Draft

GOVERNMENT OF NEPAL

Ministry of Forest and Environment

Ministry of Industry, Commerce and Supplies

and

Department of Environment

Nepal Clean Air and Prosperity (CAP) Project

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)

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EXECUTIVE SUMMARY

1. BACKGROUND

Air pollution in Nepal has reached alarming levels, primarily driven by outdated technologies, traditional fuel use, and industrial activities, with Kathmandu Valley and the Terai region among the hardest hit. In Nepal, key pollution sources include boilers and furnaces used across various sectors, particularly food and beverage, textiles, and hospitality, that predominantly rely on biomass fuels like firewood and rice husk.

Nepal initiated ambient air quality monitoring in the early 1990s, expanded it in 2002 with support from the Danish International Development Agency, and re-established efforts following the 2012 National Ambient Air Quality Standards (NAAQS), resulting in 30 monitoring stations and an online portal providing real-time data on particulate matter and select gases. However, further upgrades are needed to monitor all NAAQS parameters, particularly Lead and Benzene, and to expand gaseous pollutant monitoring for effective public health and environmental response strategies.

The Government of Nepal (GoN), Ministry of Forest and Environment (MoFE) and Ministry of Industry Commerce and Supply (MoICS) with support from the World Bank, is implementing the Nepal Clean Air for Prosperity (CAP) Project to address severe air pollution in the Kathmandu Valley and Terai region. The CAP Project's primary objectives are to (1) accelerate and cost-effectively reduce emissions from targeted industrial and commercial sources that are primary contributors to air pollution in the Kathmandu Valley and Terai region and (2) strengthen air quality monitoring, governance, and enforcement in the country. The project focuses on cost-effective emission reductions from key industrial sources that significantly impact public health. Additionally, it aims to enhance air quality monitoring, governance, and enforcement nationwide.

The project will have the following four core components:

Component 1: Adopting cleaner production technologies to reduce $PM_{2.5}$ emissions

Component 2: Strengthening air quality monitoring, policy setting, enforcement capacity, and regional cooperation

Component 3. Project management, monitoring, and capacity building

Component 4. Contingency emergency response component (CERC).

2. ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)

This Environmental and Social Management Framework (ESMF) sets out the policies and procedures for managing the Environmental and Social (E&S) risks and impacts of the project activities when specific interventions and locations under the project are not identified and their specific impacts are not known

during project design and preparation. This report has been prepared in accordance with the World Bank Environmental and Social Framework (ESF) including ten Environmental and Social Standards (ESS). The scope of the assessment and framework will cover seven (ESS1, 2, 3, 4, 7, 9 and 10) of the World Bank's Environmental and Social Standards (ESS) listed below.

2.1. Applicability of the World Bank Environmental and Social Standards

WB ESS	Relevance	Overview of Relevance to ESS
ESS 1: Assessment and management of environmental and social risks and impacts	Relevant	Project activities include civil works, replacement of boilers, furnaces, and kilns, upgrading of air quality monitoring stations, and establishment of an environmental laboratory, all of which may pose potential environmental and social risks
ESS 2: Labor and working conditions	Relevant	This standard will be applicable to all project workers, including contractors, consultants, and government employees involved in the project. However, labour influx is not anticipated, as most workers are expected to already be engaged in industry operations under Component 1, while Component 2 will require only a small number of workers for a limited period.
ESS 3: Resource efficiency and pollution prevention and management	Relevant	This standard will apply due to the potential for air and water pollution from demolition activities and refractory waste under Component 1, as well as possible waste generated from the operation of air quality monitoring stations and laboratory under Component 2
ESS 4: Community health and safety	Relevant	Boiler and furnace replacements will be carried out in-situ, and the air quality monitoring stations are expected to pose minimal community health risks. However, areas adjacent to industries and AQMS may be used for storage and transportation activities, which could have limited impacts on nearby communities and the surrounding environment. Therefore, as a precautionary measure, this standard has been considered relevant.
ESS5: Land acquisition, restrictions on land use and involuntary resettlement	Not Relevant	The project does not include activities that would require land acquisition, leading to the physical or economic displacement of the people.
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	Not Relevant	The project activities, will be constructed in existing premises and is not anticipated to affect or involve any impacts on biodiversity or natural resources.
ESS 7: Indigenous Peoples/Sub-Saharan African Historically	Relevant	The project will be implemented in Kathmandu Valley and the Terai region where Indigenous groups reside. The project is unlikely to cause

WB ESS	Relevance	Overview of Relevance to ESS
Underserved Traditional Local Communities		adverse impacts on indigenous peoples, as it does not involve land acquisition, restrictions on land use, or leasing of land owned by indigenous communities. However, there is a potential risk of excluding indigenous peoples, such as indigenous-owned enterprises or workers, from project benefits. Therefore, as a precautionary measure, this standard has been considered relevant.
ESS8: Cultural Heritage	Not Relevant	The project will support the improvement of existing facilities; this is not considered relevant.
ESS9: Financial Intermediaries (FIs)	Relevant	Component 1 (sub-component 1.2) will utilize Financial intermediary (FIs) for the channelling of project funds to the industries, for establishment or improvement of targeted industries/enterprises in adopting clean technology
ESS 10: Stakeholder Engagement and Information Disclosure	Relevant	The project will ensure that it will adopt a consistent, comprehensive, coordinated, and culturally appropriate approach for engaging stakeholders and disclosing project related information.

In addition to this ESMF, a standalone Stakeholder Engagement Plan (SEP) and a standalone Labor Management Procedure (LMP) have also been developed. The SEP outlines how the project will conduct meaningful consultations with stakeholders throughout its lifecycle. The LMP details the project's approach to manage and mitigate labor-related risks and impacts in accordance with national legislation and the World Bank's ESF. Additionally, the project has an Environmental and Social Commitment Plan (ESCP), which outlines the measures and actions the Government of Nepal must undertake to comply with the World Bank's ESF. The ESCP is a legally binding agreement between the Government of Nepal and the World Bank.

