliance checks related to hazardous waste management. The independent verification of DLI6 will focus on confirming the decommissioning and dismantling of old DG sets and boilers at registered recycling facilities in a proper manner.

E.10 Implementation Support

The support by the World Bank during implementation of the Program will include the following:

I. Reviewing implementation progress and achievement of Program results on E&S risk management, including PAP and relevant DLIs, through the periodic independent verification agency (IVA) reports, implementation support missions, and any other E&S progress reports submitted by the Program Management Unit (PMU)
II. Assisting PMU at the SPV (ARJUN) the implementing agencies (IAs) in setting up systems and procedures to identify, manage, and monitor E&S risks/impacts
III. Supporting institutional capacity building on E&S management on a periodic basis
IV. Monitoring the performance of Program systems, including the implementation of agreed E&S systems strengthening measures as included in the PAP
V. Monitoring changes in Program risks related to E&S as well as compliance with the provisions of the legal covenants.
VI. In collaboration with the borrower, adapting E&S risk management practices in a manner consistent with PforR principles as necessary to improve Program implementation or to respond to unanticipated implementation challenges.

E.11 IPF - Component

The current operation combines two World Bank financing instruments: a Program-for-Results (PforR) component and an Investment Project Financing (IPF) component. The IPF supports activities that require specialized expertise or fall outside the government's regular expenditure framework. It includes four main components. The first focuses on transport through analytical studies such as a statewide public transport plan, restructuring of city bus SPVs, developing PPP models for automated vehicle testing, and a communications program to support adoption. The second targets agriculture and rural ammonia emission management by establishing monitoring networks, preparing cluster development plans,

developing and testing best practice packages for waste and fertilizer management, piloting demonstrations across clusters, and providing small grants for ex-situ crop and livestock waste management through a business promotion agency. The third addresses urban dust management in Gurugram and Faridabad, strengthening municipal capacity through diagnostic assessments, integration of dust minimization measures into regulations and street design, establishment of dedicated C&D management units, improved waste management planning, and urban greening initiatives. This also includes capacity building through training, awareness campaigns, demonstrations, peer learning, and enhanced monitoring systems. The fourth component provides project management support services. All IPF expenditures are managed separately from the PforR framework.

I PROGRAM DESCRIPTION

A. ENVIRONMENTAL AND SOCIAL SYSTEMS ASSESSMENT: PURPOSE AND OBJECTIVES

1. **An Environmental and Social Systems Assessment (ESSA) was carried out in line with Program.** This was undertaken to (a) identify the possible environmental and social (E&S) benefits/opportunities, risks, and impacts applicable to the interventions of the Program; (b) review the policy and legal framework related to the management of E&S impacts of Program interventions; (c) assess the institutional capability regarding E&S management systems within the Program system; (d) assess the performance of the Program system with respect to the basic principles of the Program-for-Results (PforR) instrument and identify gaps; and (e) submit recommendations and Program Action Plans (PAPs) to address gaps and improve performance during the Program's implementation.

2. The ESSA covered an assessment of the key Departments in the State of Haryana - Environment, Forest, and Climate Change (DoEFCC), municipal corporations, Transport, Agriculture, Urban, and Industries. The ESSA assessed or considered the extent to which the Program's E&S management systems are adequate for and consistent with six core E&S principles (Environmental and Social Management, Natural Habitats and Physical Cultural Resources, Public and Worker Safety, Land Acquisition, Indigenous Peoples and Vulnerable Groups, and Social Conflict)—hereafter, Core Principles, as may be applicable or relevant under PforR circumstances.

3. The findings, conclusions, and opinions expressed in this document are those of the World Bank and the recommended actions that flow from this analysis will be discussed and agreed with counterparts and will become legally binding agreements under the conditions of the new loan.

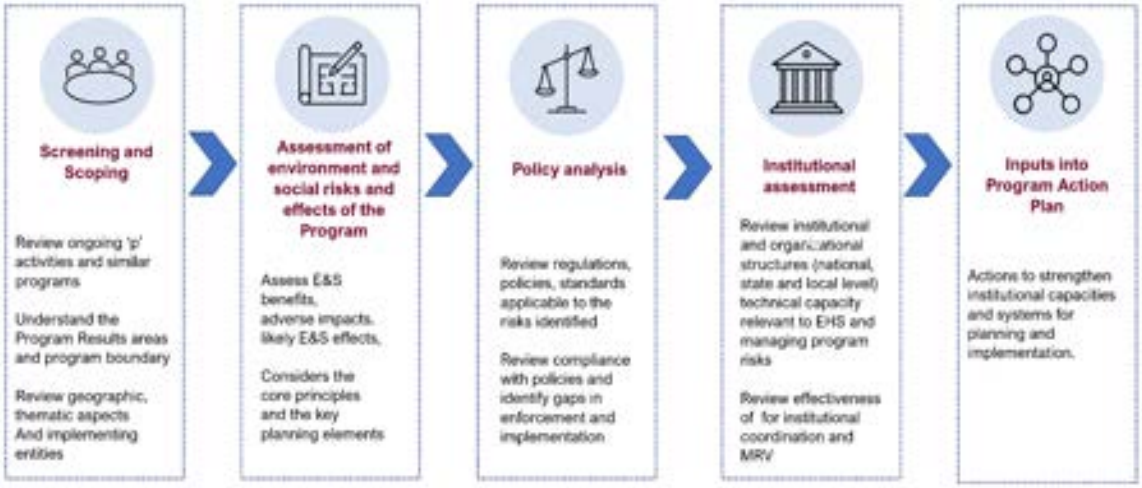
4. The initial scope of the PforR program to which the ESSA applies has evolved during the program's design. Consequently, the ESSA analysis may still reflect certain broader aspects that will now be addressed under the complementary IPF operation. Nonetheless, the recommendations and actions outlined in the ESSA pertain exclusively to the PforR program.

B. ESSA METHODOLOGY

5. The World Bank team prepared this ESSA report that provides an overview and analysis of the policies and regulatory frameworks of sector departments (Environment, Forest and Climate Change; Agriculture; Transport; Urban; Industries), to understand the impact of the Program on E&S aspects. The methodology included both secondary literature review and primary data collection. The team reviewed the relevant secondary literature before and during the conduct of the ESSA. The key documents included applicable acts, rules, policies, government orders, circulars, gazette notifications, guidelines, and bid documents, reports, and studies commissioned as part of Program preparation. The list of secondary literature reviewed is included in Annex 1. As part of primary data collection, the team held meetings and discussions with representatives of key government departments and agencies; technical institutions; micro, small, and medium enterprises (MSMEs); rural and urban local bodies; self-help groups (SHGs); civil society; and community members/citizens. The questionnaire for primary data collection is included in Annex 2. Field visits were also conducted to the C&D waste processing plant, bioenergy plant, and registered vehicle scrapping facility (RVSF) in and around Gurugram. In addition, visits to Faridabad and Gurugram bus stops and EV charging sites as well as roads for pavements were also done. The field visits covered the scope of both the PforR program and the complementary IPF operation. Details on meetings/consultations held are provided in Chapter IV and Annex 3.

6. The following tasks were involved in shaping the report.

Figure 1. Methodology Adopted for the ESSA



7. The draft ESSA has been disclosed before the Program appraisal so that the views of interested members of the broader public may be solicited and considered before Program approval. Further, the final ESSA report and recommended actions will be updated before negotiations, and the final version will be disclosed accordingly.

C. PROGRAM CONTEXT

8. The air pollution challenge in India is multisector and is linked to a wide range of economic activities. Addressing air quality challenges rests with changing many practices within urban, industrial, households, energy, transportation, and agricultural/rural areas that contribute to poor ambient air quality across a wider airshed. One of the most significant sources of $PM_{2.5}$ in India is secondary emissions that form when gases from various sources mix to create $PM_{2.5}$ and then travel far away from the original source, often crossing the boundaries of states. Almost 50 percent of the $PM_{2.5}$ emissions affecting Indian cities are secondary particulate matter (SPM), making air pollution a subregional, national, and even an international challenge for some Indian states.

9. Several measures have been taken by the Government of India (GoI). In 2019, the Ministry of Environment, Forest, and Climate Change (MoEFCC) launched the National Clean Air Program (NCAP) to consolidate fragmented air quality management (AQM) efforts into one national program with an ambitious goal of 40 percent reduction in $PM_{2.5}$ and PM_{10} concentration by 2026. In 2020, the XVth Finance Commission (FFC) allocated INR 12,139 crores (US$1.6 billion) in the first-of-its-kind performance-based fiscal transfers for air pollution to 42 mega-cities in India for the next 5 years (2021–26). In 2020, the Commission for Air Quality Management (AQM) for the National Capital Region (NCR) and adjoining areas (CAQM) was established to coordinate, regulate, and manage poor air quality for Delhi and five surrounding states and urban territories. Further, the National Knowledge Network (NKN) to complement NCAP implementation has been formed with India's Institutes of Repute to help strengthen institutional and human resource capacity for AQM across India.

10. Haryana grapples with air pollution stemming from its industrial and urban development, coupled with agricultural practices. Its average annual $PM_{2.5}$ concentration is around 76 $\mu g/m^3$ (population-weighted), surpassing the National Ambient Air Quality Standards (NAAQS) limit of 40 $\mu g/m^3$. While transport and industry have long been recognized as high pollution emitters, especially in large urban areas, poor agricultural practices are an overlooked and significant contributor to $PM_{2.5}$,

stemming from imbalanced application of fertilizers, poor management of animal waste, and crop residue burning. One of the most significant sources of $PM_{2.5}$ is "secondary" particles that form when ammonia (NH_3) and other N-gases emitted from agriculture and SO_2 and NO_x emitted from transport and industry sources mix to create secondary $PM_{2.5}$. Almost 30–40 percent of the $PM_{2.5}$ emissions impacting Haryana are secondary particulate matter (SPM). Currently, air quality management (AQM) planning is not prioritized and does not consider all sources and measures to reduce primary and secondary $PM_{2.5.}$

11. **Haryana is also centrally located at the heart of the nation's transportation network with a sizable number of old diesel heavy duty vehicles.** Recognizing that old and unfit vehicles, especially heavy-duty trucks, and buses, are major contributors of $PM_{2.5}$, the state has implemented necessary regulations to incentivize their phase out. **Agriculture is the second-highest contributor to $PM_{2.5}$ and is characterized by burning of crop residue, imbalanced use of nitrogen fertilizers, and poor management of livestock waste.** As a major agricultural state, changes in temperature and rainfall patterns can significantly impact crop yields and food security. **Gurugram and Faridabad are the most populated, economically significant, and most polluted part of the State.** Both cities have infrastructure gaps in public transport services and urban road infrastructure. According to the Gurugram Metropolitan City Bus Services Limited, there are 150 buses operating in Gurugram and only 50 in Faridabad, requiring strategic expansion to 1,025 and 595 buses respectively by 2031 to meet the needs of a growing population. **The industries sector requires a transition to cleaner, more efficient technologies.** The NCR districts contain seventy percent of Haryana's small and medium industries, which are regularly subjected to tightened regulations on fuel quality and technology. Industries are administratively grouped into clusters within a defined geographic area. These clusters benefit from shared resources, infrastructure, and knowledge, leading to increased productivity and competitiveness.

12. Addressing all air pollution sources will require time and long-term cooperation among many different stakeholders, given the nature of the investments, financing strategies, and implementation modalities. Following global experience, the Government has opted to use a multisectoral approach, to implement a set of prioritized investments in transport, agriculture, industries, and dust control within the Haryana State Action Plan for Clean Air with Bank support.

D. THE GOVERNMENT PROGRAM

13. The Haryana State Action Plan for Clean Air constitutes the government's medium-term pollution reduction plan with an acknowledged need for reduction in PM_{10} and $PM_{2.5}$ levels across eight key sectors over the next six years to meet national ambient air quality (NAAQS) Standards. It aims to mainstream air pollution reduction strategies in each of the eight sectors comprising of waste burning, construction dust, road dust, agriculture residue burning, vehicle emissions, industrial emissions, greening, and household emissions. The program encompasses 57 measures across policy, institutional, and investment across three results areas (RAs). The Bank financed Program will support a comprehensive update to the HCAP in 2031, which will include additional measures to control secondary particles, and it will be based on updated emission inventories and learnings from evaluations and implementation audits.

E. BANK-FINANCED PROGRAM: SCOPE, OBJECTIVES, AND KEY RESULTS AREAS

14. The World Bank-financed operation will support implementation of the Haryana Clean Air Project for Sustainable Development, focused on prioritized measures for PM2.5 emission reductions in three priority sectors – in the PforR transport, agriculture, industry and urban dust in the IPF. The operation will support activities across two interlinked Ras to effectively reduce PM2.5 emissions in Haryana in the four priority sectors. RA 1 supports the first PDO outcome by financing institutional strengthening measures, stakeholder engagement, and multisector convergence, and provides the basis for strategic management of the operation through a set of tools and a monitoring and results verification framework. RA 2 supports the second PDO outcome by financing emission reduction investments in the four priority sectors. The two RAs are designed to work optimally together as a system to achieve air quality outcomes outlined in the Theory of Change, and they embed institutional strengthening measures, fill critical policy and infrastructure gaps, and enhance the effectiveness of underlying implementation mechanisms through a systematic, step-by-step approach, as outlined in the disbursement-linked results (DLRs). The level of investment within each of the sectors was optimally selected to keep pace with the incremental development in institutional capabilities through the lifetime of the operation and to open the space for private sector participation. The operation also provides for predictable, stable, and consistent budget transfers from the state government over the duration of the project. The operation is critical in linking results with investments and will allow the government to use and strengthen systems already in place and provide the flexibility to adjust implementation timing and activities as needs arise.

PROGRAM DEVELOPMENT OBJECTIVE(S) AND RESULTS AREAS

15. The Program Development Objective (PDO) is to strengthen air quality management and reduce emissions from priority sectors in Haryana. The Program has two results areas (RAs): RA 1: Strengthening State Capabilities for Air Quality Management and Planning; RA 2: Advancing Investments in Air Quality in Key Sector.

DISBURSEMENT-LINKED INDICATORS

16. **Program resources will be disbursed based on the achievement of seven DLIs.** The achievement of all DLIs will be reviewed and confirmed by an independent verification agency (IVA).

Table 1. DLIs and Allocated Financing

DLI	Purpose of the DLI	US$ mill
DLI 1: State Plan Adaptive Management Process Established	This DLI incentivizes the establishment of a robust state air quality management planning process informed by evidence and data and backed by multi-sector set targets for emission reductions and has needed budget to support implementation. This will enable Haryana to target the right sources that will have the highest impact in reducing air pollution, while having the right accountability framework in place. A Prior action on setting up State special purpose vehicle for AQM is included in this DLI. The implementation agency for this DLI is the SPV Arjun	15
DLI 2: Air Quality management decision support system operational and informing strategic planning	This DLI incentivizes the establishment of a state-of-the-art AI enabled DSS for AQM that integrates real-time data and information and digital data ecosystem for the state. Once it is developed, the DSS will be used by the government to record, analyze, and report implementation performance of use the information to develop annual work plans and evaluate performance. The implementation agency for this DLI is the SPV Arjun	25

DLI 3.1: Transition to Cleaner Public Transport (Electric Bus Services)	This DLI incentivizes Gurugram, Faridabad, and Sonipat to strengthen their institutions (public bus service companies) and deploy bus services with supporting infrastructure and service provisions. This will also be supplemented by the EV transition plan to set up targets and develop an action plan for EV transition in two model electric mobility cities (Gurugram & Faridabad). These plans will guide long-term EV transition in the two cities. The DLI will track the amount of users/ ridership of the bus services. The implementing agencies for this DLI include GMCBSL (for Gurugram and Faridabad) and Haryana City Bus Services Ltd (for Sonipat).	120
DLI 3.2: Transition to Cleaner Public Transport (Electric 3-Wheeler)	The existing fleet of 3Ws is old diesel vehicle that are critical for last-mile connectivity in the cities. This DLI incentivizes Gurugram, Faridabad and other NCR cities to transition to electric 3Ws by offering financing incentives for scrapping old vehicles and purchasing new electric 3Ws with the necessary supporting infrastructure and service provisions. This will be complemented by a government mandate for increasing the share of e-3Ws as a part of the EV transition plan and establishing charging stations. The implementation agency for this DLI is the Department of Transport.	15
DLI 4: Reduction in the number of active fire locations due to crop residue burning across the State	Crop residue burning contributes substantially to deterioration in air quality in the winter season. This DLI incentivizes Haryana State to increase the quantities of crop residue that is collected and then utilized in situ or bailed for productive re-use such as for biochar/biogas/energy generation. The aim is to reduce the burning incidences by 90 percent as set forth in the Haryana Ex-Situ Management of Paddy Straw Policy 2023 and the State Action Plan for control of stubble burning during the paddy harvesting season, 2024. The implementing agency for this DLI is the Department of Agriculture.	30
DLI 5: Number of industries adopting cleaner technologies in select industrial clusters in Gurugram and Faridabad	The DLI will incentivize the adoption of cleaner technology. This will provide small industries with cost-effective proven technologies to reduce $PM_{2.5}$ to maintain competitiveness. The DLI will support a reduction in $PM_{2.5}$ and GHG emissions across small industry units. The reductions can be achieved partly by adopting cleaner, energy-efficient boilers (1000 units) and replacement of DG sets (1400 units). The implementing agency for this DLI is the Department of Industry.	30
DLI 6: Automated vehicle testing centers established for management of Heavy-Duty Vehicles	Polluting vehicles are defined as vehicles which are BS III or below and have completed 15 years. Implementing ATSs will streamline the process of assessing vehicle condition, ensuring that older vehicles over eight years undergo mandatory emission and fitness testing and are phased out. To incentivize the accelerated adoption of ATSs, this DLI will provide performance-based allocations to the first 10 automated stations that are established and operational for six months. The implementation agency for this DLI is the Department of Transport. Grant financed activities will support achievement of this DLI through technical advisory services for development of a PPP model for automated vehicle testing, and supporting communications and behaviour change around this.	5

Note: DoA = Department of Agriculture; DoF = Department of Finance; DoI = Department of Industries; DoT = Department of Transport; DoUD = Department of Urban Development.

PROGRAM IMPLEMENTATION ARRANGEMENTS

17. The nodal agency responsible for the operation is the Special Purpose Vehicle (SPV) ARJUN, within the Planning Department. Given that the operation addresses air quality, a complex, multi-sectoral challenge, it necessitates the active participation of 9 implementing agencies across the

state (including the SPV). This multi-agency involvement is essential because air pollution arises from diverse sources spanning various sectors; focusing on only a few sub-sectors would be insufficient to achieve meaningful improvements in air quality. To effectively manage this complexity, the State Cabinet has approved ARJUN (AI for Resilient Jobs, Urban Air Quality and Next Gen Skills) as the primary implementing vehicle to lead and manage the multi-sector air quality management operation. At the highest level, ARJUN is chaired by the Chief Principal Secretary to the Chief Minister, supported by a Board of Directors comprising Administrative Secretaries from implementing departments including Finance, Industries, Environment and Climate Change, Agriculture, Transport, Urban Local Bodies, and Rural Development. This leadership structure, anchored in the Chief Minister's office, ensures strong political backing and facilitates high-level interdepartmental coordination. The Board provides strategic guidance, approves annual work plans, and reviews outputs linked to Disbursement Linked Indicators (DLIs). Operationally, the SPV is headed by a Chief Executive Officer (CEO), supported by a Joint CEO deputed by the Government of Haryana (GoH). The SPV was formally approved as a Section 8 Company by the GoH cabinet on May 5, 2025, with the CEO and Joint CEO officially assigned their roles and responsibilities. The process of the company incorporation, and formulation of management rules is under development, and will be finalised prior to negotiations.

18. Within the SPV ARJUN, there will be a dedicated PMU for this operation which will include full-time officers hired from the market responsible for project management and implementation. Technical, procurement, finance, environment, and social functions will be housed in the PMU and will report to the CEO. They will also be responsible, either directly or through coordination and oversight, for ensuring compliance with the relevant fiduciary and environmental and social (E&S) assessment findings, Program Action Plan (PAP) requirements, grievance redressal, labor management, and procurement and financial management. At the district level, there will be program managers working with the District Administration and Metropolitan Development Authorities of Gurugram, Faridabad and Sonipat to support implementation on the ground in their respective districts. The operations has 9 implementing entities (including the SPV) comprising of departments, city bus companies and ULBs that will implement the activities linked to the DLIs under the PforR and activities under the IPF. The grant-financed activities will follow the same institutional and implementation arrangements as the operation. More details the institutional and implementation arrangements is provided in Annex 2 and the Technical Assessment.

19. The monitoring of this operation will comprise of progress monitoring, verification of DLRs and DLIs by the Independent verification agency (IVA), and evaluations for learning and scale-up. The PMU will be responsible for monitoring, evaluating, and reporting progress toward the achievement of the PDO across the operation using the results framework, and the IAs will be responsible for monitoring and reporting to Program Director in the PMU on their respective activities. An Operations Manual will be developed with elaboration on the operations M&E framework and process to be followed by the IAs. The IVA, hired by ARJUN, will conduct annual and biannual DLI assessments and prepare a consolidated report furnishing evidence toward the achievement of DLRs with recommendations for the drawing up of funds. The IVA report will be submitted to the PMU for review and submission to the Steering and Government Committees and, upon approval, it will be submitted to the World Bank and other financing partners for affecting disbursements. The PMU will undertake or support the following impact evaluation activities: (a) impact evaluation at midterm and end term; (b) specific sectoral (thematic) evaluations, as required; and (c) process monitoring and periodic tracking surveys and compilation of good practices emerging from the operation for knowledge sharing among stakeholders within and outside the state.

20. Disbursement Arrangements: The operation design rests on analytics which prioritize investments for the highest impact, builds on strong government ownership, and reflects lessons from international experience. The sector and sub-sector selection of measures followed a rigorous scientific method using the GAINS model to identify (a) sector contributions and their sources throughout the entire state of Haryana; (b) determination of how effective both the current measures applied under the existing state program and the additional measures needed will be in reducing PM2.5 emissions; and where further potential relies on efficient fertilizer use; and (c) development of a marginal abatement cost curve to define lowest cost and highest impact measures. When accounting for the highest potential reduction based on the highest contribution to PM2.5 at the state level, the priority would be road and construction dust, followed by crop residue burning, heavy-duty vehicles (trucks, buses), and urban waste management. Investments have been prioritized based on analytics, political economy, and operational efficiency. Result chains were developed for each prioritized sector to arrive at DLI selection, aligned with the operation's Theory of Change, to better understand the underlying activities needed to reach the results. The DLIs and DLRs have been carefully selected and discussed in department meetings to ensure relevance, and they are appropriately sequenced to enable the achievement of the result. Implementing entities, state line departments, and the Finance Department support the DLI selection and use of the IPF modality to support ammonia and N-gas management and control interventions. The technical soundness of the operation is also reflected in the sector-specific results that it prioritizes.

F. IPF COMPONENT OF THE OPERATION

21. The current operation has a hybrid form that combines two financial instruments of the World Bank; (a) a Program component (also referred to as Program-for-Results) and (b) an Investment Project Financing (IPF) component (also referred to as the Project). IPF component, supported by is designed to fund activities that require specialized expertise or fall outside the government's regular expenditure framework. The IPF is structured into four main components. The first component focuses on transport, allocating US$2 million for analytical studies such as developing a statewide public transport plan, restructuring city bus SPVs, designing a PPP model for automated vehicle testing, and creating a communications program to promote its adoption. The second component, with a US$46 million allocation, targets agriculture and rural ammonia emission management. It supports the establishment and operation of a monitoring network for ammonia and nitrogen gases, the preparation of cluster development plans for crop residue and livestock waste management, and the development and field testing of packages of practices for livestock waste and fertilizer use optimization. This component also includes demonstration pilots in 150 clusters to showcase best practices in manure management, as well as small grants to enterprises for ex-situ management of paddy and livestock waste. These grants will be facilitated by a business promotion agency, with a manual for matching grants to be developed after the agency is onboarded in the second year. The third component, urban dust management, allocates US$10 million to strengthen the capacities of municipal bodies in Gurugram and Faridabad. Activities include diagnostic assessments and gap analyses of construction and demolition (C&D) waste and dust sources, integration of dust minimization strategies into street design and building byelaws, development of enforcement and incentive frameworks, establishment of dedicated C&D management units, and creation of long-term roadmaps for integrated C&D waste and dust mitigation. Additionally, this component will assess and plan for improvements in solid waste management, aiming to reduce landfill methane emissions and promote urban greening, including bioremediation. Technical capacity will be enhanced through targeted training for municipal staff, engineers, and contractors, public awareness campaigns, hands-on demonstrations, peer-learning visits, and advice on monitoring and reporting systems. The fourth

component provides for project management support services. All IPF expenditures are managed through separate contracts and are not included in the PforR expenditure framework.

22. In addition to the E&S measures to be included in the PAP, an Environmental and Social Commitment (ESCP) and Labor Management Procedures (LMP) have been prepared to meet the World Bank's Environmental and Social Framework (ESF) requirement. While a Citizen and Stakeholder Engagement Plan is embedded in the PforR program (RA 1), a simplified Stakeholder Engagement Plan (SEP) is prepared covering only the IPF/TA component activities.

II DESCRIPTION OF POTENTIAL ENVIRONMENTAL AND SOCIAL EFFECTS

18. This section describes the activities to be implemented under each of the RAs with corresponding potential E&S effects that could arise from each activity. The sections below summarize the E&S risks, benefits, and opportunities of the Program.

ENVIRONMENTAL BENEFITS AND OPPORTUNITIES

19. The Program will result in multiple benefits and opportunities for better environment, health, and safety (EHS) performance. These include systemic benefits such as (a) better transparency of environmental/air quality data (ambient and industry) and implications on people based on environmental health risk; (b) boosting of manpower and enhancing of capacities in the SPV - PMU and key implementing agencies for better management of air pollution and stakeholder engagement; (c) strengthened institutional development and multisector coordination for air quality/airshed management and a developed air quality platform that can be used for informed decision-making and public engagement (e) establishing of a site-level monitoring network to track evidence-based and improved agriculture management practices applied in fields; and (f) enhanced capacities for developing SOPs. In addition, the sectoral interventions will result in direct emission reductions from crop residue burning, vehicular emissions, inefficient boilers and old diesel generator (DG) sets, and so on. The Program offers further opportunities for greening the urban areas (avenue plantations).

LIKELY ENVIRONMENTAL EFFECTS

The environmental effects of the Program are expected to be Substantial. These include (a) hazardous waste generation from replacing or recycling vehicle batteries and old diesel generators; (b) dust and noise from minor construction, transportation, charging stations, and lab upgrades; and (c) occupational health and safety risks related to civil works, operating agricultural harvesting machinery, automated vehicle testing, and bus depot operations. These risks are limited in scope, localized, and reversible. They can be managed by applying appropriate mitigation measures, which are described in the ESSA. The relevant departments have the capacity to handle these impacts, with support from external consultants if needed. Additionally, PAP measures and the institutional structure within the SPV will help address any gaps in environmental management by ensuring a full-time environmental specialist is in place, promoting good practices among the SPV and implementing agencies, and drawing on sector experience.

20. The Program will not create an additional environmental impact as it will not support construction of large new infrastructure or the extraction of natural resources. It does not include any activities that may lead to heavy emissions or generation and discharge of large volumes of waste. The Program activities do not require Environmental Impact Assessments (EIAs) as per the regulatory system, but environmental considerations are managed through contractors getting permits and consents from the HSPCB. These are simple, standard, and well-established regulatory requirements.

The multisector PMU will help in bridging knowledge gaps between the SPV, DOEFCC and the sectors on good practices for dust suppression, waste management, and noise suppression techniques.

21. Most of the minor infrastructure/upgrade works under the program (AQM monitoring stations, automated testing stations (ATSs), e-vehicle charging facilities,etc.) will take place in the land within the urban area, allocated by the government. These works and operations may involve excavation and levelling, noise and dust pollution, OHS and community, health and safety risks, and generation of localized waste which need to be dealt with using appropriate contractual agreements and good practices on EHS management. It is also critical to have agreements for extended producer responsibility for e-waste, batteries and hazardous waste management in place to minimize environmental impacts from adopting advanced technologies and data systems.

SOCIAL BENEFITS AND OPPORTUNITIES

22. The operation is expected to result in improved air quality in select sectors and pollution hotspots; energy efficiency and cost saving; reduction in emissions, dust, and air pollution; long-term climate benefits; and improved health and overall well-being of the state's residents and those living in the Indo-Gangetic Plains (IGP). The Program is also expected to improve public awareness about air quality issues through information, education, and communication (IEC); behavior change communication (BCC); proactive public disclosure of air quality-related information; and grievance redressal for improved transparency. Coordinated response among relevant stakeholders will result in efficiency and bring about accountability. The Program will focus on increasing the share of women in formal salaried employment and supporting women-led MSMEs under RA 2. Further, interventions in the agriculture sectors are likely to improve farm-level efficiencies, enhanced farm productivity, and alternate uses of crop residue—resulting in likely improvements in incomes of poor and marginalized farmers. In addition, program investments in the transport sector are expected to improve public transport infrastructure and services leading to improved mobility for commuters, particularly women and children.

LIKELY SOCIAL EFFECTS

23. The social risks and impacts of Program investments are expected to be Substantial and due to the novel nature of implementing arrangements, need to be consistently reviewed through recommended mitigated strategies built into the Program design and additional measures. The Program envisages infrastructure development like road pavements, upgradation and renovation of bus depts to accommodate fleet of electric buses with charging facilities, EV charging stations, upgradation of air quality monitoring, testing laboratories, and greening initiatives. Land acquisition is not anticipated- encumbrance-free land available with government agencies will be transferred and utilized for activities under the Program. The scale of construction likely to deploy labor from outside leading to labor influx related risks as well as and related sexual exploitation and abuse (SEA)/sexual harassment (SH) risks. In addition, there are risks related to community and OHS emerging from activities related to C&D management (such as rehabilitation of urban roads), EV charging facilities, Depots, ATS, heavy duty vehicles, greening initiatives, and conversion to cleaner boilers. These may include temporary inconveniences to public, temporary shifting of street vendors (during greening initiatives and road rehabilitation), traffic and road safety risk, potential exposure to incidents and accidents, workers' health and safety including their working condition. The Program's intent to mainstream stakeholder engagement will contribute to increased general awareness and positive behavior change around pollution reduction and air quality improvement, to manage risks of stakeholders' willingness and sensitization to switch to cleaner fleet through inadequate outreach on policy changes are other potential concerns. There are however, risks of vulnerable beneficiaries such

as women, marginalized and small-holder farmers, and members of poor households from getting excluded from receiving benefits of investments proposed under RA 2.

24. For further details related to potential environmental, social, health, and safety (ESHS) risks and opportunities refer to Annex- 4.

25. The SPV will have a full time Environmental and a Social Specialist to ensure management of risks, reporting on mitigation measures and PAPs.

III ASSESSMENT OF BORROWER'S ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEMS RELEVANT TO THE PROGRAM

A. INTRODUCTION

1. This chapter assesses whether the Program's E&S management systems are consistent with the core principles and key planning elements contained in the PforR Policy and whether the involved institutions have the requisite capacity to implement these systems' requirements. Both elements (for example, Program systems and capacity) are necessary to ensure that the E&S effects identified in Chapter II are effectively managed.[1] Through the analyses, the ESSA team has identified gaps in both areas, which are addressed in Inputs to the PAP and Supplemental actions (Chapter V).

B. PROGRAM SYSTEMS: LEGAL, REGULATORY SYSTEMS AND FRAMEWORKS

ENVIRONMENT

26. Overall, the applicable environmental regulatory system is comprehensive enough to address underlying E&S risks, and noteworthy strengths are Environmental Protection Act 1986; Air (Prevention and Control of Pollution) Act, 1981 (to take measures to mitigate air pollution); Water (Prevention and Control of Pollution) Act, 1974 (to prevent and control water pollution by regulating the discharge of pollutants into water bodies); Construction and Demolition Waste Management Rules, 2016 (to effectively tackle the issues of pollution and waste management); E-Waste management Rules, 2022 (to manage e-waste in an environmentally sound manner and put in place an improved extended producer responsibility); Solid Waste Management Rules, 2016 (to improve the collection, segregation, recycling, treatment, and disposal of solid waste in an environmentally sound manner); Hazardous Waste Management Rules, 2016 (to ensure safe handling, generation, processing, treatment, package, storage, transportation, use reprocessing, collection, conversion, and offering for sale, destruction, and disposal of hazardous waste); the Occupational Safety, Health and Working Conditions Code, 2020 (to consolidate and amend the laws regulating the occupational safety, health, and working conditions of the persons employed); and the Boilers Act, 1923 (to protect

[1] Program systems constituted by the rules and "arrangements within a Program for managing environmental and social effects," including "institutional, organizational, and procedural considerations that are relevant to environmental and social management" and that provide "authority" to those institutions involved in the Program "to achieve environmental and social objectives against the range of environmental and social impacts that may be associated with the Program." This includes existing laws, policies, rules, regulations, procedures, and implementing guidelines, and so on that are applicable to the Program or the management of its environmental and social effects. It also includes interagency coordination arrangements if there are shared implementation responsibilities in practice. Program capacity is the 'organizational capacity' of the institutions authorized to undertake environmental and social management actions to achieve effectively 'environmental and social objectives against the range of environmental and social impacts that may be associated with the Program'.

people's lives and property from the dangers of steam boiler explosions and create uniformity in registration and inspection during boiler operation and maintenance in India).