3. POTENTIAL ENVIRONMENTAL AND SOCIAL RISKS

The environmental and social due diligence classified the project as a **Substantial Risk** project due to the client's currently limited institutional capacity to effectively manage environmental and social issues. It includes four major components, as outlined in the background section. The main environmental and social (E&S) risks and impacts are expected to arise from:

- Dismantling, transportation, and disposal of old boilers and furnaces under Component 1.2, and
- Dust and noise emissions from minor civil works related to the upgrade and establishment of air quality monitoring stations and laboratories under Component 2.
- Exclusion of vulnerable groups and enterprises from the project benefits

The types of activities expected under these components that may have potential E&S impacts include:

- Replacing old boilers and furnaces that use fossil fuels or biomass with new, energy-efficient models running on cleaner fuels for small and medium enterprises (SMEs)
- Improving the reliability of the existing network of 30 air quality monitoring stations
- Establishing new air quality monitoring stations
- Upgrading infrastructure and equipment of Department of Environment's laboratory (including the construction of a new laboratory)
- Enhancing the capacity of selected monitoring stations to measure additional pollutants such as PM2.5, black carbon (BC), sulfur dioxide (SO_2), nitrogen oxides (NO_x), and ozone (O_3)

Although the specific details of interventions and construction scope are still at an early stage, the project is likely to generate the following risks and impacts: i) Waste generation from the demolition of existing structures housing boilers, furnaces, and kilns; ii) Waste from dismantled boilers, furnaces, and kilns, including bottom ash, leftover coal or biomass fuel, and refractory materials; iii) Air, noise, and water pollution from construction activities and waste disposal at selected enterprise sites; iv) Possible hazardous e-waste from the operation of air quality monitoring stations and effluents from laboratories; v) Occupational Health and Safety (OHS) and Community Health and Safety (CHS) risks during both construction and operation phase of Components 1 and 2; vi) Potential social tensions during construction activities; vii) low Risks of Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) during both construction and operation phases; viii) possibility of inadequate stakeholder consultation and weak information sharing; ix) Limited capacity of Project Implementation Units (PIUs), financial institutions (FIs), and SMEs to manage E&S risks effectively.

4. ENVIRONMENTAL AND SOCIAL RISK MANAGEMENT PROCEDURES

The Environmental and Social (E&S) risk management procedures help integrate environmental and social considerations into design and implementation of activities. These procedures enhance risk management and identify suitable measures for mitigating risks. This ESMF applies to all project activities. The E&S risk management involves the following steps:

A) E&S Screening: All civil works will undergo an initial screening to:

- Confirm eligibility criteria listed in *Annex 1*.
- Identify potential environmental and social risks and impacts and assign a category and type to the sub-project.
- Determine the level and scope of environmental and social assessments needed, and the specific measures required to manage identified risks and impacts.

A screening checklist has been prepared for use during this process (*see Annex 2*). The Environmental and Social Management Framework (ESMF) guides this screening and assessment process, ensuring compliance with Nepal's legal framework and the World Bank's ESF and its ESS. The Project Implementation Units

(PIUs), will conduct the screenings and finalize the screening following prior concurrence from the World Bank.

B) Sub-project Categorization[1]: Sub-projects will be categorized into four types based on the screening results:

Category I: These sub-projects are ineligible for support under the CAP Project. A list of these excluded projects is provided in Annex 1.

Category II[2]: These sub-projects have limited adverse environmental or social impacts restricted to the project area, and these impacts can typically be addressed using well-known mitigation measures. Such projects might require a Brief Environmental Study (BES), an Initial Environmental Examination (IEE), or an Environmental Impact Assessment (EIA), along with an Environmental and Social Management Plan (ESMP), complying with both national and World Bank standards.

Category III: These sub-projects have some adverse impacts or risks, but these are site-specific, reversible, and easily managed with appropriate mitigation measures. Preparation of an ESMP is required, and occasionally, a Brief Environmental Study (BES) might be necessary according to government regulations.

Category IV: These sub-project activities will have minimal or no adverse environmental and social impacts. After the initial E&S screening, no further assessments are required for these sub-projects. The screening report will recommend mitigation measures for any minor impacts identified. In specific situations, site-specific guidance, such as an Environmental and Social Code of Practice (ESCoP), may be provided. Many project activities, including the strengthening and expansion of Air Quality Monitoring (AQM) stations, fall into this category

C) Environmental and Social Assessment of Activities:

After activities have been screened and categorized and based on the determination of the category, the Project Implementation Units (PIUs), will prepare a Terms of Reference (TOR) for Environmental and Social (E&S) Assessments accordingly.

The PIUs will either conduct these assessments themselves or hire consultants to carry them out based on the approved TOR. Either the PIU or the designated consultant will prepare necessary E&S documents based on E&S category of the activity. If necessary, additional management plans, such as an Emergency

[1] Category I subproject is similar to high-risk category subproject of WB ESF; Category II subproject is similar to substantial risk category subproject of WB ESF, Category III subproject is similar to moderate risk category subproject WB ESF and Category IV subproject is similar to low-risk category subproject in WB ESF.

[2] The CAP project is designed to reduce air pollution and its associated impacts, primarily resulting in positive environmental and social (E&S) outcomes. Currently, we do not anticipate any sub-projects requiring a detailed Environmental and Social Impact Assessment (ESIA) or even an Environmental Impact Assessment (EIA). However, as a precaution for potential future scenarios, this has been incorporated into the procedure

Response Plan, will also be prepared alongside the E&S Assessment reports and sub-project-specific ESMPs, BES/IEE/ EIA or ESCoP.

E&S Specialists from both the PIUs will collaborate with the project design teams to integrate environmental and social measures into civil works activities in order to minimize and mitigate E&S risks and impacts.