27. Environmental regulations for air and water pollution and waste management are institutionalized for management of all industries, ensuring sound environmental management of these facilities. Agriculture policies promote a circular economy approach through sustainable practices for managing crop residues for various purposes such as composting, bioenergy, and fodder ensuing that surplus agriculture waste is not burned. For controlling vehicular emissions, the government has mandated automated fitness testing for commercial vehicles at authorized testing centers and fitness certificates are required for all vehicles on the road. Another initiative taken up is to encourage scrapping of old vehicles by providing incentives as well as disincentives under the vehicle scrappage policy through the existing scrappage facilities in the state.

> One of the hazardous wastes that will be generated through the Program interventions is lead acid batteries from battery changes in EVs as well as replacement of the old DG sets. These wastes can pose significant environment and health risks due to the presence of lead and sulfuric acid. The Hazardous Waste Management Rules, 2016, set stringent guidelines for collecting, storing, transporting, and disposing of these wastes. As per the ESSA findings, backed by field visits, the registered scrapping facilities are strictly adhering to the rules by sending the lead acid batteries to the recyclers who are authorized and licensed by the HSPCB, who will further recover and dispose of the wastes as per the standards prescribed by the CPCB. The rules also mandate proper recordkeeping and reporting by the recyclers. The HSPCB provides necessary guidance (trainings as per the need) and monitors these facilities on a regular basis to verify the adherence to the prescribed standards. The program also included the verification of decommissioning/dismantling of DG sets under independent verification of DLI6.

28. The key environmental laws and regulations establish the regulatory framework for pollution control, EIAs, waste management, and conservation of natural resources. While the legal framework is comprehensive, its implementation has faced challenges. Improving enforcement mechanisms by the HSPCB and enhancing public participation are key areas that require continuous attention and improvement to achieve better environmental outcomes that will be done through the Program.

SOCIAL

29. Overall, the national- and state-level policies were found to be adequate to address the social risks related to the project investments, including those for ensuring OHS for workers and fair working conditions, women's safety, inclusion, grievance redressal, and access to information. These include Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996; Minimum Wages Act, 1948; Payment of Wages Act, 1936; Payment of Gratuity Act, 1972; Workmen's Compensation Act, 1923; Maternity Benefit Act, 1961; Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979; Motor Transport Workers Act, 1961; Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013; Rights of Persons with Disabilities Act, 2016; Haryana Right to Service Act, 2014; and Right to Information Act, 2005. For a detailed analysis of relevant ESHS laws and policies, refer to Annex 5.

30. There are also policy-based incentives and guidelines, programs, and schemes that support better E&S outcomes in each sector linked to the project results, including the following:

- **Agriculture.** SAMARTH (Sustainable Agrarian Mission on use of Agro - Residue in Thermal Power Plants), a mission set up to promote co-firing through the use of biomass pellets including agro-residue with coal in thermal power plants—to address the issue of air pollution from stubble burning and reduce the carbon footprint generated by thermal power plants. At the state level, the Haryana Bio-Energy Policy, notified in 2018, provides

exemptions from fee payment, stamp duty charges, and charges for issuing consent to establish (CTE) and consent to operate (CTO) for setting up biomass plants anywhere in the state.

- The Agriculture Department is also implementing other schemes and programs that focus on reducing crop residue burning, promoting organic and natural farming, and encouraging crop diversification and water use efficiency. *Paramparagat Krishi Vikas Yojana* (Traditional Farming Improvement Programme), which is under the National Mission on Sustainable Agriculture (NMSA), promotes organic farming through demonstrations. The Promotion of Agricultural Mechanization for In-Situ Management of Crop Residue program provides machinery support on subsidy to encourage the small and marginal farmers to forgo crop residue burning. On similar lines, the Sub-Mission on Agricultural Mechanization scheme provides subsidies to individual farmers as well as supports village tool banks. Under the State Plan Scheme for Management of Crop Residue, there is provision of incentives for management of crop residue by making bales. Under the '*Har Khet Swasth Khet***/**Soil Health Card for every acre of Agricultural Land' program, each acre of agricultural land of the state is being sampled and tested. Subsidy is also provided for crop diversification under the *Mera Pani Meri Virasat* scheme. Cluster demonstration of alternative crops such as maize, cotton, oilseed, onion, fodder, and fruit/vegetable crops are undertaken. Farmers are provided with a grant for adoption.

- **Transport.** The Haryana EV Policy provides fixed incentives for both manufacturers and buyers to promote purchase of all types of EVs. The EV Policy further provides skill development incentives to MSMEs and promotes the need for including courses on repair of EV in ITIs. The policy also incentivizes setting up of EV charging stations in existing private buildings, thus minimizing land-related impacts. The Haryana Vehicles Scrappage Policy was also notified in 2022 which targets scrapping of 1 crore unfit vehicles based on their fitness, irrespective of vehicle age, followed by an automated fitness test. The policy provides the following two incentives: (a) motor vehicle tax rebate to the extent of 10 percent of the motor vehicle tax to be charged from new motor vehicle being purchased or 50 percent of the scrap value as mentioned in the certificate of deposit, whichever is lower, and (b) registration fee rebate to the extent of 25 percent on the registration of a new vehicle purchased on the basis of a certificate of deposit. Further, the policy outlines key steps for facilitating setting up of ATSs and RVSFs. Designated and authorized facilities exist for removal/recycling or disposal of automotive hazardous waste such as tires, batteries, and so on, as per the Central Pollution Control Board (CPCB) Guidelines.

- **Construction dust.** The Haryana Construction and Demolition Waste Management Rules, 2016, and Haryana Solid Waste Management Policy, 2018, address the need for creating public awareness through an IEC campaign on waste management. It also introduces 'polluters pay principal' by collecting user chargers from the waste generators. The Haryana C&D Waste Management Policy, 2020 allows for setting up of a mobile or semi-mobile C&D waste processing plant, due to paucity of encumbrance-free land.

- **Industry and MSMEs.** The GoH has notified a Scheme 'Assistance in conversion of boiler to run on cleaner fuels' in March 2023, wherein it provides 30 percent of the capital expenditure to MSMEs for conversion of their boilers from coal or diesel to cleaner fuels. Enterprise promotion policy highlights labor and environment reforms and best practices. Timely clearances of environment and pollution-related consents, permits,

and so on within a prescribed time window through single window clearance system, CTE and CTO, renewals and online consent management, boiler registration, approval for modification repairs, alteration of boilers, registration for processing hazardous waste, inspections and online monitoring for effluents and emissions, and Programme to Accelerate Development for MSME Advancement. Haryana MSME Policy 2019 focusses on increased adoption of modernized technology and upgrade through capacity building and institutional strengthening of MSME-related Government support agencies. Green and clean technologies, waste minimization and recycling, and so on are promoted. Subsidies are offered for constructing an effluent treatment plant and sewage treatment plant, especially zero discharge systems.

C. PROGRAM CAPACITIES: INSTITUTIONAL AND ORGANIZATIONAL ASSESSMENT

Table 2. Institutional Capacity Gaps on EHS and Social Risk Management

Institution	Government Program	Capacity Gap Analysis
SPV (ARJUN)*2*	A dedicated Special Purpose Vehicle to ensure institutional continuity, flexibility, and coordination across departments.	New institution with no prior experience of implementing WB projects. Full time Specialists to be appointed. Their ToRs to be reviewed by WB team and capacity support provided by WB E&S Specialists.
Department of Environment, Forest and Climate Change (DoEFCC)	• Haryana State Action Plan for Clean Air (HCAP) • Environmental Information, Awareness, Capacity Building and Livelihood Programme (EIACP) • Environmental Education Programme (EEP)	• The Pollution Control Board (PCB) is handling multiple responsibilities of enforcement of various environmental acts, monitoring and handling the violations, and generating awareness among public. The capacities of the personnel need to be enhanced through trainings on state-of-the-art green technologies/solutions. • Application of the E&S screening checklist in the planning phase is needed to ensure that site selection for any physical investments such as setting up of labs and so on does not lead to any negative impacts in the surrounding environment or to any physical or economic displacement. • IEC activities are earmarked through the Annual Action Plan. However, there is a need for a system to periodically monitor and measure outcomes of IEC planning and implementation. In addition, there is a need to engage additional human resources or create partnerships with civil society organizations in generating awareness.
Department of Agriculture (DoA)	• Paramparagat Krishi Vikas Yojana (PKVY) • Rashtriya Krishi Vikas Yojana (RKVY) • Promotion of Agricultural Mechanization for In-Situ Management of Crop Residue Punjab, Haryana, Uttar Pradesh and NCT of Delhi • Sub-Mission on Agricultural	• The programs and schemes being implemented by the department are by and large environmentally benign in nature and are in alignment with proposed Program. The department has adequate capacity to implement the proposed activities without any additional requirement of an environmental cell/division. However, additional trainings/orientations on aspects such as worker safety, efficient use, and maintenance of machinery are needed.

2 To ensure effective implementation and cross-sectoral coordination of externally aided projects, it is proposed to establish a Special Purpose Vehicle (SPV) under Section 8 of The Companies Act, 2013. The formation of the SPV was approved by the Standing Finance Committee (SFC-C) chaired by the Chief Minister on 17th April 2025. Through this memorandum, concurrence is sought for the SFC's approval, and formal approval is requested for the detailed structure of the SPV.

	Mechanization • State Plan Scheme for Management of Crop Residue • Haryana Pragatisheel Kisan Yojna • Har Khet Swasth Khet • Crop Diversification programme - Mera Pani Meri Virasat • National Project on Organic Farming (NPOF) • Pradhan Mantri Krishi Sinchai Yojana (PMKSY) • Biogas Development and Utilization Program • National Mission for Sustainable Agriculture (NMSA) • Haryana Bio-Energy Policy	• Further, IEC and BCC activities on crop residue burning—mostly confined to peak season—need to be planned and carried out throughout the year. • There is also the need to augment capacities in the process for selection of clusters and beneficiaries—particularly marginalized farmers, female entrepreneurs, and SHGs in value chains for crop residue (briquette, pellet, biofuels, and pulp and paper products). • Except for the CM Window, the department does not have a formal process of documentation of grievances.
Department of Transport (DoT)	• Motor Vehicle Act, 1988 • Voluntary Vehicle Fleet Modernization Program (V-VMP) • Haryana Vehicle Scrappage Policy • Haryana EV Policy	• The policies and programs have intrinsic integration of environmental benefits through interventions targeting or leading to emission reductions and batteries disposal. • As part of implementation of the current program, the modules on E&S management need to be integrated into the capacity-building initiatives during the program. • For vehicle scrapping activities, additional trainings on hazardous waste disposal, worker safety, community safety and so on need to be integrated and comprehensive monitoring and audits should be organized to verify HSPCB's adherence to SOPs. • An E&S screening checklist needs to be applied for ATSs and electronic charging stations, and an Environmental and Social Code of Practice should be prepared and implemented based on the need. • There is a need to integrate gender-inclusive designs in depot infrastructure, EV facilities, and bus services and assess if they meet the requirements of women and persons with disabilities (PwD). • Periodic monitoring of transport workers' health and safety including their conditions of work and SEA/SH risks, particularly of female workers in depots and buses, is needed. • Further, extensive IEC and BCC activities need to be undertaken to garner public support in implementing the policy of mandatory fitness for vehicles after their critical age.
Department of Urban Development (DoUD)*3*	• Swachh Bharat Mission • Finance Commission Solid Waste Management Grants • Haryana C&D Waste Management Policy	• The application of an E&S screening checklist and preparation and implementation of the Environmental and Social Code of Practice need to be integrated into the C&D pilots and greening activities. • The capacity-building initiatives for the department functionaries should include modules on E&S for better understanding of the

3 *This particular activity will now be covered under IPF component in a reduced scope.*

		same. • Limited IEC and BCC activities have been undertaken on C&D waste management including uptake of reprocessed C&D waste, particularly with small contractors and consumers. • Training initiatives and SOPs must capture risks related to workers and community health and safety (CHS), including grievance management during C&D management for better understanding of the same. E&S COP should be developed for SOPs. • Periodic monitoring of workers' health and safety including their conditions of work, particularly of female workers engaged in C&D waste management, is needed.
Department of Industries (DoI)/Directorate of Micro Small and Medium Enterprises	Haryana MSME Policy, 2019 Enterprise Promotion Policy Programme to Accelerate Development for MSME Advancement	• Based on the desk review, it is found that the department under MSME policy promotes (a) Increased adoption of modernized technology and upgrade through capacity building and institutional strengthening and (b) green and clean technologies, waste minimization and recycling, and so on. • Under Enterprise Promotion Policy, the department promotes (a) labor and environment reforms and best practices and (b) timely clearances of environment and pollution-related consents, permits, and so on within a prescribed time window through a single window clearance system. • The MSME Directorate has a Facilitation Helpdesk, Feedback, and Grievance portal on its website. The portal allows for filing of anonymous feedback and grievances pertaining to any related matter. • The capacity of the department will be reassessed at the stage of Program appraisal.

Adequacy and Capacity of Environment Management Systems

32. Neither the SPV (ARJUN), is a new entity, nor the remaining implementing agencies (IAs) of the Program do not have experience with the implementation of World Bank operations. However, many of the government programs already under implementation by these departments (Agriculture, Transport, Urban, and MSME) are in alignment with the Program interventions. The Program intended result areas are largely consistent with positive environmental outcomes and have low-to-moderate effects. PMU at SPV (ARJUN) will actively monitor, coordinate and provide technical support in bridging any gaps between the environmental authorities and the sectors on good environment practices such as dust mitigation, management of waste, and noise suppression. A dedicated full time environment specialist at the AQM PMU of the SPV (ARJUN) will ensure integration of environmental aspects across the sector wise program activities and monitor and report on compliances. The management systems are robust enough to address any unintended negative impacts (from minor civil works and dust and waste management and so on); however, the implementation/application will need strengthening.

33. There is no separate environmental cell or division in the SPV or the IAs/departments associated with E&S risk management. Additionally, environmental effects are generally managed within the functions at the various levels of the department. The implementing entities/departments

can mainstream E&S screening and EHS and OHS monitoring and training. Overall, in terms of environmental performance, the departments (Agriculture, Industry and Transport) are clearly committed to promote environmentally responsible practices. Their technical capacity and knowledge were found to be acceptable, but due diligence and processes can be further strengthened as outlined in the PAP and Program Operations Manual (POM).

Adequacy and Capacity of Social Management Systems

34. The SPV and other implementing departments have limited capacities related to social risk management at varying degrees. These include resource allocation, training, system and procedures for screening and assessment, monitoring and evidence-based reporting on community and workers' health and safety, land management, gender, social inclusion, grievance management, and stakeholder engagement including IEC activities and their outcomes. The Program will need to engage with vulnerable groups of stakeholders such as poor households, small and marginal farmers, female entrepreneurs, and commuters using public transport (PwD, women, children, and senior citizens). To ensure that the social risks and effects flagged in the ESSA are mitigated, reasonable measures will be recommended for SPV (ARJUN) and the implementing institutions to consider. The Program will need to deploy a full-time social development specialist in the AQM PMU of the ARJUN SPV, to assess the capacity gaps, and undertake regular training of the staff and consultants of the IAs and the participating institutions on identified themes.

35. **Grievance redressal mechanism.** Most complaints across all implementing departments including are received through the CM grievance redressal portal, that is, CM Window/Jan Samwaad. The portal is linked with CPGRAMS where grievances from other states can be tracked as well. Grievances are registered at the CM Window counters at e-Disha Kendras and Sub-Division Offices or can be registered online at http://cmharyanacell.nic.in. The complainants must submit their grievance along with their Aadhar number at the counter. Once this is registered, the complainant receives an SMS on his/her mobile phone with the grievance registration number. The complainant can use this number to track the status of the grievance. The grievances are then sent to the District Collector and Sub-Divisional Magistrate Office, where each grievance is marked and shared with the concerned department. Once the grievance is resolved and the complainant is satisfied, an Action Taken Report (ATR) is uploaded by the department on the CM Window portal. Grievances filed through the CM Window have a resolution period of 30 days. Details related to complaints received through the CM Window up till 12.8.2024 are given in Table 3.

Table 3. Complaints Received through the CM Window

Total Complaints Received	Total Complaints Resolved	Complaints Resolved in Time	Total Complaints under the Process but Overdue
1,304,432	1,197,770	354,482	94,791

36. The SPV will set up a Grievance Redressal mechanism, which will ultimately be linked to the Decision Support System. The GRM mechanism will include a charter and responsibility matrix as well as indicate when it needs to be functional. It will also include the alert and escalation mechanisms, the various mediums for users to access it and the benchmarks for measuring its efficiency. The Haryana Pollution Control Board also receives grievances on air quality management through emails, letters, and the Sameer App (handled by the CPCB) which are sent to the regional offices for timely resolution. This was assessed by the Bank, and the following was found (i) Grievances are not accepted over the telephone (ii) The department also has a vigilance officer provided by the government to handle departmental complaints (iii) CPCB has issued a notification under the Haryana Right to Service Act, 2014, wherein it notifies certain services and the time limit within which these are to be provided to the citizens. It has designated officials for grievance redressal as per the Act.

37. The implementing departments, that is, Transport, Agriculture, Urban, and Industries have constituted an Internal Complaints Committee (ICC) as per the requirement of the Sexual Harassment of Women at Workplace (Prevention, Prohibition, and Redressal)—POSH[4] Act, 2013. No training of staff and ICC members has been carried out till date nor have the committees of respective departments been reconstituted (after every two years) as per the act. The SPV also needs to ensure that there is a functional ICC to play a preventive and redressal role related to sexual harassment at workplace.

38. **Stakeholder engagement.** From the selected implementing agencies assessed, it was found that there are limited forums and channels within the implementing departments that allow for public participation and involvement in the decision-making process. In the DoEFCC, most public interactions undertaken are for awareness building. Periodic meetings are held with industrial associations on compliance requirements. The HSPCB, as the environment regulator also conducts awareness programs with farmers and farmer groups on crop residue burning issues and conducts sensitization programs with schools (eco clubs), colleges and universities, and hospitals on biomedical waste. An Annual Action Plan is developed for the awareness programs. The HSPCB has also sought support of nongovernmental organizations such as the Haryana Hazardous Management Society in creating public awareness.

39. **Social inclusion.** In the agriculture sector, an incentive of INR 1,000/ per acre and 70 percent agriculture machinery is provided by the department to small and marginal farmers for crop residue management. In 2023–24, 11,129 small and marginal farmers (10,452 male; 677 female) received receiving subsidies for agri-machinery and storage warehouses and financial incentives for reducing crop burning. Similarly, the DoT has made provisions for seat reservation in buses for disabled persons, students, and women. Also, pink buses have been deployed for women and girls. Additionally, behavioral change trainings for depot-in-charge and drivers were conducted by certified training institutions to ensure women's safety. The SPV, has a proposed staff strength of 50, mostly employed on a contractual basis. The hiring policies that are being proposed by the SPV will be designed to attract and retain female workers in line with global best practices.

40. **Management of Workers.** The ARJUN SPV will serve as the nodal implementing agency under the Program. The Air Quality Management Project Management Unit (AQM-PMU), housed within the SPV and responsible for day-to-day implementation, is expected to engage technical staff through deputation from state departments as well as on a contractual basis, including post-retirement hires and open market recruitment. While staff on deputation will continue to be governed by existing Government of Haryana service rules, the SPV will draft its own recruitment and human resource policy for contractual hires. This policy will align with applicable legal and regulatory frameworks and incorporate provisions related to fair wages, leave entitlements, grievance redressal, and maternity benefits in accordance with relevant laws.

41. While the Program will not entail large-scale construction, moderate-scale works will be undertaken for upgrade of the state air lab, regional labs, road rehabilitation, greening initiatives, EV charging facilities, and ATSs across the state. This will involve engagement of workers for construction and installation activities. There are adequate legal safeguards at the national and state level to ensure safe and fair working conditions for workers. The state has a Building and Other Construction Workers (BoCW) Welfare Board and HKRNL that looks after the welfare of workers and links them to relevant schemes and entitlements—including maternity and child benefit, access to loans, pension, health assistance, and insurance and disaster relief. The SPV and other implementing agencies will need to ensure that labor requirements and contractor's responsibilities related to terms of work, health and

[4] POSH = Prevention of Sexual Harassment.

safety, compliance with labor laws, prevention of forced or child labor, workers' code of conduct, prevention of gender-based violence and SEA/SH risks at worksites, and presence of a grievance redress mechanism (GRM) for workers are clearly spelled out in their works requests to executing agencies. They will also need to undertake due diligence to ensure that such responsibilities are outlined in the bid documents and contracts.

42. India has a growing supply chain around clean energy and solar solutions, which aims to improve self-sufficiency and reduce dependence on exports. The GoI has recently entered a partnership for Resilient and Inclusive Supply Chain Enhancement (RISE)[5] to strengthen and diversify the supply chain for clean energy products and incentivize production of solar and wind power equipment. This is in addition to the Product-Linked Incentive Scheme which supports similar products. However, in light of the recent concerns regarding the usage of forced labor in the manufacture of solar panels and in line with India's legislation on Bonded Labor System (Abolition) Act, 1976, and Article 23 of the Indian Constitution prohibiting human trafficking and similar forms of forced labor, the SPV and other implementing agencies would require its contractors and suppliers to prohibit use of forced labor in the supply of solar cookers. It will also need to include in its contracts the requirements that their solar panel suppliers neither have nor will engage or employ forced labor.

D. ASSESSMENT OF CORE PRINCIPLES

CORE PRINCIPLE 1 - ENVIRONMENTAL AND SOCIAL MANAGEMENT

Program environmental and social management systems are designed to (a) avoid, minimize, or mitigate adverse impacts; (b) promote environmental and social sustainability in the program design; and (c) promote informed decision-making relating to a program's environmental and social effects.

Summary findings: Consistent

43. Environmental risk management in the country is regulated through Environment (Protection) Act, 1986; Construction and Demolition Waste Management Rules, 2016; Municipal Solid Waste Management Rule, 2016; E-Waste Management Rules, 2016; Hazardous Management Rules, 2016; and Boiler Act, 1923, which are comprehensive to cover air, water, waste management, and worker and public safety. The Forest (Conservation) Act, 1980; the Wildlife Protection Act, 1972; and the National Green Tribunal (NGT) Act, 2010, empowers the government to take measures for protecting and improving the environment. The legal framework is robust enough for controlling pollution and conserving natural resources. It empowers the central and state PCBs to take necessary measures to improve air and water quality, regulate emissions from industries, and enforce emission standards. These laws are mostly aligned with good international practice and require avoiding, minimizing, and mitigating adverse environmental impacts of the proposed interventions as well as compensating for the residual impacts.

44. While the environment regulatory framework (laws and regulations)—environmental, forests—and pollution control acts and rules were found to be adequate to manage the environmental effects of the Program activities, most activities under the project have low and moderate environmental effects; hence, they do not require an EIA. However, the existing environment-specific capacity-building programs are found to be need based and insufficient while the nodal environmental officers are expected to ensure compliance with required environmental standards. This gap is to be addressed through planned capacity enhancement/training programs. Gaps exist in E&S risk

[5] RISE partnership is an initiative of World Bank and G-7 for enhanced collaboration on diversification of supply chain for clean energy products and tackling climate change.

screening, enforcement mechanisms, and awareness generation to public leading to noncompliance. Well-planned awareness campaigns under the Program will help in increasing the awareness. The national and state governments have well-developed environment legislations. However, the implementation setup to address environmental challenges needs to be further strengthened with support of PMU environment specialist.

45. The national and state policy framework is largely adequate to manage social risks emerging from the project investments. Under the operation, the SPV will conduct public awareness and education on AQM. A centralized grievance portal Window was also found to be effective in addressing citizen's grievances in a time-bound manner. Capacity of the SPV and participating institutions on citizen engagement, gender, social inclusion, land management, OHS, and CHS is insufficient and needs to be improved through hand holding, orientations, trainings, refreshers and monitoring mechanisms.

Key Gaps and Recommendations

- Noncompliance exists in the state about the environmental permits, safe disposal of electronic and hazardous wastes, and monitoring and enforcement by the authorities due to shortage of human resources. There is a need to strengthen the HSPCB performance on compliances, strict enforcement, and monitoring mechanisms.
- No dedicated training plan is in place and the trainings are organized based on need. The absence of regular trainings, resulting gaps in capacities (on state-of-the-art technologies), may affect integration of better-quality mitigations/measures. The SPV should plan for regular trainings on better technologies and practices.
- There is no mechanism for environment or social screening conducted on detailed project reports and other feasibility studies for early determination of impacts and alternative analysis. There is a need to introduce the system of screening for risk identification and developing and implementing mitigation plans.
- There are risks of small-marginal farmers and female entrepreneurs, including transport users and women belonging to vulnerable communities, being excluded from access to Program benefits.
- No systems are in place for tracking and evidence-based reporting on citizen engagement, grievance management (except the CM Window), and IEC and BCC activities and its outcomes.

CORE PRINCIPLE 2 - NATURAL HABITATS AND PHYSICAL CULTURAL RESOURCES

Program environmental and social management systems are designed to avoid, minimize, and mitigate adverse impacts on natural habitats and physical cultural resources resulting from the program. Program activities that involve the significant conversion or degradation of critical natural habitats or critical physical cultural heritage are not eligible for PforR financing.

Summary findings: Consistent

46. The Program activities do not include environmental effects on natural habitats or cultural heritage sites. Clearly, no significant conversion or degradation of critical natural habitats or physical cultural heritage is envisaged. National laws such as the Forest Conservation Act, 1980, regulates the diversion of forest land for non-forest purposes and the Wildlife Protection Act, 1972, provides for protection of plant and animal species. The Ancient Monuments and Archaeological Sites and Remains Act (or AMASR Act) provides for the preservation of ancient and historical monuments and archaeological sites and remains of national importance. In the unlikely case of any such

environmental effects, the respective departments were found to be competent in addressing the regulatory requirements. The consistency to this principle was confirmed.

Key Gaps and Recommendations

- As part of the ESSA recommendations, an E&S screening checklist should be developed and utilized in investment planning where any civil works is involved to ensure no direct, indirect, or residual risks to the environment and sensitive receptors. In addition to strengthen the implementation E&S Code of Practice should be developed for SoPs and integrated into trainings.

CORE PRINCIPLE 3 - PUBLIC AND WORKER SAFETY

Program procedures ensure adequate measures to protect public and worker safety against the potential risks associated with (a) the construction and/or operation of facilities or other operational practices under the program; (b) exposure to toxic chemicals, hazardous wastes, and otherwise dangerous materials under the program; and (c) reconstruction or rehabilitation of infrastructure located in areas prone to natural hazards.

Summary findings: Consistent

47. India has established a comprehensive management and supervision system for worker safety. This system ensures the screening of safety issues and occupation hazards and assessment of worker safety and hazard during operations, design, and construction. This is a government organizational setup with the HSPCB to manage the environment and occupational health and work safety management and supervision with established laws, regulations, procedures, and enforcement arrangement. All the OHS risks identified under the Program are covered under these regulations and policies.

48. These acts provide for better safety, health, and welfare of workers in factories, including provisions for cleanliness, ventilation, lighting, and drinking water. They require factories and worksites to take measures to prevent accidents and ensure the use of safety devices and protective equipment. Other attributes relevant in the policies include (a) limits on working hours, overtime, and child labor; (b) the appointment of safety officers and constitution of safety committees; and (c) inspection and enforcement of safety standards by factory inspectors. While the systems are in place, the enforcement needs to be strengthened by the departments as well as the PCB. For civil work, worker and public safety are generally managed through provisions in the bid/contract documents with contractors and will be further strengthened through SOPs for construction waste management and road rehabilitation. In addition to strengthening the implementation of SoPs, E&S Code of Practice should be developed for SoPs and integrated into trainings.

49. As all contractual staff are hired through HKRNL, the Deployment of Contractual Persons Policy 2022 will be applicable—which clearly specifies the terms, conditions of engagement, emoluments, benefits, and leave entitlements.

50. There are concerns related to the environment and human health and safety in the recovery and recycling of hazardous waste materials (batteries and auto parts) and their transport to landfills. The scrappage facilities are required to be registered with the PCB which are regularly monitored by the PCB for their adherence to SOPs on worker safety and safe disposals.

Key Gaps and Recommendations

- Encourage use of registered recycling which follows EHS standards and ensure recovery and recycling of wastes takes place in an environmentally sound manner.
- OHS management in the construction of ATSs, charging stations, C&D waste processing, and boilers require regular monitoring by PCBs (as per their mandate) and need-based trainings are to be organized on safety measures in industries.
- Given that the OHS and CHS risks related to different sectors are identified by the assessment, the SPV must regularly monitor compliance with the existing laws, policies, and safe practices to mitigate any risks to the project workers and the adjacent communities.
- While most employment-related benefits and emoluments are applicable to contracted workers, the HKRNL policy does not address workers' health and safety and women security against SEA/SH risks. it is recommended that the SPV adopt a workers' code of conduct to ensure OHS, including prevention and protection against SEA/SH of all permanent and contracted staff. The POSH Act is otherwise applicable to all employees, including contracted workers. Additionally, bid documents for civil works need to clearly spell out contractor's obligations related to prohibiting forced and bonded labor, including adoption of workers' code of conduct to ensure safety against SEA/SH risks. SOPs for managing construction waste in road rehabilitation will also include aspects related to OHS and safety in general. E&S Code of Practice could strengthen these aspects for SOPs.

CORE PRINCIPLE 4 - LAND ACQUISITION

System and capacity assessment: Avoid or minimize land acquisition and related adverse impacts. Avoid or minimize displacement and assist the affected people in improving, or at the minimum restoring, their livelihoods and living standards.

Summary findings: Consistent

51. All program-related physical interventions are planned to be undertaken on existing lands, land pools, or within the premises of existing government offices and institutions. Land for centers, labs, EV charging facilities, greening initiatives, and so on will be provided by the respective local bodies or development authorities from their existing land pools, and no land acquisition is foreseen.

Key Gaps and Recommendations

- For all physical investments, an E&S screening will be undertaken by the concerned IAs to ensure that for all infrastructure development leading to land acquisition or displacement, forced eviction is screened out.

CORE PRINCIPLE 5 - INDIGENOUS PEOPLES AND VULNERABLE GROUPS

System and capacity assessment. Give due consideration to the cultural appropriateness of, and equitable access to, program benefits, giving special attention to the rights and interests of indigenous peoples/Sub-Saharan African historically underserved traditional local communities and to the needs or concerns of vulnerable groups.

Summary findings: Consistent

2. There is no scheduled tribe (ST) in Haryana. As per the 2011 Census (2021), the SC population of Haryana was 4.091 lakhs, comprising 19.35 percent of the state's population.[6] The program will have a statewide footprint with select works focused on Faridabad and Gurgaon, including clusters located across the state.

Key Gaps and Recommendations (to improve social inclusion for other vulnerable groups)

- The Program must ensure that beneficiary selection under the domestic/residential, MSME, agriculture, and transport sectors is inclusive and there are specific social criteria in place for targeting vulnerable communities, particularly women-headed and below poverty line (BPL) households—as beneficiary households/entrepreneurs.
- To secure higher engagement of women and their collectives, the program will (a) establish women-led enterprises; (b) support these enterprises to access microfinance for working capital; (c) provide technical assistance and trainings to recycle farm waste into bio-fuel pellets, biogas, compost, slab sheets, and paper; (d) provide business development and entrepreneurship trainings, including skills development on bookkeeping, accounting, and financial training; (e) gender sensitization trainings to men and women; and (f) develop a communications and marketing strategy for female last-mile agents and entrepreneurs. The effectiveness of these interventions will be measured through two indicators focusing on hiring of women in the transport sector and women's enterprises access to formal credit.
- Beneficiary participation and stakeholder consultation (particularly from vulnerable communities) is needed during value chain development for crop residue and C&D waste.
- Transport infrastructure does not usually consider gendered needs of women. To address this, the Program will (a) mandate the hiring of women as drivers, conductors, and operations and maintenance staff as a percentage of overall staff for e-buses; (b) provide gender-sensitive infrastructure at bus depots including toilets and changing and feeding rooms; (c) conduct stand-alone trainings for women and equip them with the skills to become drivers, conductors, and operations and maintenance staff in partnership with Haryana government's DoT; and (d) build an enabling environment by conducting gender sensitization and mainstreaming trainings for DoT staff and operators.