Guidance provided in Section 7.1 of the ESMF will be followed during the selection of project sites, planning, and design. No civil works will begin until all required environmental and social documents have been prepared and approved by the Government of Nepal (GoN) and/or the World Bank (WB).

D) Implementation of Mitigation Measures:

Environmental and social screening will determine if Environmental and Social Impact Assessments (ESIAs) with ESMPs, standalone ESMPs, or Environmental and Social Codes of Practice (ESCoPs) are required (refer to Table 7-1 of the ESMF). ESMPs and ESCoPs will detail monitoring objectives, technical monitoring requirements, reporting procedures, and the institutions responsible for implementation. Additionally, ESMPs will outline phased implementation schedules, cost estimates, and funding sources for mitigation activities, monitoring, and capacity building. E&S Specialists from the PIUs will oversee enforcement, monitoring, and compliance during the construction phase (from contract award through the start of work). The Department of Environment (DOE) and Department of Irrigation (DOI) will oversee these responsibilities during the project's operation and maintenance phase.

4.1. Financial Intermediaries

Under Sub-component 1.2, one or more Financial Intermediaries (FIs) will be engaged to channel project funds to small and medium industries for the replacement of inefficient boilers and furnaces with cleaner technologies. To facilitate this process, a consulting firm or individual consultants will be hired under the PIU-MOICS to support interested industries in preparing funding application packages. These packages will include all necessary application documents, including environmental and social (E&S) documentation. Consultants will conduct initial E&S screening of proposed subprojects using criteria outlined in Annex-2 of the ESMF to exclude high-risk or non-eligible activities. Eligible subprojects will then receive support in preparing site-specific instruments such as Environmental and Social Management Plans (ESMPs) and Labor Management Procedures (LMPs), as needed based on the outcomes of the E&S screening. The funding application package, including E&S documents, will then be submitted to an FI to determine eligibility and receive funding.

All FIs are required to have a functioning Environmental and Social Management system that is aligned with the project ESMF and the World Bank's Environmental and Social Framework (ESF). The Banks in Nepal follow Nepal Rastra Bank's Environmental and Social Risk Management (ESRM) Guidelines (February 2022). The banks are encouraged to adopt sustainable banking practices. These include a better management of E&S risks in the transactions they finance. The Guidelines require that Financial

Intermediaries have an Environmental and Social Management System (ESMS) compliant with the local environmental and social laws and regulations. Overtime they are encouraged to comply with the International standards and IFC Performance Standards on Environmental and Social Sustainability and Equator Principles.

During the project preparation, the Rastiriya Banijya Bank (RBB) has been identified as a Handling Bank for the project. The Handling Bank will be responsible to provide financial, administrative, and monitoring support to the PIU at MOICS. The RBB has a robust ESMS that adheres to the national laws and regulations, and international best practices. However, there are gaps between the national requirements and the WB ESF. Most of these gaps are in the areas of regulation enforcment, monitoring, labor management, OHS, and waste management, as well as consultations and information disclosure. Before the RBB receives the funds for carrying out the project activities, the RBB will need to address these gaps in its ESMS to make it compliant with the WB ESF requirements.

The RBB will on-lend to FIs found eligible to participate in the Project. One of the eligibility criteria for the FI's participation is an operational ESMS. The gaps in the ESMS will need to be addressed and ESMS aligned with the WB ESF before funds are transferred to the Fis. During loan appraisal for the participating enterprises, the FIs will utilize their ESMS to determine eligibility of enterprises for funding. They will also conduct an independent review using the E&S checklist provided in Annex-6 to verify ESMF compliance, the completeness of required E&S instruments, and the status of regulatory approvals such as BES & IEE etc. FIs will also assess whether appropriate risk mitigation and monitoring measures are in place. All E&S-related assessments and decisions will be properly documented, and the FIs will carry out regular monitoring throughout project implementation, using the monitoring checklist in Annex-7, to ensure that financed enterprises maintain compliance with their E&S obligations.

5. STAKEHOLDER ENGAGEMENT AND GRIEVANCE REDRESS MECHANISM

A standalone Stakeholder Engagement Plan (SEP) has been prepared for the project in compliance with the World Bank's ESS10. The SEP has defined and categorized project stakeholders to help analyse various groups, to consider their interest in the project, and to identify the most effective and appropriate forms of communication and engagement with those groups, so that engagement can be tailored to these groups. In addition, specific and targeted approaches are adopted in the SEP to ensure that poor and vulnerable marginalized groups which include women, indigenous people, Dalits, Madhesis have meaningful participation in the decision-making process, and in design and implementation of the activities.

A project-specific Grievance Redress Mechanism (GRM), managed by each of the PIUs, will be in place to address stakeholder concerns promptly and effectively, including provisions for escalating unresolved issues and managing cases of sexual exploitation and abuse or sexual harassment (SEA/SH) through a specialized survivor-centric approach. Participating Financial Intermediaries (FI) of the project will also be required to maintain GRM systems in consistent with the project's framework. The existence of the GRM will not impede, but rather build on the existing GRM at Ministry of Industry, Commerce and Supplies

(MoICS), and DoE for uptake of project related grievances access, and also the judicial and administrative remedies for the complainant.

6. PROJECT IMPLEMENTATION ARRANGEMENTS, RESPONSIBILITIES, AND CAPACITY BUILDING

The Environmental and Social (E&S) risk management will be integrated into the proposed Project Implementation Units (PIUs) at the MoICS and the DoE. PIU-MoICS will have one Environmental Specialist and one Social Development Specialist and PIU-DoE will have one Environmental and Social Specialist. The PIU- MoICS will handle Component 1, while the PIU-DoE will manage Component 2. Activities under Component 1 (specifically sub-component 1.2) will be implemented through several Financial Intermediary (FI).