CORE PRINCIPLE 6 - SOCIAL CONFLICT

System and capacity assessment: Avoid exacerbating social conflict, especially in fragile states, post-conflict areas, or areas subject to territorial disputes.

Summary findings: Consistent

52. The Program footprint does not include any areas that are considered fragile or disputed. The nature of Program investments is such that they are not likely to lead to or exacerbate social or resource conflicts.

[6] Maximum SC population was recorded in Fatehabad District (30.2 percent), followed by Sirsa (29.9 percent), and Ambala (26.3 percent). Minimum share of SC population was reported in Mewat (6.9 percent), Faridabad (12.4 percent), and Gurgaon (13.1 percent).

IV CONSULTATION AND DISCLOSURE OF DRAFT ESSA

A. SUMMARY OF DISCUSSIONS AND MULTI STAKEHOLDER CONSULTATION WORKSHOP

53. To develop a better understanding of implementation practices, procedures, standards, and the approach for this Program, in the period from February to August 2024, the World Bank team carried out site visits, meetings, and workshops with various stakeholders, including technical staff in Departments (DoEFCC, DoA, Department of Rural Development [DoRD], Directorate of Urban Local Bodies (DoULB), DoT, PwD, and DoI), private sector (C&D processing unit, scrapping facility, biogas plants, livestock shelter, aggregators, industries, and so on), independent experts and institutes (The Energy and Resources Institute [TERI], Automotive Research Association of India [ARAI], National Environmental Engineering Research Institute [NEERI], and so on), nongovernmental organizations/civil society organizations, and beneficiaries. These initial stakeholder consultation meetings informed key ESSA findings, contributed to formulating the ESSA PAP, and affected the design of the Program. A summary of the consultations is included in Annex 3.

B. DISCLOSURE

54. A state-level consultation workshop was organized before appraisal. Before the workshop, the draft ESSA report was disclosed by Government of Haryana (GoH) for receiving feedback from government officials, beneficiaries, and other relevant stakeholders. The key inputs received during the consultation workshops are included in Table 4. The final Environmental and Social Systems Assessment (ESSA) has been updated to reflect the approved program design and input received during the decision meeting. It has been re-disclosed, with an executive summary translated into Hindi, on the Government of Haryana website (https://www.hartron.org.in/public-disclosure/).

Table 4. Key Inputs from Stakeholder Consultation on E&S Management

Sector	Suggestions and Good Practices from Participating Stakeholders	How the Program Design Can Addresses These
Environment - DOEFCC	PCB is committed to addressing the issues identified in ESSA (dust, noise and waste management) as this is part of the PCB's mandate.	The regular (half yearly) monitoring under the program will help in achieving this.
Transport	The need for Non-motorized Infrastructure (NMI) is of utmost importance for pedestrian safety which calls for the role of Municipal Corporations. Issues like dust and noise pollution, road safety, and the impacts on vendors need consideration.	State level public transport plans should consider inclusive design aspects. The activities are to be done in a consultative manner to ensure transparency, participation and inclusion.

V RECOMMENDATIONS AND ACTIONS: INPUTS TO THE PAP AND IMPLEMENTATION SUPPORT PLAN

A. HIGHLIGHTS: FINDINGS AND RECOMMENDATIONS

55. Overall, the E&S effects of the Program are expected to be positive in terms of improved livability, public health, and strengthened capacity for AQM. India has made significant efforts to improve the functioning of its E&S risk management systems in recent years The ESSA concludes that the Program has a moderate E&S risk. Based on the assessment of the E&S management system applicable to the proposed Program, it is concluded that there is an existing policy and legal framework to mitigate environment, social, and occupational health and safety risks. However, institutional setup on E&S management, due diligence, and capacity systems to address the ESHS require strengthening. There remain certain gaps from the perspective of actual implementation of such systems identified through this ESSA, based on which the following recommendations are proposed to PAP and the Results Framework.

Environmental Gaps

Gaps in Institutional Capacity

- The SPV is a new entity and integrally connected with the sectoral departments through the project implementation structure. However, Environmental expertise from the SPV needs to be intrinsically connected with implementation activities of the departments. The environment specialist who will be placed in the PMU will need to bridge the gap between the sectors and will ensure seamless integration, monitoring, and reporting of environmental aspects into the program interventions.
- Environmental effects are generally managed within the functions at the various levels of the sector departments. Overall, in terms of environmental performance, the departments (Agriculture, Industries, Transport, and Urban) are clearly committed to promote environmentally responsible practices. The implementing departments/agencies can mainstream environment and occupational health and safety monitoring and training of the program activities and that will contribute to organizational strengthening. This will be supported by ARJUN, a special purpose vehicle under the Finance Department. Implementation will be carried out by a Program Management Unit (PMU) for AQM in ARJUN and Implementing Agencies. The PMU will include full-time technical staff for environmental and social (E&S) risk management and other E&S functions in the PMU. Dissemination of good practices relevant to the sectors through capacity-building programs and hand-holding support is planned.

Gaps in Due Diligence

- There is no mechanism for environment screening conducted on detailed project reports and other feasibility studies for early determination of impacts and alternative analysis. An environmental screening checklist including Environmental and Social Code of Practice should be developed and utilized for screening the DPRs, proposals, activity plans, and so on, to ensure no direct, indirect, or residual risks to the environment and sensitive receptors.
- The mandatory enforcement of the legal requirements/environmental compliances suffers due to inadequate human resources and shortage of funds with the department. Measures need to be taken toward raising awareness among the stakeholders on compliances, imposing stringent measures, providing incentives, and monitoring and reporting of the

status. For civil works, to strengthen the implementation, Environmental and Social Code of Practice should be integrated into trainings, procurement packages and develop to support SoPs in longer term.

- The Program also incentivizes transitioning to EVs. The SPV, with support from the HSPCB needs to monitor the processes for EHS compliances involved in battery replacements and disposals.

Gaps in Training and Capacity

- There is no institutional plan for regular capacity building programs for the departmental staff (PCB). The staff can benefit from trainings on state-of-the-art technologies/solutions to the environmental concerns especially in hazardous waste management. Planned trainings, exposure visits, and so on can help in addressing the issues faster and better. Earmarking of funds is important for the same. The E&S Code of Practice, screening instruments and SOPs will help capacity building and focus on capacity for managing E&S risks.

Social Gaps

Gaps in Institutional Capacity

- The social risk assessment and management capacities within the selected implementing agencies assessed are weak owing to their largely technical mandates. The SPV capacities will need to be augmented by placing a social development specialist within the AQM PMU who will also be responsible for hand-holding and guiding other departments in managing social risks related to land, workers and community health and safety, grievance management, and ensuring engagement and inclusion in sector interventions.

Gaps in Due Diligence

- There are no screening mechanisms in place within the selected implementing agencies assessed to screen interventions and sites for possible social impacts. The operation will adopt a risk screening approach, where all physical investments will need to be preceded by a robust social risk screening.
- The Program does not entail land acquisition and is not expected to lead to physical displacement, as physical sites/locations will be identified from within existing government lands. However, since these locations are unknown at this stage, there is possibility of some of these lands not being unencumbered. Thus, screening is necessitated to ensure that land for any physical investment under the Program is encumbrance-free and does not result in involuntary resettlement.

Gaps in Policy and Incentives

- The capacities of some institutions for facilitating community and stakeholder participation are currently weak. The World Bank identified gaps related to stakeholder participation in the decision-making process on AQM, streamlining of departments' grievance mechanisms, and knowledge-sharing process. Large-scale IEC and BCC campaign has been envisaged under the program for transition to clean cooking, mandatory fitness for vehicles after their critical age, and on agriculture-based emissions. Further, value chain development and market links for crop residue and C&D waste require critical inputs and decision-making from beneficiaries and stakeholders. Thus, the Program has proposed development and implementation of a Citizen and Stakeholder Engagement Plan for a structured stakeholder

engagement to mobilize support and awareness and accelerate innovations. Indicators have been integrated in the Program's Results Framework to measure its outcome.

- Current procedures of most implementing institutions do not sufficiently address the needs of vulnerable and marginalized social groups. Within the transport sector, there is a need to integrate gender-inclusive designs in transport infrastructure (depot, EV facilities, ATS, and three-wheeler stands) and ensure women's safety, to increase their mobility and participation in economic opportunities. Periodic women's safety audits of the built environment (depot, EV facilities, ATS, and three-wheeler stands) need to be carried out to identify the key gaps and develop evidence-based actions that can be integrated during the design, construction, and operation phase.

Gaps in Training and Capacity

- Further, there is a need to augment capacities in the beneficiary selection process for interventions such as entrepreneurship program and value chain development for crop residue (briquette, pellet, biofuels, and pulp and paper products) to ensure transparency and inclusion.

B. PROGRAM EXCLUSIONS

56. The following high-risk activities will be excluded from support under the proposed PforR Program expenditure:

- Establishment of vehicle scrapping facility
- Major/large-scale centralized industrial boiler plants/systems
- New landfill/ dumpsites
- Any EVs using lead acid batteries
- Construction of new buildings or any construction beyond the existing footprint
- Work on any structures which contain asbestos materials (AC roofing sheets, AC pipes, and so on)
- Any activity involving private land acquisition
- Any activity that may require involuntary resettlement and forced eviction.

57. **Associated facilities/activities.** E&S risk identification, exclusion, screening, and ranking have been conducted for the activities/facilities associated with the proposed activities that are to be included in the PforR. Some proposed activities (such as vehicle scrapping facilities and C&D waste management plants) have been excluded from the PforR scope because the associated activities would have potential high E&S risks/impacts.

C. RECOMMENDATIONS TO BE INCLUDED IN THE PAP

58. The assessment identified certain areas for improvement of the implementation of the E&S systems, which can be addressed through the following recommendations:

Table 5. Recommended E&S Actions for PAP

S. No.	Description	Timeline	By	Indicator for Completion
1.	Develop procedures / E&S checklist including Code of Practice to identify, manage, and monitor E&S risks and impacts of TA, construction works, greening activities, and transport infrastructure supported under the PforR. *E&S Code of practice consists of good construction practices stemming from national regulation and legislation.*	Checklist including E&S Code of Practice developed within six months of effectiveness and then administered every six months	ARJUN-SPV	Year 1: E&S screening checklist including Code or Practice, monitoring tool developed and adopted for rehabilitation of roads, and greening and transport interventions under the PforR Include relevant section of checklists in Procurement Packages Year 2 onwards: Checklist reviewed every six months
2.	Undertake periodic women safety audit of transport infrastructure supported under the PforR	Safety audit tool developed within six months of effectiveness and then administered every six months	PMU (ARJUN-SPV) in cooperation with DoT	Year 2: Women safety audit tool developed and piloted Year 2: Rolled out in depots, EV charging stations, three-wheeler stands, and automated testing station (ATS) Year 3 onwards: Women safety audit conducted every six months and report published annually, (ensure findings of previous report addressed in subsequent year).
3.	Develop E&S risk management skills	Plan, conduct, document regular E&S trainings	ARJUN-SPV	Year 1: Training needs assessment, module development, training calendar development for the entire project cycle Annually Recurring: Evidence of training conducted, and number of persons trained (topic wise, agency wise and gender disaggregated)

Table 6. Recommendations Integrated in the Results Framework

Intermediate Indicators for Results Area
• Increase in partnerships for collaboration with stakeholders and private sector (on awareness and behavior change campaigns, events, and consultations) • Accessible and effective grievance redressal for citizens and stakeholders • People benefiting from improved access to sustainable transport infrastructure and services (disaggregated by youth and women) • Women employed as technical and operational staff in city bus transport services

To further strengthen the PAP implementation and overall environmental and social performance several segments have been embedded in DLIs and respective verification protocols.

Protocols Integrated into the DLI verification:
DLI6: Verification Protocol for Hazardous Waste Management: The DLI verification protocol encompasses compliance checks related to hazardous waste management. The independent verification of DLI6 will focus on confirming the decommissioning and dismantling of old DG sets and boilers at registered recycling facilities in a proper manner.

Table 7. Recommended E&S Actions for POM

Action	By	Timeline	Description of Activity
Adopt criteria to ensure social inclusion in selection of beneficiaries under the PforR Program	SPV	Within six months of effectiveness and maintain throughout implementation	Key social parameters determined, verification of adoption of criteria, and number of persons selected (disaggregated by gender and socioeconomic status)
Include standard E&S clauses in all construction contracts	SPV	Within 9 months of the effectiveness date	Inclusion of E&S standard clauses in contracts will be linked to environment permits/ consents and E&S Code of Practice
Selection and inclusion of energy/fuel-efficient devices and applicances for all offices and Program-supported infrastructure	SPV	Upgrade of labs, machinery for crop residue management and so on.	Bid documents to include clauses on adoption of new energy efficinet devices in new offices, and contracts
Ensure universally inclusive and gender-responsive design considerations are embedded in depot, EV facilities, ATS, three-wheeler stands, and buses and depots	SPV	DPR preparation	Appropriate requirements (as per law and based on the findings of safety audit) embedded in the DPRs
Stakeholder mapping and engagement integrated in value chain development	SPV	ToR preparation Year 1	Stakeholder mapping and engagement process included in the consultants' terms of reference Citizen and Stakeholder Engagement Plan prepared
Functional grievance mechanisms established to ensure two-way communication	SPV	Year 1	Digital GRM design document finalized and developed
Adoption of Workers' Code of Conduct and implementation of POSH Act, 2013 to ensure women safety	SPV	Within 12 months of the effectiveness date	Develop and display workers' code of conduct, provide basic orientation of POSH Act, 2013, and process of redressal to both permanent and contractual staff.
Develop and Implement Environmental and Social Code of Practice for construction work	SPV	Within six months of effectiveness and maintain throughout implementation	Develop and implement Environmental and Social Code of Practice for construction work based on national legislation and good international practice. Include in trainings.

Table 8. Implementation Support by the World Bank

The support by the World Bank during implementation of the Program will include the following:

1. Reviewing implementation progress and achievement of Program results on E&S risk management, including PAP and relevant DLIs, through the periodic IVA reports, implementation support missions, and any other E&S progress reports submitted by the PMU
2. Assisting SPV and the IAs in setting up systems and procedures to identify, manage, and monitor E&S risks/impacts
3. Supporting institutional capacity building on E&S management on a periodic basis
4. Monitoring the performance of Program systems, including the implementation of agreed E&S systems strengthening measures as included in the PAP
5. Monitoring changes in Program risks related to E&S as well as compliance with the provisions of the legal covenants
6. In collaboration with the borrower, adapting E&S risk management practices in a manner consistent with PforR principles as necessary to improve Program implementation or to respond to unanticipated implementation challenges.