The E&S Specialists at PIU-MoICS will coordinate with the selected FI(s) to effectively manage environmental and social risks under Component 1. The FI will maintain an Environmental and Social Management System (ESMS) to manage these risks, with support from PIU-MoICS specialists. The FIs will conduct E&S screening for each sub-project as per ESMS requirements.

Training sessions on the World Bank's ESSs will be provided to the specialists at the PIUs and FI. These sessions will cover topics such as implementing the ESMF, SEP, Labor Management Procedures (LMP), monitoring and reporting, meaningful stakeholder engagement, using the grievance redress mechanism, and stakeholder consultations. Additionally, project contractors and their workforce will receive training on complying with the ESMF and basic Occupational Health and Safety measures.

Each PIU (PIU-MoICS and PIU-DoE) will conduct compliance monitoring and will prepare comprehensive quarterly monitoring reports for submission to the World Bank.

These quarterly reports will detail the project's performance regarding environmental, health, and safety (ESHS) aspects. Specifically, the reports will cover progress in implementing the ESCP, the preparation and execution of required environmental and social documents outlined in the ESCP and/or ESMF, stakeholder engagement activities, and the functionality of grievance mechanisms.

Additionally, external or third-party ESMF monitoring will be carried out twice during the project lifecycle: at the mid-term review stage and in the final year of implementation. This external monitoring aims to verify that all environmental and social issues are effectively addressed and that mitigation measures comply with the provisions specified in the ESMF.

7. COSTS OF ESMF IMPLEMENTATION

The total estimated budget for implementing the ESMF is NPR 109.9.million. This amount will cover expenses related to specific ESMF activities, including the recruitment of environmental and social specialists, capacity building initiatives, stakeholder engagement activities, grievance redress mechanism

implementation, field monitoring, and associated mitigation measures. Costs related to mitigation actions identified in sub-projects will be accounted for separately within the budgets of their respective ESMPs.

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ABBREVIATIONS AND ACRONYMS

BES	Brief Environmental Study
CAP	Clean Air and Prosperity
CBOs	Community-based organizations
CoC	Code of Conduct
CSO	Civil Society Organization
DoE	Department of Environment
DoI	Department of Industry
DoLOS	Department of Labour and Occupational Safety
E&S	Environmental and Social
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EPA	Environmental Protection Act
EPR	Environmental Protection Regulation
ESCP	Environmental and Social Commitment Plan
ESCOP	Environmental and Social Code of Practice
ESF	Environmental and Social Framework
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESRS	Environmental and Social Review Summary
ESS	Environmental and Social Standards
FI	Financial Intermediary
GBV	Gender Based Violence
GESI	Gender Equality and Social Inclusion
GoN	Government of Nepal
GRM	Grievance Redress Mechanism
HB	Handling Bank

IEE	Initial Environmental Examination
LMP	Labor Management Procedure
M&E	Monitoring and Evaluation
MoFE	Ministry of Forest and Environment
MoICS	Ministry of Industry, Commerce and Supply
NAQMAP	National Air Quality Management Action Plan/
NEFIN	National Federation of Indigenous Nationalities
NFDIN	National Foundation for Development of Indigenous Nationalities (Nepal)
NGO	Non-Governmental Organization
NRB	Nepal Rastra Bank
OHS	Occupational Health and Safety
PBC	Performance Based Condition
PFI	Partner Financial Institution
PIU	Project Implementation Unit
PPE	Personal Protective equipment
PSC	Project Steering Committee
SEA	Sexual Exploitation and Abuse
SEP	Stakeholder Engagement Plan
SH	Sexual Harassment
ToR	Terms of Reference
WB	World Bank
WHO	World Health Organization

1. INTRODUCTION

The Indo-Gangetic Plains and Himalayan Foothills (IGP-HF) region, which Nepal shares with Bangladesh, India, and Pakistan, has the world's worst air pollution. More than 90 percent of the population of these four countries is regularly exposed to hazardous levels of air pollution.[3] In Nepal's two pollution hotspots, Kathmandu valley and Terai, much of the air pollution is also from across the border. In the Kathmandu Valley, about a quarter of the air pollution comes from outside of the valley (and more than half of that comes from outside of the country), and in the Terai, two-thirds of the pollution comes from outside of the country.[4]

In Kathmandu Valley and the Terai, which border India,[5] annual average $PM_{2.5}$ exposure reaches 39 and 37 µg/m³, which is seven to eight times higher than the World Health Organization (WHO) guideline value of 5 µg/m³. Air pollution is the number one risk factor for mortality in Nepal, even ahead of malnutrition and tobacco. It shortens the average life expectancy in Nepali by more than three years, and lead to almost 26,000 premature deaths each year.[6] Beyond health impacts, poor air quality leads to reduced labor productivity and negatively impacts tourism (lower visibility of the Himalayas and cancelled flights).[7] Overall, poor air quality is estimated to cost more than 6 percent of Nepal's GDP each year.[8]

Nepal's air pollution comes mainly from three local sources—boilers, cookstoves and motor vehicles—and is expected to further deteriorate without targeted action.[9]As air pollution within the broader IGF-HF airshed reflects a mix of sources, 17 percent of Kathmandu Valley's air pollution is contributed by sources from outside of the Valley (more than half of which from neighbouring countries). Of the main local sources of air pollution, emission from boilers operating on fossil fuel and rice husk are expected to become the number one source by 2035. Industries are among the major local sources of air pollution in the Terai, along with cooking, agriculture, and transportation, and about two-thirds of this high-level air pollution comes from outside the country.

Nepal's industrial sector is largely reliant on coal, diesel, and furnace oil combustion, leading to the release of both air pollutants (such as particulate matter (PM), sulfur dioxide, and nitrogen oxides), climate pollutants (such as GHGs and black carbon). Recognizing such negative impacts, the GoN aims to reduce industrial reliance on coal, diesel, and heavy fuel oils, replacing them with electricity

[3] Hazardous levels are levels greater than 35 micrograms of fine particulate matter per cubic meter of air (35 µg/m³ of $PM_{2.5}$). Fine particulate matter of such concentration is the most critical air pollutant to human health ("Detox Development: Repurposing Environmentally Harmful Subsidies," World Bank 2023).

[4] "Towards Clean Air in Nepal: Benefits, Pollution Sources and Solutions," World Bank (2025).

[5] "Towards Clean Air in Nepal: Benefits, Pollution Sources and Solutions," World Bank (2025).

[6] World Bank 2019. "Nepal Country Environmental Analysis," World Bank.

[7] Kathayat, Bhogendra & Panday, Arnico & Pokharel, Binod & Chapagain, Narayan. (2024). intensifying haze and disappearing dense dog in winter at Tribhuvan International Airport, Kathmandu: Impacts in aviation. Journal of Institute of Science and Technology. 29. 35-45. 10.3126/jist.v29i1.56933.

[8] "Nepal Country Environmental Analysis," World Bank 2019. This target also closely matches the World Bank's Corporate Scorecard Indicator (Client Context Indicator), which is reducing the number of people exposed to hazardous air pollution (also defined as 35 µg/m³).

[9] By 2035, air pollution is expected to deteriorate, due to economic development (mostly attributable to higher energy use and motorized mobility). The baseline is expected to shift to an exposure of Kathmandu Valley (52 µg/m³) and in Terai (42 µg/m³) ("Towards Clean Air in Nepal: Sources and Solutions," World Bank [forthcoming]).

produced by domestic renewables.

In this regard, The Government of Nepal (GoN), Ministry of Forest and Environment (MoFE) and Ministry of Industry Commerce and Supply (MoICS) with support from the World Bank, is implementing the Nepal Clean Air for Prosperity (CAP) Project to address severe air pollution in the Kathmandu Valley and Terai region.

This report provides an assessment of the environmental and social risks and impacts associated with the project, and based on the assessment, identifies project design-related risk mitigation measures, and develops a framework for managing the project's risks and impacts during implementation. The scope of the assessment and framework will cover seven (ESS1, 2, 3, 4, 7, 9 and 10) of the World Bank's Environmental and Social Standards (ESS) listed in Table 4-1.

2. PROJECT DESCRIPTION

The Nepal CAP Project focuses on Kathmandu Valley and the Terai region to reduce PM2.5 emissions from key sources and enhance air quality management across Nepal. The project focuses on cost-effective emission reductions from key industrial sources that significantly impact public health. Additionally, it aims to enhance air quality monitoring, governance, and enforcement nationwide. The CAP Project's primary objectives are to (1) accelerate and cost-effectively reduce emissions from targeted industrial and commercial sources that are primary contributors to air pollution in the Kathmandu Valley and Terai region and (2) strengthen air quality monitoring, governance, and enforcement in the country.

2.1. Project Components

The project will have the following four core components:

Component 1: Adopting cleaner production technologies to reduce $PM_{2.5}$ emissions: Component-1 will support enterprises (industrial and commercial) to adopt cleaner technologies, including boilers and furnaces operating on cleaner fuels. The project will focus predominately on small and medium enterprises (SMEs) that operate boilers and furnaces using fossil fuels (coal, diesel, and oil), as well as inefficient boilers and furnaces using biomass. The clean technology adoption survey carried out during the project preparation identified food and beverage, textile, chemical, pharmaceutical, steel, hospitality, and hospitals as the main category of industries that operate boilers. The project will target these industries, in addition to the other industries that operate boilers on fossil fuels.

The project aims to support SMEs in adopting cleaner production (combustion) technologies through three distinct interventions: 1. Support switching to electric boilers and furnaces, either by replacing an existing boiler or installation of a new one; 2. Support enterprises that are unable to convert to electric boilers, to adopt pellet boilers or furnaces, either through new installation or retrofitting existing equipment with necessary modifications to the heating systems, fuel handling and loading mechanisms and efficient emission control devices; and 3. Support the installation of efficient emission control devices (bag filters, wet scrubbers, etc.) in industries that could not convert to electric boilers or pellet boilers (due to technical and/or financial constraints). The project will not support cyclone

separators/filters (currently the most common emission control system for biomass and wood-fired boilers), which have proven to be ineffective in reducing PM2.5.

Component 1 has three sub-components: 1.1: Building MSME readiness for clean technology adoption through comprehensive knowledge, awareness and technical support to help selected enterprises identify, install, and operate cleaner technologies and fuels, and secure financing provided under Subcomponent 1.2. This will support enterprises to conduct technical and financial viability studies and prepare Detailed Project Reports for the conversion of boilers to operate on cleaner fuels. Comprehensive training and capacity building programs for the staff of implementing agencies and other stakeholders, including boiler operating enterprises and technology providers, will also be carried out through this subcomponent.

1.2. Financial Incentives provided through a dedicated financing mechanism to promote cleaner technologies and fuels. This subcomponent will provide financial incentives to eligible enterprises through Financial Intermediaries (FIs), supporting their transition to cleaner technologies. All three technology options; electric boilers/furnaces, pellet-based systems, and emissions-control equipment; will be financed at market interest rates but with extended repayment periods. A dedicated financing mechanism will be established under this subcomponent, involving a Handling Bank (HB) and multiple Participating Financial Institutions (PFIs), operating under the oversight of Nepal Rastra Bank (NRB)

1.3. Supporting the policy, monitoring, and enforcement for industrial pollution abatement. This subcomponent will establish a comprehensive monitoring and verification system led by Department of Industry(DoI) and Department of Labour and Occupational Safety (DoLOS) to ensure the successful adoption and proper functioning of cleaner technologies in enterprises. This subcomponent will also finance two Performance-Based Conditions (PBC). The first PBC (PBC-1) will allow industries to claim terminal depreciation on replaced fossil fuel boilers and furnaces, eliminating tax liability and freeing up cash for clean technology investments. The second PBC (PBC-2) will support the introduction of 20 percent rebate on applicable corporate income tax for five years for firms installing clean technology equipment, directly reducing tax liability and boosting profitability to incentivize cleaner technology solutions.