SUPPORTING ANNEXURES AND REFERENCE DOCUMENTS

ANNEX 1: LIST OF DOCUMENTS REVIEWED

1. ARJUN SPV Approvals and draft policies
2. National Clean Air Program (NCAP)
3. XV-FC Technical and Operational Guidelines
4. National Ambient Air Quality Standards (NAAQS)
5. National Biomass Cookstoves Initiative (NBCI)
6. Haryana EV Policy 2022
7. Haryana Bio-Energy Policy
8. Annual Reports of HSPCB
9. Annual Reports of Department of Agriculture
10. Environmental Acts, Rules
11. Haryana Land Pooling Policy
12. National Biogas and Manure Management Programme (NBMMP)
13. State Rural Livelihoods Mission
14. Swachh Bharat (Rural)
15. Swachh Bharat Mission
16. Finance Commission Solid Waste Management Grants
17. Pradhan Mantri Ujjwala Yojana (PMUY)
18. Saubhagya Scheme or Pradhan Mantri Sahaj Bijli Har Ghar Yojana
19. National Policy for Management of Crop Residues (NPMCR)
20. National SO_2 and NO_x Emission Standard Norms by MoEFCC
21. MoEFCC Notification on Brick Kilns 2018
22. Motor Vehicles Act 1988
23. Voluntary Vehicle Fleet Modernization Program (V-VMP) and Vehicle Scrappage Policy
24. Bharat Stage Emission Standards
25. MSME Sustainable (ZED) Certification
26. Entrepreneurship Skill Development Programme (ESDP)
27. Plastic Waste Management Rules, 2016 - Amendment 2022
28. Swachh Bharat Mission - Urban and Rural
29. New Emission Standards for Power Plants under Environment Protection Act 1986
30. Galvanizing Organic Bio-Agro Resources Dhan (Gobardhan) Scheme
31. Sustainable Alternative Towards Affordable Transportation (SATAT) Scheme
32. National Food Security Mission
33. Paramparagat Krishi Vikas Yojana (PKVY)
34. Rashtriya Krishi Vikas Yojana (RKVY)
35. National Project on Organic Farming (NPOF)
36. Pradhan Mantri Krishi Sinchai Yojana (PMKSY)
37. Biogas Development and Utilization Program
38. National Mission for Sustainable Agriculture (NMSA)
39. Agricultural Technology Management Agency (ATMA) Scheme

ANNEX 2: QUESTIONNAIRE FOR PRIMARY DATA COLLECTION FROM ALL IMPLEMENTING AGENCIES

- Is there experience of working on World Bank operations?
- How are environmental risks (pollutions, waste management, occupational safety, community health and safety) being currently managed within your institution/department (policy, systems, human resource)?
- How are social risks (resettlement, exclusion, gender, citizen engagement) being currently managed within institution/department (policy, systems, human resource)?
- Are there any initiatives undertaken by your department to mitigate adverse impacts on environment(agriculture - fertilizer use, livestock - methane emissions, transport - vehicular emissions, PCB - solid, and C&D waste management, R&D - to promote clean energy, and so on)?
- Are there any programs, or schemes being implemented in your department to generate/enhance community awareness on pollution (noise, air, water), waste management, and promote energy efficiency, use of renewable energy, use of clean energy, and so on?
- Are any special measures adopted in schemes implemented by your institution to ensure inclusion and participation of members from vulnerable communities (tribal, SC, BPL households, single women, and members of women-headed households)?
- Does the organization have an HR policy? (please share)
- How many staff are there? Please share male and female breakup.
- Does the organization also hire consultants and specialists? Please share any recent sample of contract (emoluments/ compensation, work hours, benefits, leave, and so on)
- How many non-staff/ad hoc contracted workers are there? Please share male and female breakup.
- Specific for each department. What are the criteria for targeting and selection of entrepreneurs/ beneficiary (households for cookstoves, truck/bus owners, MSME clusters and industrial units, individual brick kilns and clusters, agri and dairy producers—over and above the technical criteria spelt in the DPRs and PAD? (for example, vulnerability/scheme convergence/other schemes access eligibility).
- Does the organization's mandate require interacting with communities/citizens? If yes, is there an existing stakeholder engagement, outreach or IEC strategy/behavior change plan and capacities?
- What has been the experience/challenge/achievements of engaging with citizens/stakeholders particularly on behavior change for reducing air pollution? Have you done any assessment on impact of your IEC strategy?
- What kind of channels/mediums are available for registering grievances within your institution?
- Please briefly describe and share the total number of grievances received and redressed for last six months.
- How is general awareness created about the presence and procedures for grievance?
- Is there also a statewide GRM that covers all departmental programs/ schemes (for example, CM Helpline, State Public Grievance Redress Cell)? Please share the number of grievances (related to your institution) received and redressed through this channel.
- Does the organization have an Internal Complaints Committee (ICC), in compliance with the

Prevention of Sexual Harassment at Workplace (POSH) Act? Are employees aware about the committee, its functions and procedures? Please share the number of POSH-related grievances received and redressed in the past two/five years.

- Specific to PCB: How will land-related requirements be met by the department under this program? What will be the standard procedures for monitoring (debris/muck/waste) disposal, occupational health and safety, community health and safety, and labor law compliances civil works?
- Are there any challenges faced in the enforcement of rules and regulations pertaining to pollution, waste management, and so on?

ANNEX 3: DETAILS OF MEETINGS AND CONSULTATIONS HELD

Stakeholders	Key Discussion Points
ARJUN, SPV (July 17-18, 2025)	Agreement on PAPs, ESCP, disclosures and preparation of LMP.
Gurugram (July 15, 2025)	Site visit to C&D waste disposal and Gurugram Bus Depot and interaction with street cleaning service providers: • Current volume and projections, concerns and challenges • Preparation for electric vehicle transition • HR policies • OHS
HSPCB, July 8, 2024	Discussions were held on the following: • Compliance management and tracking of units that have not obtained compliances and are operating without consent. • Consent management and monitoring of industries and handling violations. • Capacity-building programs for staff. • IEC activities with target groups such as industries, farmers and farmer groups, schools, colleges and universities, and hospitals. • Use of CM Window for GRM and other channels for filing complaints. • Need/potential for training to the staff on state-of-the-art technologies, monitoring, good practices, and so on, on a regular basis. • Waste management and challenges faced due to involvement of private/registered recyclers in C&D waste, plastic waste, and so on. Regular training is needed for recyclers as well on good practices, standard norms, and so on.
State Transport Department, July 8, 2024	Discussions were held on the following: • E-vehicles policy, waste management - effluent treatment plants (ETPs) and sewage treatment plants (STPs) • Land availability for Depot Construction • Use of the CM Window and other portals for grievance redressal such as Social Media Grievance Tracker (SMGT) • Inclusion and safety in depot infrastructure and bus amenities for commuters particularly for women and persons with disabilities.
Department of Agriculture, July 9, 2024	Discussions were held on the following: • Awareness generation and subsidies (on implements/machinery) and incentives to farmers for not burning the residue • IEC activities that are intensified during the peak season—June and July—particularly in red, yellow, and green zones • Challenges related to decomposition of crops and crop diversification. • Grievance management through post, email, and through field officers, including the CM Window.
Multiple departments - July 9, 2024	Discussions were held on the following: • Departmental meetings, participation, and coordination are key for the success of the program. • Issues with livestock manure management in urban and rural areas. • Management of C&D waste and legacy waste (solid waste collected in landfills)
Department of Rural Development (DoRD), July 10, 2024	Discussions were held on the following: • Implementation of community biogas plants and schemes supporting such initiatives, including the use of the biproduct (fuel efficiency, capacity, and so on) • Operation and management of such schemes at the village level and the need for SOPs

	• Land availability and selection process of areas for scheme implementation • Awareness generation and mechanism for grievance redressal at the field level.
DoULB, July 10, 2024	Discussions were held on the following: • Capacity of existing C&D waste management processing plants and the need for upgrade of existing plants and setting up new plants. • Need for increasing demand for processed wastes/recycled products. • Transportation of construction materials and need for strict regulations and enforcement to avoid dust pollution in urban areas. • Proper mechanism to manage earth filling and spillages. • Dairy waste is of serious concern in urban areas than rural areas and needs interventions. Biogas plants are required. • Refuse derived fuel (rDF) utilization is also a huge challenge. Demand fluctuates for rDF. • GRM is used for addressing public grievances.
Workshop February 1–2, 2024 (Chief Secretary, Additional Chief Secretaries, Heads of Department, and nodal officers from various departments and urban local bodies, and World Bank officials)	• Multisector, cross-regional approach: Need for comprehensive approach by involving multiple sectors—such as transport, C&D, industries, agriculture, solid waste management, household cooking, and road dust—to effectively address air pollution. • Build on existing policies and plan: Haryana already has in place several robust initiatives for AQM and a State Action Plan. Need for boosting these with sectoral interventions, strengthening institutional capacities, and filling any gaps. • Prioritizing sectoral interventions: Need to formulate and prioritize the interventions based on the contribution of each sector to air pollution. • Strengthen AQM monitoring and assessment and upgrade to cutting edge technology. • Help at hand in formulating workable plans, supplementing and strengthening knowledge, skills, human resource and institutional capacity, and systems, regulatory capacity and enforcement. • Incentives and enforcement to move to boilers using cleaner fuels. • Larger pipeline of investment and interventions is required, along with additional resources and pooling of resources. • Broader participation. IEC and outreach required to encourage citizen and private sector participation. • Climate co-benefits with intervention in sectors such as households, industry, and agriculture.
FGD- Agriculture Dept, HPGCL, Deloitte, NTPC, August 7, 2024	• Brief overview of challenges pertaining to crop residue management and livestock waste management in the sector, such as last-mile connectivity • Need for crop diversification and removal of hurdles in the market • Incentivization of aggregators, in addition to incentivizing farmers • Engaging with entrepreneurs to understand the challenges in the value chain
Site visits on July 12, 2024	The ESSA team has conducted due diligence field trips to some sample facilities listed below. E&S risks of these associated facilities/activities were verified to be managed under E&S policies and management systems of the GoI. 1. Construction and Demolition Waste Processing Plant, Basai, Gurugram 2. Reliance Bioenergy Plant (CBG), Jhajjar 3. ScrapeX, Orissa Steel Metaliks Pvt Ltd., Gurugram 4. Gaushala, Sukhdarshanpur. The due diligence investigation reveals that the general E&S risk ranking of the facilities/activities is moderate.
Final ESSA consultation November 11, 2024	**Purpose of the Consultation:** The purpose of the consultation workshop was to share the key findings and recommendations of the Environment and Social Systems Assessment (ESSA) undertaken by the World Bank and to solicit suggestions from the

	stakeholders (Departments, Industry Associations, consulting firms and NGOs). **Participants:** The participants included representation from the Department of Environment Forests and Climate Change (DoEFCC), Haryana State Pollution Control Board (HSPCB), Department of Transport (DoT), Directorate of Micro, Small and Medium Enterprises (DoMSME), Department of Agriculture (DoA), Municipal Corporation of Gurgaon (MCG), Department of Rural Development (DoRD), Deloitte, and Raahgiri Foundation, an NGO. The list of participants is included at the end. The World Bank (WB) team included – Ms. Sharlene J Chichgar (Task Team Leader - TTL), Ms. Philarisa Sarma Nongipur (Social Development Specialist, Consultant) and Ms. Vanitha Kommu (Environmental Specialist, Consultant). **Summary of Discussions:** <u>Introduction</u> • The meeting began with Ms. Sharlene, the TTL, WB welcoming the participants and providing a brief overview on the program's objective, components and the purpose of the consultation workshop. The World Bank's obligation to consult and involve the stakeholder was highlighted. • Mr. Pradeep Kumar provided opening remarks highlighting the time and efforts put in by various departments in preparation of the program and the need for the program in the state. <u>Presentation on ESSA</u> • Ms. Vanitha Kommu (WB) initiated the presentation highlighting the World Bank's commitment on environmental and social risk management in PforR programs, the core principles and the approach. She further explained the process and key aspects of the assessment. The key findings of the Environmental Systems Assessment and recommendations were explained in detail which included – exclusion of activities with adverse impacts, key risks, gap areas and recommendations. • Ms. Philarisa Sarma Nongipur (WB) presented the key findings of the Social Systems Assessment, detailing the key risks, gaps and recommendations. The recommendations for the Program Action Plan (PAP) were explained in detail followed by the implementation support to be provided by the World Bank. <u>Discussion</u> Followed by the presentation, the forum was opened for the discussions. Ms. Sarika Panda (Raahgiri Foundation) highlighted the need for non-motorized infrastructure (NMT) for pedestrian safety which is of utmost importance under any transport initiatives and the need to involve Municipal Corporations for the same. Also highlighted are the issues like road safety, dust and noise pollution and impacts on street vendors. The NGO expressed their willingness to get involved in the program activities as per the need. The WB responded that NMT and inclusive design aspects would be considered under the state-level public transport plan and strategies to be developed under the program. Development of plans and any initiative undertaken under the program will be done in a consultative manner to ensure transparency, participation and inclusion. Mr. Nirmal Kashyap, the EE, HSPCB, Air Cell had acknowledged the ESSA findings and mentioned about the mandate and obligation of PCB to take necessary steps for addressing the issues highlighted in the presentation such as dust and noise pollution, waste management etc. He concluded by mentioning that HSPCB will continue to take necessary actions, and will monitor the implementation.

	Conclusion The meeting was concluded by Ms. Sharlene by once again emphasizing the WB's obligation of consulting the stakeholders and thanking the participants.

ANNEX 4: ESHS RISKS ANALYZED AS PART OF GOVERNMENT SECTOR PROGRAMS

Sector	Schemes/Policies	EHS Issues
Urban	• Swachh Bharat Mission • Finance Commission Solid Waste Management Grants	• Uncovered construction activity • Open storage and carriage of construction materials • Open dumping of C&D waste and municipal solid waste • Fires at legacy waste dumpsites and landfills • Open burning of waste including plastic • Older public transport fleet
Agriculture	• Paramparagat Krishi Vikas Yojana (PKVY) • Rashtriya Krishi Vikas Yojana (RKVY) • National Project on Organic Farming (NPOF) • Pradhan Mantri Krishi Sinchai Yojana (PMKSY) • Biogas Development and Utilization Program • National Mission for Sustainable Agriculture (NMSA)	• Stubble burning, programs, and policies by the department • Overuse of fertilizer and recommendations by the department • Crop diversification • Manure storage and management
Domestic/Clean Cooking	• State Rural Livelihoods Mission • Swachh Bharat (Rural) • Bioenergy Program	• Use of solid fuels leading to indoor and ambient air pollution in rural areas • Time-consuming activity in collection of fuelwoods by women • Gender disparity and behavioral change • Severe effects on health of both women and children
Transport	• Motor Vehicle Act, 1988 • Voluntary Vehicle Fleet Modernization Program (V-VMP) and Vehicle Scrappage Policy	• Older polluting vehicles • Road paving and dust management • Functional scrapping facility • Waste management practices • Disposal of electronic and hazardous wastes • Greening initiatives

Sector	Schemes/Policies	EHS Issues
MSME	• MSME Sustainable (ZED) Certification • Consents for Establishment and Operation • Entrepreneurship Skill Development Programme (ESDP)	• Health and safety of workers working in polluting brick kiln running on old technologies. • Individual boilers in MSMEs leading to greater effect on air pollution. • Limited responsibility of industry owners on health and safety of workers in MSMEs • Lack of air pollution control devices in MSMEs • MSMEs running on DG sets causing higher level of air pollution.

Environmental Effects from Program Activities

Key Areas Relevant to EHS and OHS	Potential Environmental Affects	Level of Concern	Government Policies and Systems to Address These Risks	Institutional Responsibilities
Environment and Pollution Management	Fugitive emissions (dust, odor, and noise) C&D waste from minor civil works, emissions from processing of C&D waste, dust from road rehabilitation works	Low	• Environment Protection Act 1986 • The Air (Prevention and Control of Pollution) Act 1981, Amended 1987 and Rules • The Noise Pollution (Regulation and Control) Rules 2000 • Construction and Demolition Waste Management Rules 2016	• Regulated by the HSPCB through permits and licenses for construction of civil works and processing of C&D wastes and regular inspection
	Solid and plastic waste generation from civil work sites	Low	• Solid Waste Management Rules, 2016 • Plastic Waste Management Rules 2016	• Regulated by the HSPCB through permits and licenses for construction of civil works, and regular inspection
	Liquid waste (wastewater; chemicals) from civil works)	Low	• Water (Prevention and Control of Pollution) Act, 1974	• Regulated by the HSPCB through permits and licenses for construction of civil works, and regular inspection
	E-waste from EVs	Low	• E-waste (Management) Rules, 2016	• Original equipment manufacturers (OEMs) to collect back e-waste and channelize for collection/disposal; producer will arrange end-of-life disposal. Collection centers established by producer or recyclers registered with the HSPCB to dispose of the wastes in approved manner.
	Hazardous waste from replacing the old DG sets and batteries in EVs	Moderate	• The Hazardous and Other Waste Management Rules, 2016 • Guidelines for Environmentally Sound Facilities for Handling, Processing and Recycling of End-of- Life Vehicles (ELV) and lead acid batteries • Guidelines for disposal of used oil	• Regulated by the HSPCB through permits and licenses for registered recycling facilities and regular inspection/monitoring • Recycling of lead acid batteries through authorized recyclers licensed by the HSPCB

Key Areas Relevant to EHS and OHS	Potential Environmental Affects	Level of Concern	Government Policies and Systems to Address These Risks	Institutional Responsibilities
Health and Safety – Community and Workers	OHS of workers in ATS, C&D processing plants, and industries	Moderate	• The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 • The Occupational Safety, Health, and Working Conditions Code, 2020	• Labour Commissionerate
	• ATSs • C&D waste processing plants • Life and fire safety in buildings/ offices • Operation of boilers, DG sets in industries	Moderate	• National Building Code (NBC) of India, 2016, Fire and Life Safety • The Boilers Act, 1923	• Approvals under NBC are regulated through BIS. • Chief fire officer is responsible for obtaining clearances and compliance. • Regulated by Central Boilers Board under the DoI. Chief Inspector for Inspections during installation, repairs, renewals, and so on. • DG sets noise limits and conformity certification verification are regulated by the HSPCB.