Component 2: Strengthening air quality monitoring, policy setting, enforcement capacity, and regional cooperation: Component-2 will will strengthen the GoN's air quality management by reinforcing regulatory foundations, enhancing institutional capacity for enforcement, and improving monitoring of existing pollution sources.

Component 2 has three sub-components: 2.1 Strengthen ambient air quality management through enhanced monitoring and enforcement[10] including construction and instrumentation of the central environmental laboratory 2.2 Strengthening governance, regulatory reform, policies and enforcement that includes assessment of policies critical to implementation of National Air Quality Management Action Plan (NAQMAP), strengthening emission standards and enforcement capacity. , and 2.3 National and regional AQM planning, coordination, partnership and policy assessment.

[10] Strengthening 30 existing air quality monitoring stations in Nepal, through installing power supply and communication infrastructure and upgrading an adequate number of stations to monitor additional pollutants, such as black carbon dioxide(BC), Sulfur Dioxide (SO2), Nitrogen Oxide (NOX), and Ozone (O3). This will also include expanding up to five new AQM monitoring stations to ensure equitable coverage of the monitoring network depending on population exposure, industrial concentration, trans boundary air pollution etc.

The sub-component 2.1 will support two Performance-Based Conditions (PBC). The PBC-3 will support in strengthening emission standard compliance by industrial establishments with installation and operation of effective air pollution control devices and chimney height requirements. These standards reduce air pollution from biomass and fossil fuel-based boilers and furnaces while requiring firms to internalize pollution control costs, making cleaner alternatives more economically attractive. The PBC-4 will support DoE officials and provincial environmental inspectors in strengthening enforcement, monitoring and inspection capacity of industries in critical sectors such as food and beverage, textile, chemical, pharmaceutical, steel, hospitality, and hospitals.

Component 3. Project management, monitoring, and capacity building. This component will support the establishment of the Project Implementation Units (PIUs) at MoICS and DoE, respectively. This component will finance the costs associated with the key project staff, day-to-day-functioning of the PIUs, office set up and equipment, and other project costs. In addition, this component will also finance consultancies/service-providers to support day-to-day implementation of the project activities, coordination and monitoring and evaluation..

Component 4. Contingency emergency response component (CERC). The CERC is one of the Bank's contingent financing mechanisms available to governments to gain rapid access to Bank financing to respond to a crisis or emergency. Following an eligible crisis or emergency, the Borrower may request the Bank to re-allocate project funds to support emergency response and reconstruction. This component would draw from the uncommitted credit resources under the project from other project components to cover emergency response. The E&S risks under CERC will not be covered under this ESMF. Separate CERC E&S documents will be prepared in line with the CERC Manual. A CERC Manual and Emergency Action Plan will detail out the provisions for activating and implementing CERC, including operational, fiduciary and technical detail.

2.2. Rationale and Objective of the ESMF

Projects supported by the World Bank through Investment Project Financing are prepared in compliance with the World Bank's Environmental and Social Standards (ESSs) for the management of environmental and social risks and impacts. The ESMF has been prepared to assist in screening, assessment, management of environmental and social risks of the project from an early stage in project planning and to integrate mitigation measures during the design of project activities and their implementation. The ESMF provides specific guidance on the policies and procedures to be followed for environmental and social assessment along with roles and responsibilities of the various implementing agencies. The ESMF describes the procedures for the assessment and management of the environmental & social risks and impacts associated with the project activities with the following objectives:

- Set out the principles, rules, guidelines, procedures and methods to assess the environmental and social risks and impacts of the project
- Provide guidance/solutions on the implementation of the environmental and social management measures and provide a plan for monitoring the implementation of environmental and social standards
- Specify institutional arrangements, including appropriate roles and responsibilities for managing, reporting and monitoring environmental and social concerns of the project activities
- Provide guidance and strategy for stakeholder engagement for the identification and management of the environmental & social issues, impacts, and risks associated with the project; and,

- Determine the other institutional requirements, including plans for training and capacity building of key stakeholders needed to successfully implement the provisions of the ESMF.

The implementation of the ESMF will facilitate compliance with the World Bank's ESSs and national requirements to address the associated risk and impacts of the project.

In addition to this ESMF, a standalone Stakeholder Engagement Plan (SEP) and a standalone Labor Management Procedure (LMP) have also been developed. The SEP outlines how the project will conduct meaningful consultations with stakeholders throughout its lifecycle. The LMP details the project's approach to manage and mitigate labor-related relations, risks and impacts in accordance with national legislation and the World Bank's ESF. Additionally, the project will develop an Environmental and Social Commitment Plan (ESCP), which outlines the measures and actions the Borrower must undertake to comply with the World Bank's Environmental and Social Standards (ESSs). The ESCP is a legally binding agreement between the Government of Nepal (GoN) and the World Bank.

3. APPROACH AND METHODOLOGY

The Environmental and Social Management Framework (ESMF) was prepared consisting the steps mentioned below:

- **Document review and baseline analysis**: Project proposals and concept papers were reviewed to clarify the project's scope, objectives, and planned activities. Secondary baseline data on the project's physical, biological, socioeconomic, and cultural conditions were gathered from published reports, peer reviewed studies, and government databases. The analysis also included a policy and regulatory gap assessment, comparing national environmental and social (E&S) requirements, the Environmental Protection Act 2019 (EPA), the Environmental Protection Regulation 2020 (EPR), and related provisions, with the World Bank ESF and its Environment and Social Standards(ESSs) to identify areas of alignment and any additional compliance needs.