Environmental Effects by Results Areas

Program Activities/Inputs	Risks	Mitigation/Risk Management	Benefits/Opportunities
RA 1: STRENGTHENING STATE CAPABILITIES FOR AIR QUALITY MANAGEMENT AND PLANNING			
• State Air Quality Management Planning • Upgrading the Air Quality Monitoring infrastructure stations by deploying upgraded Continuous Ambient Air Quality Monitoring Stations (CAAQMSs), state-of-the-art air laboratories to strengthen analysis capacity, mobile vans, and supersites • Centralized Decision Support System (DSS) • Institutional development and capacity building • Citizen and stakeholder engagement	• Setting up air quality monitoring stations, air labs, requires minor civil/upgrade works. The installation of equipment will take place in existing facilities; however, it may involve generation of noise and dust and noise. • The AQM stations, labs, and so on, require energy inputs. It is important to ensure that energy is sourced sustainably, such as from renewable sources to the extent possible. • The adoption of advanced technologies for air pollution monitoring, installation, and maintenance of monitoring equipment may have localized impacts. It is important to carefully assess the life cycle impacts of these technologies (considering e-waste, and so on) and put in place appropriate e-waste management practices. • Accurate data analysis is needed to have policies and actions. It is crucial to have trained experts and robust analysis frameworks to ensure proper interpretation and appropriate decision-making based on the collected data.	• The activity plans need to consider environment health and safety aspects. • Explore energy-efficient technologies and consider renewable energy sources for powering the monitoring infrastructure. • Follow the prescribed e-waste management practices (through registered recyclers) to minimize environmental impacts. • Training of manpower and experts and robust analysis frameworks to ensure proper interpretation and appropriate decision-making based on the AQM collected data.	• Accurate data on (ambient and industry) air quality collected within districts and communicated. • Dedicated AQM staff in the DoEFCC and HSPCB with clear roles and responsibilities for AQM will assist in better management of air pollution and stakeholder engagement. • Establishing a statewide AQM infrastructure that addresses primary and secondary sources.

Program Activities/Inputs	Risks	Mitigation/Risk Management	Benefits/Opportunities
• Knowledge sharing workshops for selected topics to be paired with neighboring states. • Lighthouse and knowledge sharing on crop residue management and EV transition • Sharing and promoting adaptation and replication of practices with learning states that will have added benefit of reducing $PM_{2.5}$ exposure in Haryana	• As this area will mainly finance technical assistance activities, knowledge sharing, and human resource capacity, the environmental risks are low. The objectives of the studies, working groups, and governance arrangements will positively affect environmental parameters on air quality, public health, and fuel quality.	• The success of these initiatives depends on effective policy design, implementation, and enforcement. Additionally, M&E is critical to assessing the actual environmental impacts and adjusting strategies as needed.	• Improvement in data collection, monitoring, reporting, and knowledge sharing on AQM issues
RA 2: ADVANCING SECTOR INTERVENTIONS FOR AIR POLLUTION REDUCTION			
REDUCING EMISSONS FROM AGRICULTURE • In-situ and ex-situ management of crop residues. Expanding availability of machinery for crop residue management • Machinery for harvesting and incorporation of crop stubbles into the soil	• Emissions from the machinery contribute to air pollution. • Above-ground harvesting of the straw will not fully address the issue of crop residue burning due to the need to burn the remaining stubbles.	• System of maintenance of vehicles, purchase of fuel-efficient equipment, scope for use of biofuel and other sources of renewable energy are to be explored. Promote in-situ incorporation of stubbles, spraying decomposer, and so on.	• Scope for demonstration of alternate practices to avoid crop residue burning

Program Activities/Inputs	Risks	Mitigation/Risk Management	Benefits/Opportunities
REDUCING EMISSIONS FROM TRANSPORT • Expanding electric bus fleet (in Gurugram and Faridabad). • Accelerating the transition of electric 3 wheelers in the two model cities (Gurugram and Faridabad) by replacing the old, polluting diesel 3 wheelers • Improving inspection and maintenance of heavy-duty vehicles • Incentivizing the phaseout of old and unfit vehicles • Establishment of robust vehicle testing infrastructure across the state.	• Introducing EV fleet and bus charging infrastructure might result in construction impacts and increased energy demand for infrastructure development and use, such as new parking spaces for charging stations, optimize the placement of charging stations to reduce congestion and demand for public spaces/passenger rest areas, toilet facilities, and so on. • The battery changes in EVs lead to generation of hazardous wastes and impacts on plant workers involved in dismantling vehicles.	• Introduce an environmental screening mechanism for selection of sites for e-vehicle infrastructure development. Mitigate impacts such as noise and dust pollution, waste management, worker safety, and so on during the civil works through integrating appropriate measures into contract management. • Include rest areas and toilet facilities at charging stations for buses. • Introduction of pedestrian alert systems and other devices on EVs and buses to enhance safety. Raise awareness among road users about the new EVs. • The hazardous wastes (lead acid batteries) should be handled through recyclers who are authorized and licensed by the HSPCB only. These facilities are expected to follow the regulations regarding safe disposals, worker safety, and so on. Awareness needs to be generated among the public on the same.	• Increased number of electric transport modes available for public transport-reduction in pollution, road dust, and vehicle fitness improved • Old and polluting heavy duty trucks scrapped and off the road or replaced with new and cleaner fuel trucks, positive impacts on air quality and safety

C&D WASTE RECYCLING AND REUSE7 • **Strengthened capacities C&D waste recycling and reuse.** • **SOP and C&D waste management plan prepared and approved in 2 urban local bodies (ULBs). Pilot tested in 2 ULBs (Gurugram and Faridabad).** • **ULBs have introduced C&D waste management contracts.** • **Improvements in reprocessing of C&D wastes. Demonstration projects undertaken for promotion of C&D reprocessed material. SOPs for recycled C&D waste products confirming mechanical and chemical properties and applications (within government projects).** • **Awareness and incentives to the construction industry and consumers about the benefits and**	• Insufficient training and capacity building for staff to effectively utilize and maintain the new technologies, limiting their long-term effectiveness. • Issues in C&D waste processing plants due to unsegregated waste, noise and dust emission during processing. Worker safety aspects in the absence of adherence to personal protective equipment (PPE). Open disposal of unprocessed wastes (fabric, foam, wood, and so on) may lead to landfill/dump sites within the processing facilities. • Lack of demand or mandate for use of C&D waste in government and other constructions to be addressed. • Improper disposal of the washed water will contaminate/pollute the surrounding environment. • Use of exotic species in greening activities will affect the local diversity and may create stress on water resources.	• Allocate adequate resources for training programs, including funding for trainers, materials, and follow-up sessions to reinforce learning. • Implement performance monitoring and accountability measures to ensure adherence to SOPs, such as regular inspections and reporting mechanisms. • Integrate mitigations for dust and noise control and ensure worker safety through adherence to PPE. Ensuring segregated waste for processing is important. Encourage handing over of unsegregated waste to local municipalities. • Develop contract clauses and demonstrations regarding use of the processed products will address the issues. • Adopt closed-loop system of washing and water recycling, which conserves water by filtering and reusing it. • Ensure selection of native species that adapt to the local climate and survive harsh weather conditions.	• **Systems for handling and processing C&D waste operationalized** • **Strengthened capabilities and improved C&D waste management** • **Increased demand for and use of C&D waste processed products reducing the footprint of construction activities** • **Maintaining cleanliness of vehicles and compliance with environmental regulations** • **Increased greenery across the state, conservation and enhancement of biodiversity/local species**

Program Activities/Inputs	Risks	Mitigation/Risk Management	Benefits/Opportunities
quality of recycled products. • **Practices for industrial vehicle wheel washing and road shoulder cover.** • **Greening master plan for the state focusing on dense urban plantations.**			

7 Now excluded from PforR and partially part of IPF component

Program Activities/Inputs	Risks	Mitigation/Risk Management	Benefits/Opportunities
ROAD DUST MANAGEMENT*8* • Improved control of road dust suspensions through rehabilitation of roads and mechanical sweeping. • Provide access and training to best available technologies for road dust mitigation and support piloting.	• Road rehabilitation works may lead to risks related to occupational health and safety of workers and communities (OHS and CHS). • The collected dust can become airborne again if it is not disposed of properly. Inefficient disposal leads to recurring dust problems. • Unpaved surfaces may lead to limited coverage of mechanical sweeping • Operational inefficiencies and lack of regular maintenance (releasing clogged pores, cleaning the filters, and so on) of the machines may lead to frequent breakdown and reduced performance. • Health risks for the workers involved in operation of machines.	• Workers should use PPE. Traffic management/diversions are to be ensured as required. • The collected dust should be disposed of or dumped in a preidentified designated location and should be secured (covering, water sprinkling and land filling) to avoid reentering into the environment. • The machines need to be serviced regularly and staff/workers should be trained on O&M aspects. • The workers should use PPE. Mitigate dust and noise, avoid habitats, if any use sustainable materials. Use of personal protective gears such as uniform, helmet, reflective vest, eye gear, gloves, safety shoes, and ear muffs should be compulsory for helpers who often get down these machines to facilitate brush operation.	• Reduction in respirable suspended particulate matter (RSPM) without any impact of human workforce and public • Improved air quality • Efficient dust management, better drainage, and reduced water damage and erosion • Systems for road dust management operationalized

8 *Now excluded from PforR and partially part of IPF component*

Program Activities/Inputs	Risks	Mitigation/Risk Management	Benefits/Opportunities
INDUSTRY Conversion to cleaner boilers in MSMEs (1,000) Replacing old DG sets and introducing new DG sets (2,000)	• Many industries do not use the energy-efficient or advanced clean technologies leading to extra emissions than required. However, there will be high power/gas demand in case of cleaner boilers. • Infrastructure upgrade may be required which may lead to noise and dust pollution. • Irregular maintenance of boilers poses the risk of explosion. • Worker safety issues may emerge during operation and maintenance of boilers if not done under proper inspection and guidance. • The disposal of the DG sets without proper dismantling/recycling can lead to soil and water contamination. Batteries and spent oil are hazardous waste which can leach into soil and contaminate water.	• Encourage industries to invest in state-of-the-art cleaner technologies and energy efficient equipment toward sustainable production processes. • Conformity certification and noise pollution limits should be adhered to. • Upgrade works to include mitigations as needed. • Ensure fire safety, alarm, hydrants, and extinguisher as per need. Proper trainings and mock drills to be conducted for the operators. • Workers should use PPE, especially eye, ear, and respiratory protection. Regular inspection of the equipment is to be carried out (cracks and so on). • The old sets should be disposed of through registered recyclers only, especially batteries, metals, and oil. The DLI6 (adoption of clean technologies in selected industrial clusters) verification procedure includes - verification of and certification of decommissioning and dismantling of the older equipment at registered recycling facilities to ensure safe disposal.	• Reduction in particulate matter pollution from MSMEs in the state • Improved energy efficiency and air quality • Reduced air and noise pollution, improved energy efficiency

Social Effects by Result Areas

Proposed Investments/Activities	Potential Social Risks	Mitigation Measure/s
RA#1: STRENGTHENING STATE CAPABILITIES FOR AIR QUALITY MANAGEMENT AND PLANNING		
• Preparation of AQM DSS plan and implementation for multisector decision-making. • Preparation of AQM infrastructure upgrade plan and implementation • Updating of the State Plan for Clean Air • Capacity-building activities/ training on AQM • Strengthening of the grievance redressal system • Access to global knowledge and technology for AQM monitoring and mitigation. • Citizen and stakeholder engagement	• Limited outreach and awareness on availability of AQM skill trainings for stakeholders. • CAAQMSs, air labs, and supersites will require new offices and most likely be situated within existing premises. However, since exact sites are not known at this stage, these sites may not be encumbrance-free, leading to risk of displacement of squatters and encroachers on these public lands. • OHS risks for workers engaged in building (offices, labs, monitoring stations) construction, facility upgrade, and installation of equipment. • Low awareness among community members about grievance mechanism. • Limited impact of mobilization efforts on the community.	• Raise awareness around availability of trainings among government and stakeholder groups. • Screen all potential sites for adverse resettlement impacts, including physical and economic displacement. • Effective contract management to ensure worker safety and fair working conditions. Code of conduct for workers to prevent SEA/SH risks and training of workers on safe practices. • Ensure grievance mechanism is accessible to all social groups and build awareness on its availability. • Develop M&E systems to measure the impact of such citizen engagement programs.
• Knowledge-sharing workshops for selected topics to be paired with neighboring states	• No anticipated social risk	• Better coordination among agencies and improved diagnostics are likely to improve accountability around AQM.

Proposed Investments/Activities	Potential Social Risks	Mitigation Measure/s
RA#2: ADVANCING SECTOR-SPECIFIC INTERVENTIONS FOR AIR POLLUTION REDUCTION		
AGRICULTURE AND RESIDENTIAL SECTOR • In-situ and ex-situ management of crop residues • Expanding availability of machinery for crop residue management • Developing and strengthening the value addition, value chain, and market links for crop residue (for example, briquette/pellet making, bio-char and biofuels generation as appropriate • Innovative business enterprises to address agriculture wastes • Mobilizing the private sector through incentives to bring in timely aggregation, assured market, and remunerative prices	• Risk of exclusion of socially and economically vulnerable farmers/SHGs/female entrepreneurs from accessing the program benefits and incentives including machinery • Limited forums/interface for seeking feedback and addressing concerns of potential beneficiaries to access the Program benefits • Limited opportunities for stakeholder engagement during development of value chain and market links.	• Ensure selection criteria of clusters and beneficiaries for access to technical and financial support are transparent and consider representation from vulnerable groups (BPL, ST/SC, women, and PwD). • Ensure participation/engagement of beneficiaries in the preparation of cluster development plans including value chain development. • Strengthen the system for addressing grievances, conduct periodic surveys with beneficiaries to seek feedback, and build awareness on its availability.

Proposed Investments/Activities	Potential Social Risks	Mitigation Measure/s
TRANSPORT • Expanding electric bus fleet (in Gurugram and Faridabad, 575 e-buses deployed in 11 cities including 150 in Gurugram and 50 in Faridabad) • Setting up permanent funding mechanism at state and/or city level to bridge viability gap • Establishing non-captive charging infrastructure for fleet electrification. Setting up 500 charging stations/battery swapping stations through private sector in Gurugram • Accelerating the transition of electric three-wheelers in the two model cities (Gurugram and Faridabad) by replacing the old, polluting diesel three-wheelers • Improving inspection and maintenance of heavy–duty vehicles. Establishment of robust vehicle testing infrastructure across the state • Planning time-bound vehicle scrapping of government-owned vehicles that are older than 15 years (as per MoRTH mandate) • Implementing a comprehensive IEC and (BCC strategy	• Limited support and willingness of stakeholders to switch to cleaner fleet due to inadequate outreach to disseminate information about policy changes • Exclusion of poor and vulnerable users from the rollout of fiscal incentives due to either low awareness generation or inaccessible procedures/systems to access benefits • Risk that policy, guidelines, and mobility plans may not adequately consider needs of women, PwD, or other vulnerable groups • EV charging and associated infrastructure may require spaces within existing public or private facilities that are not unencumbered • Limited endorsement from stakeholders for phasing out/replacement of old heavy-duty trucks and three-wheelers • Community health and safety risks, including women's safety with the new buses and three-wheelers in operation, including in depots, ATSs, and other related infrastructure • OHS risks for workers engaged in vehicle scrapping not integrated in the plan • Effectiveness and impact of behavioral change programs not assessed, which may result in non-sustainability of such programs	• Development of EV policy, guidelines, comprehensive mobility planning to ensure consultations with all stakeholders, including those from vulnerable groups and women, to incorporate their mobility needs • Undertaking of awareness creation on policy changes and adoption including rollout of fiscal incentives, transition, and phasing out of old vehicles • Training and awareness of drivers and conductors engaged in operating the buses and three-wheelers on public safety and safe handling of EV batteries • Training and awareness of workers engaged in scrapping facilities and EV battery charging stations on health and safety practices including SEA/SH prevention. • Ensuring all transportation infrastructure are gender/socially inclusive and safer, by designing for women and PwD (gender segregated and universally accessible toilets, feeding rooms, seating arrangements, well-lit spaces, and so on), ensuring a responsive grievance redressal system, and conducting safety and accessibility audits. • Ensuring IEC and BCC are provided to all target groups. Monitoring and evaluating the impact of public awareness and behavior change campaigns carried out to address the underlying behavioral issues.