- **Stakeholder consultations:** throughout project preparation, there were extensive discussions with the Ministry of Industry, Commerce and Supplies (MoICS), the Department of Environment (DoE), the World Bank task team and potential small and medium enterprises (SMEs) to clarify the proposed interventions and their likely geographic scope, noting that specific sub-project sites and SMEs have not yet been finalized. There are consultations with the female-owned enterprises in Nepal. The E&S documents prepared for the project have been discussed with different stakeholders as part of the project preparation. There are two sets of formal consultations when the ESMF was finalized organized by the MoICS and DoE. The Project will continue engaging with stakeholders in line with the SEP throughout the project preparation.

- **Scoping, assessment and framework preparation:** Building on the information gathered, an initial scoping and screening exercise identified the key ES parameters likely to be affected. The findings of the E&S assessment were consolidated into the ESMF, along with management procedures aligned with the EPA 2019, EPR 2020, other national E&S requirements, and the World Bank ESF.

3.1. Limitation

Because the specific sub-project sites and individual SMEs had not yet been identified, the team was unable to conduct detailed data collection or field-level verification of environmental and social parameters while preparing this ESMF. Therefore, the analysis relies on conversations with government officials, discussions with prospective SME representatives, and secondary sources (e.g., published reports, peer reviewed studies, and government databases). The ESMF will be revised during implementation as the project evolves, as needed

4. LEGAL, REGULATORY AND POLICY FRAMEWORK

Specific national and international regulatory frameworks related to the assessment and management of environmental and social impacts of the project are reviewed along with directives and guidelines issued by the GoN.

4.1. Relevant National Laws and Policies

Laws and regulations relevant for environmental and social management under the Project are listed below. Discussion on the relevancy of the listed regulatory framework to NCAP is provided in Annex-5.

List of National Laws and Regulations

Constitution of Nepal 2015
Environmental Protection Act 2019
Environmental Protection Rules 2020
National Environment Policy 2019
Climate Change Policy 2019
Local Government Operation Act 2017
Solid Waste Management Act 2011
Labor Act 2017
Social Security Act 2018
Social Security Regulation 2018
Public Health Service Act 2018
Public Health Service Regulations 2020
Nepal Sixteenth Five Year Plan 2019/20-2023/24
Gender Equality and Social Inclusion Strategy 2021
Permissible Exposure Limit (PEL) of Noise for Workplace 2017
Brick Industry Smoke Emissions and Chimney Height Standards 2018
Industrial Boilers Smoke Emission and Chimney Height Standards 2012
National Ambient Air Quality Standards (NAAQS) 2012
Child Labor (Prohibition & Regulation) Act 2000
National Foundation for Development of Indigenous Nationalities Act 2002

4.2. Provisions of E&S Standards of the World Bank

This ESMF has been prepared in accordance with the provisions of the ESF. The ESF includes ten Environmental and Social Standards (ESS) that set out the requirements for Borrowers relating to the identification and assessment of environmental and social risks and impacts associated with projects supported by the Bank through Investment Project Financing. Out of the ten standards, seven standards are applicable to this project. Table 4-1 outlines the applicability and overview of the relevance of the ESSs for the project. Gap analysis and measures to bridge the gaps between the ESSs and GoN policy and legal requirements for environmental and social risk management related to this project are included in *Annex 5*.

Table 4-1 Applicability of the relevant ESSs for the project

WB ESS	Relevancy	Relevance of the ESS to the project activities	Addressing the ESS
ESS 1: Assessment and management of environmental and social risks and impacts	Relevant	Project activities include civil works, boiler/furnace/kilns replacement and E&S risks, and impacts are expected. Environmental risks of air and water pollution and demolition waste and refractories waste generation are anticipated. The potential impacts anticipated will be occupational health and safety (OH&S) of workers, the generation of construction, demolition and refractories waste, dust and noise pollution and other nuances during civil works.	An Environmental and Social Management Framework has been drafted to provide procedures in addressing and mitigating these risks. The ESMF will guide the further E&S screening and assessment of the sub project level activities including the National requirements.
ESS 2: Labor and working conditions	Relevant	labor influx is not expected, and given the nature of work, the majority of workers are likely to be already engaged for industry operation in Component 1. The labor required for boiler replacement and AQMS upgrading and expansion will require small nos. of labor for limited time period. Potential associated labor risks include non-payment of wages and benefits, discriminatory employment practices, OH&S issues including clearing of construction, demolition and refractory waste, workplace accidents, grievances amongst the workers, and SEA/SH including risks associated works.	Labor management Procedure (LMP) incorporating aspects of National Labor Act 2074 and Labor Rules, 2075 and, non-discrimination and equal opportunity, grievance mechanism to all workers, OHS protocols
ESS 3: Resource efficiency and pollution prevention and management	Relevant	The project will support activities which may potentially cause pollution to air and water and some of which may involve use of chemicals. The project activities related to adverse environmental impacts in the form of effluent and solid waste state are likely due to inefficient use of and unmanaged disposal of waste from construction, demolition and refractory waste and the effluent containing cleaning (solution	The ESMF includes sections on Pollution Prevention and Management with a focus on those issues which might arise while carrying out project activities. Relevant measures, including for impacts deriving from the disposal construction, demolition and refractory waste will be integrated into ESMPs.