Proposed Investments/Activities	Potential Social Risks	Mitigation Measure/s
MUNICIPAL AND C&D WASTE MANAGEMENT*9* • Strengthened capacities for municipal and C&D waste management • Actions to reduce burning of wastes. Training of municipal staff on SOPs for prevention of dumpsite fires. • SOP and C&D waste management plan prepared and approved in 2 ULBs. Pilot tested in 2 ULBs (Gurugram and Faridabad) • ULBs have introduced C&D waste management contracts • Improvements in reprocessing of C&D wastes. Demonstration projects undertaken for promotion of C&D reprocessed material. SOPs for recycled C&D waste products confirming mechanical and chemical properties and applications (within government projects) • Awareness and incentives to the construction industry and consumers about the benefits and quality of recycled products. • Provide access and training to best available technologies for road dust mitigation and support piloting (urban road rehabilitation) • Greening master plan for the state focusing on dense urban plantations.	• Trainings on SOPs and available technologies not accessible to all first responders/on-ground staff including small or local contractors • Inadequate outreach on C&D waste management and dumpsite fires, limited by factors such as geographical spread and resource allocation • Limited focus on issues related to OHS and CHS in SOPs related to dumpsite fires, construction, and dust management • Limited engagement with all stakeholders during development of SOPs for dumpsite fires, C&D dust management, and so on and greening master plans • Physical and economic displacement of squatter and encroachers due to greening activities and urban road rehabilitation • Temporary disruption of traffic and inconvenience to the public during greening activities and road rehabilitation	• Training and awareness of all stakeholders to adapt to new technology and minimize OHS and CHS risks. Ensure all related SOPs address issues of OHS and CHS risks as well. • Allocate adequate resources and prepare strategies for implementation and monitoring for effective targeting of IEC activities. • Ensure development of SOPs and plans are done in a consultative manner. • Ensure inclusive measures to support access of C&D waste management measures and waste products to contractors, industries, and consumers. • All potential greening sites and urban roads for rehabilitation need to be screened for adverse resettlement impacts, including physical and economic displacement. For other potential risks, prepare and implement appropriate mitigation plans.

9 *Now excluded from PforR and partially part of IPF component*

Proposed Investments/Activities	Potential Social Risks	Mitigation Measure/s
INDUSTRY • Converting to cleaner boilers in MSMEs (1,000?) • Replacing old DG sets and introducing new DG sets (2,400?)	• Infrastructure upgrade and operation may result in risks related to occupational and community health and safety.	• Ensure adequate safety measures are incorporated and trainings are provided to workers/operators.

ANNEX 5 RELEVANT LAWS AND POLICIES APPLICABLE TO THE PROGRAM

The GoI and the state government have enacted a range of laws, regulations, and procedures relevant to managing the E&S effects of the proposed Program. The table lists legal instruments that manage the pollution streams, wastes, wastewater, infrastructure, labor, OHS, community/public health and safety, and building safety (life and fire safety) including land-related aspects relevant to the Program RAs.

GoI ESHS Policies Applicable to the Program

Sl. No.	Applicable Act/ Regulation/Policy	Objective and Provisions	Relevance to the Program and Key Findings
Environment Protection laws/pollution prevention			
1	Environment Protection Act 1986	The Environment (Protection) Act was enacted in 1986 with the objective of providing for the protection and improvement of the environment. It empowers the Central Government to establish authorities [under section 3(3)] charged with the mandate of preventing environmental pollution in all its forms and to tackle specific environmental problems that are peculiar to different parts of the country. The act was last amended in 1991.	Relevant to the Program as this act has mandate of preventing pollution in all its forms. The Program focusses on air pollution as the main challenge in Haryana State and the Program supports an implementation program in strengthening all sectors and institutional capacity of the state.
2	The Air (Prevention and Control of Pollution) Act 1981, Amended 1987 and Rules	To provide for the prevention, control, and abatement of air pollution in India	Relevant to all the sectors that are dealt with such as biomass burning in residential/agriculture sector, NO_2 and SO_2 produced from transport, dust emissions from cleaning roads, constructions, disposal of municipal waste, processing of C&D wastes, and leading to unnecessary waste burning, crop residue burning, emissions from power plants, emissions from MSMEs using technology leading to non-cleaner production (in efficient boilers and DG sets).
3	Water (Prevention and Control of Pollution) Act, 1974:	This act addresses water pollution by regulating the discharge of pollutants into water bodies, setting up standards for water quality, and establishing central and state PCBs to monitor and enforce compliance.	Various enterprises (C&D processing, recycling of electronic and hazardous wastes, industries, vehicle wheel washing, and so on) may generate wastes that could contaminate water bodies. The policy sets the standards and monitoring protocols for effluent management

Sl. No.	Applicable Act/ Regulation/Policy	Objective and Provisions	Relevance to the Program and Key Findings
4	National Ambient Air Quality Standards (NAAQS)	To combat air pollution, it is required to identify the pollutants and the source of emission and investigate the effects on living and the environment. The CPCB has notified the revised National Ambient Air Quality Standards Gazette of India, Extraordinary Part-II Section 3, subsection (ii), dated November 18, 2009.	Relevant as the program aims to achieve NAAQS standard (40 µg/m^3) with the implementation of the Program in Haryana
5	Solid Waste Management Rules, 2016	Apply to every municipal authority responsible for the collection, segregation, storage, transportation, processing, and disposal of municipal solid wastes.	Waste generated in urban and rural areas will be managed though SWM interventions. Storage, transport, handling, recycling/reuse, disposal of solid wastes including packaging materials under all Program activities.
6	Plastic Waste Management Rules 2016	All institutional generators of plastic waste shall segregate and store the waste generated by them in accordance with the Solid Waste Management Rules and hand over segregated wastes to authorized waste processing or disposal facilities or deposition centers, either on its own or through the authorized waste collection agency.	Relevant as one of the sectors dealt is treating municipal waste in planned manner and waste burning which will include plastic waste.
7	E-waste (Management) Rules, 2016	Applies to every manufacturer producer, consumer, bulk consumer, collection centers, dealers, e-retailer, refurbisher, dismantler, and recycler involved in manufacture, sale, transfer, purchase, collection, storage, and processing of e-waste or electrical and electronic equipment listed in Schedule I, including their components, consumables, parts, and spares which make the product operational but shall not apply to (a) used lead acid batteries as covered under the Batteries (Management and Handling) Rules, 2001 made under the Act; (b) microenterprises as defined in the Micro, Small and Medium Enterprises Development Act, 2006 (27 of 2006); and (c) radioactive wastes as covered under the provisions of the Atomic Energy Act, 1962 (33 of 1962) and rules made thereunder.	Relevant, as it is applicable for consumers or bulk consumers. The disposal of e-wastes to be done at the specified collection centers of registered recyclers and reported annually applicable to all programs where e-waste is generated including electrical/electronic equipment. As per rules, the manufacturer must collect back e-waste and channelize for collection/disposal; producer (seller of the assembled product under own brand) shall arrange end-of-life disposal under extended producers' responsibility and create awareness on this; collection centers established by producer/dealer (lighting agencies/dealers) can also collect e-waste on behalf of dismantler, refurbisher, and recycler, including those arising from orphaned products. The hazardous wastes (lead acid batteries, old spent oil) from battery changes facilities to be disposed of through authorized and licensed recyclers.

Sl. No.	Applicable Act/ Regulation/Policy	Objective and Provisions	Relevance to the Program and Key Findings
8	Construction and Demolition Waste Management Rules 2016	The rules shall apply to every waste resulting from construction, remodelling, repair, and demolition of any civil structure of individual or organization or authority who generates C&D waste such as building materials, debris, and rubble.	Relevant for any small-scale civil works carried out to ensure that dust generated from C&D waste is managed appropriately at each work site
9	Hazardous waste Management Rules 2016	These rules shall apply to the management of hazardous (lead acid batteries) and other wastes as specified to ensure safe handling, generation, processing, treatment, package, storage, transportation, use reprocessing, collection, conversion, and offering for sale, destruction, and disposal.	Relevant for e-vehicle maintenance, replacement of old DG sets in MSMEs to ensure the hazardous wastes (lead acid batteries), spent oil, and so on, are disposed in safe and prescribed manner through the recyclers who are authorized and licensed by SPCB
10	Boilers Act 1923	The act is to protect people's lives and property from the dangers of steam boiler explosions and create uniformity in registration and inspection during boiler operation and maintenance in India.	Relevant for the conversion to cleaner boilers in the MSME sector, ensuring inspections during installation, repairs, and renewals and adherence to safety protocols during operation
Transport			
11	Motor Vehicle Act, 1988	An act to consolidate and amend the law relating to motor vehicles	Relevant as there will be change in existing HDV fleet and public buses to cleaner emission (BS VI or better) buses and trucks replacing an old fleet which is scrapped. This law would regulate the new fleet on the road.
12	Voluntary Vehicle Fleet Modernization Program (V-VMP) and Vehicle Scrappage Policy:	The V-VMP is a policy aimed at incentivizing the replacement of old, polluting vehicles with new ones. Under this program, vehicles older than 15 years are eligible for voluntary scrapping, and vehicle owners receive incentives or discounts when purchasing new vehicles. The GoI announced a new Vehicle Scrappage Policy in 2021 to promote the scrapping and recycling of old vehicles. The policy primarily targets commercial vehicles such as trucks and buses. It proposes mandatory fitness testing for vehicles age 20 years for personal vehicles and 15 years for commercial vehicles. Noncompliant vehicles will be liable for higher fees and penalties.	Interventions under the Program will be consistent with the policy objectives and will aim at incentivizing further to achieve good air quality outcomes.

Sl. No.	Applicable Act/ Regulation/Policy	Objective and Provisions	Relevance to the Program and Key Findings
13	The Motor Transport Workers Act, 1961	Provides for the welfare of motor transport workers, regulates the conditions of their work, including hours of work and their health provision of canteen, restrooms, medical and first aid facilities, daily and weekly rest, prohibition of child labor, and compensatory leave in motor transport undertakings with more than 100 workers.	Applicable, as the project will introduce a new fleet of EV buses and support capacity building of workers for safe driving and switch to EVs that are operated by these workers. Compliance with provisions of this act will be monitored.
Agriculture/ Rural			
14	The National Policy for Management of Crop Residue, 2014:	This policy aims to promote sustainable and environmentally friendly practices for managing crop residues, especially the residues from paddy and wheat crops. It encourages the use of residue for various purposes such as composting, bioenergy, and fodder.	Interventions under the Program will be consistent with the policy objectives, strategy, and technological aspects as well as financial incentives.
Occupational Health and Safety			
15	Factories Act 1948	Provides regulations for the safety, health, and welfare of workers in factories, including provisions for cleanliness, ventilation, lighting, and drinking water. Requires factories to take measures to prevent accidents and ensure the use of safety devices and protective equipment.	Applicable for labor employed in larger enterprises such as C&D processing facilities Sets limits on working hours, overtime, and employment of young workers Mandates the appointment of safety officers and constitution of safety and grievance committees in certain cases Provides for the inspection and enforcement of safety standards by factory inspectors

Sl. No.	Applicable Act/ Regulation/Policy	Objective and Provisions	Relevance to the Program and Key Findings
16	The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996	Regulates the working conditions and welfare of construction workers. Requires the registration of construction workers, provision of welfare measures, and safety training.	Relevant for worker welfare and safety. The act mandates the establishment of safety committees and the adoption of safety measures at construction sites. Provides for the inspection and enforcement of safety standards by inspectors. The state has a functional BOCW Welfare Board and offers a host of schemes related to maternity and girl child support, scholarships, skilling support, critical illness treatment, death and disability assistance, and family pension and schemes to create awareness on entitlements and benefits.
17	The Occupational Safety, Health, and Working Conditions Code, 2020	This is a recently enacted comprehensive code that consolidates and modernizes existing labor laws related to occupational safety, health, and working conditions. It covers various aspects, including safety, health, welfare, working hours, leaves, and social security for workers in all establishments	Relevant for worker welfare and safety The code provides for the appointment of safety officers, constitution of safety committees, and the establishment of occupational safety and health advisory boards. It also introduces provisions for the protection of workers in hazardous occupations and enhances penalties for non-compliance with safety standards.
18	Right to Information Act, 2005	Provides a practical regime of right to information for citizens to secure access to information under the control of public authorities	Provides framework for disclosing information to the public including air quality data, financial information, and environmental clearances. The act (a) sets out obligations of public authorities with respect to provision of information; (b) requires designating a Public Information Officer; (c) sets out process for any citizen to obtain information/disposal of request, and so on; and (d) provides for institutions such as Central Information Commission/State Information Commission.

Sl. No.	Applicable Act/ Regulation/Policy	Objective and Provisions	Relevance to the Program and Key Findings
Land and Livelihood related Impacts			
19	Haryana Land Pooling Policy-2022	The policy is a government initiative designed to promote planned development, enhance infrastructure, and encourage voluntary participation of landowners in the development process.	Relevant to the Program in case land is needed for any physical infrastructure development (cattle shelters, labs, and so on)
20	Haryana Municipal Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, 2014	Protect the rights of urban street vendors to earn livelihood and regulate street vending activities and compensate for their loss of assets	Relevant to the Program in case land is required for physical infrastructure development (greening and so on)
Gender and Social Inclusion			
21	Maternity Benefit Act, 1961	Regulates employment of women for certain period before and after childbirth and provides for maternity benefit in establishments	Safeguards the interest of female personnel engaged under the Program
22	Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013	Provides guidance on redressal against sexual harassment complaints, including its internal investigation in a time-bound manner	Legal protection to project employees against SEA/SH at the workplace
23	Rights of Persons with Disabilities Act, 2016	Provides for non-discrimination in public spaces including transport and built environment	Infrastructure planning must adhere to universal design principles, ensuring accessibility for all.
24	Haryana Reservation Policy	Provides reservation for marginalized groups such as SC, BC, and economically backward persons in employment and educational/technical/professional institutions	Opportunities for the vulnerable and safeguards against discrimination at the workplace
Important Guidelines relevant to the Program			

Sl. No.	Applicable Act/ Regulation/Policy	Objective and Provisions	Relevance to the Program and Key Findings
25	XV-FC Technical and Operational Guidelines	The operational and fiscal guidelines are intended for urban agglomeration cities. NCAP non-attainment cities follow the guidelines of the XV-FC. This provides the target for 42 urban agglomeration (million plus population) cities based upon performance-based grants based on improvement in air quality for FY 2020–21 to 2025–26 under million-plus cities challenge Fund (MPCCF) and INR 12,139 crores have been allocated.	Relevant to the program as Haryana contains two urban agglomeration cities (Gurgaon and Faridabad) which is part of the Program and is part of RA 2
26	CPCB Guidelines for Environmentally Sound Facilities for Handling, Processing and Recycling of End-of- Life Vehicles (ELV)	The CPCB has issued guidelines to ensure the environmentally sound management of ELVs in India. These guidelines aim to minimize the environmental and health risks associated with the handling, processing, and recycling of ELVs. The guidelines outline measures for the treatment and disposal of various waste streams generated during ELV processing. These include the management of non-metallic waste, plastics, rubber, glass, and fluids. Treatment methods should focus on recycling, recovery, and safe disposal to minimize waste generation and its impact on the environment.	Relevant to all vehicle scrapping facilities. The guidelines emphasize the need for authorized collection centers and storage facilities for ELVs. These facilities should adhere to safety and environmental standards to prevent any potential hazards or pollution. ELVs should be dismantled and shredded in designated facilities. The guidelines provide recommendations for safe dismantling practices, including the removal of hazardous materials such as batteries, fuel, and oil. Shredding should be carried out using appropriate technologies to maximize resource recovery and minimize environmental impact. The guidelines also highlight the proper management of hazardous materials found in ELVs, such as lead acid batteries, mercury switches, and airbags.
27	Guidelines for Continuous Emission Monitoring Systems	The CPCB in India has developed guidelines for Continuous Emission Monitoring Systems (CEMS). These guidelines provide a framework for the installation, operation, and maintenance of CEMS in industries to monitor and control their emissions effectively.	These guidelines aim to ensure accurate and reliable monitoring of emissions from various industries and facilitate compliance with environmental regulations.