WB ESS	Relevancy	Relevance of the ESS to the project activities	Addressing the ESS
		containing of detergent/chemical) of all industrial facilities including offices, accommodation, canteens, common spaces for Component 1. Possible issues from generation and management of e-waste from ICT and AQMS equipment.	
ESS 4: Community health and safety	Relevant	Boiler/furnaces replacement will be done in-situ, however, areas adjacent to enterprises may be used for storage and transportation. Hence, there may be potential some limited impact on communities and surrounding area Impacts include noise and dust pollution, disturbances from construction vibrations.	The ESMF includes the assessment of risks and impacts to the community such as excessive construction noise and dust levels, site safety awareness, and access restrictions and mitigation measures by adopting adequate OHS and community health and safety protocols for WBG EHS Guidelines. It also includes a detailed SEA/SH outlining potential risks and specific mitigation measures during different stages of the project.
ESS5: Land acquisition, restrictions on land use and involuntary resettlement	Not Relevant	The project does not include activities that would require land acquisition, leading to the physical or economic displacement of the people. Since upgrading and improvement works for Component 1 will take place on existing premises of SMEs and civil works may require some temporary displacement to establish work areas for carrying out construction activities. Upgrading and expansion of AQMS under Component 2 is expected to be within the government ownership land.	N/A
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	Not Relevant	This ESS is not expected to be relevant because the project activities, will be constructed in existing premises and is not anticipated to affect or involve any impacts on biodiversity or natural resources.	N/A
ESS 7: Indigenous Peoples/Sub-	Relevant	Nepal is culturally diverse country, hosting multiple ethnic groups including 60 indigenous groups or	SEP provides specific measures to ensure there is meaningful consultation with representative institutions of

WB ESS	Relevancy	Relevance of the ESS to the project activities	Addressing the ESS
Saharan African Historically Underserved Traditional Local Communities		nationalities across all provinces. Of the total population, the indigenous people account for about 37 percent. The project activities will take place within Kathmandu and the Terai region. The project is unlikely to pose adverse impacts to indigenous people as the project doesn't aim to acquire or put the restriction in the use of land or take land on a lease that belongs to indigenous peoples for the project activities. However, the presence of IPs and IP-owned enterprises, including those employing IP workers, cannot be ruled out. Therefore, there is a possibility of the exclusion of IPs from the project's benefits. .	relevant affected indigenous peoples at different levels and to ensure they are not deprived of opportunities offered by the project. The SEP incorporates culturally informed approaches to communication, consultation and information sharing. Additional measures will also be considered once the presence of IPs in the project areas is confirmed
ESS8: Cultural Heritage	Not Currently Relevant	Given the project will support the improvement of existing facilities, it is not expected that existing cultural heritage will require removal or relocation, nor that there will be any other adverse impacts on cultural heritage.	N/A
ESS9: Financial Intermediaries (FIs)	Relevant	Component 1 will utilize Financial intermediary (FIs) for the channelling of project funds to the industries, for establishment or improvement of targeted industries/enterprises in adopting clean technology	An environmental and social capacity assessment of these financial intermediaries will be carried out. If any gaps are identified in the FI ESMS, these gaps will be addressed and ESMS strengthened in line with the ESF Clearly defined procedures for the identification, assessment, management and monitoring of the environmental and social risks and impacts of activities covered the project will be set and maintained in ESMS.
ESS 10: Stakeholder Engagement and Information Disclosure	Relevant	The project will ensure that it will adopt a consistent, comprehensive, coordinated, and culturally appropriate approach for engaging stakeholders and disclosing project related information.	The project has prepared a Stakeholder Engagement Plan (SEP) to ensure that stakeholder engagement activities are effective and meaningful consultation is carried out including guideline for establishing a clear, safe and accessible procedures to identify and respond to

WB ESS	Relevancy	Relevance of the ESS to the project activities	Addressing the ESS
			project related grievances (including related to E&S, SEA/SH, etc).

5. ENVIRONMENTAL AND SOCIAL BASELINE

5.1. Background

Air pollution in Nepal and South Asia has reached critical levels, posing severe risks to public health, economic productivity, and environmental well-being. Nepal's primary pollution sources include outdated boilers, traditional cook stoves, and motor vehicles, with Kathmandu and the Terai region being the most affected areas. Industrial sectors such as cement, brick, and steel manufacturing further worsen the problem due to their reliance on coal and biomass fuels. Notably, nine of the world's most polluted cities are in South Asia, with Kathmandu frequently ranking among the worst. The average PM2.5 concentration in Kathmandu Valley reached 88 micrograms per cubic meter in 2019, far exceeding the WHO's safe limit of 5 micrograms[11] . Transitioning to cleaner technologies remains a challenge due to high costs, lack of access to renewable fuels, and technical barriers.

This project aligns with Nepal's national environmental policies and its COP26 commitment to achieving net-zero emissions by 2045 while increasing clean energy use to 15% of total energy demand. It also supports the World Bank's regional air quality initiatives and directly contributes to Sustainable Development Goals (SDGs) 3 (good health and well-being), 7 (affordable and clean energy), and 13 (climate action). By assessing current industrial systems and proposing feasible cleaner production solutions, the project aims to reduce emissions and mitigate environmental impacts in Kathmandu Valley and the Terai region. The following paragraphs briefly present the baseline information mainly drawn from secondary data.

5.2. Industries in Nepal

The industrial enterprise act, 2020 has classified industries based on the fixed capital into micro-industry, small industry, medium industry and large industry. Depending on the goods and services produced from such industries the industries are categorized into Agro and Forestry Based, Energy Based, ICT Based, Infrastructure, Manufacturing, Mineral, Service and Tourism in Nepal. Till fiscal year 2023/24, a total of 9,519 industries (1419 large, 2139 medium and 5961 small) are being operated providing direct employment to 705,878 population[12]**.**

Sectoral Industries: An assessment of boiler systems in the heat intensive industries of Nepal[13] was carried out across seven specific sectors in Kathmandu and Terai. The sectors included are Food & Beverage, Chemical, Pharmaceutical, Textile, Hospitality, Plywood, Feed, and Hospitals (refer figure 5-1 for sector wise distribution). These sectors were strategically chosen due to their significant use of steam boilers in their operations, which are critical for processes such as sterilization, heating, drying, and other energy-intensive activities. The data encompasses a total of 2497 registered industries among the mentioned sectors across the selected districts.

[11] Assessment of boiler systems in heat intensive industries of Nepal, January 2025.
[12] GoN, MOICS, DOI, 2023/24. Industrial Statistics
[13] Assessment of boiler systems in heat intensive industries of Nepal, January 2025.

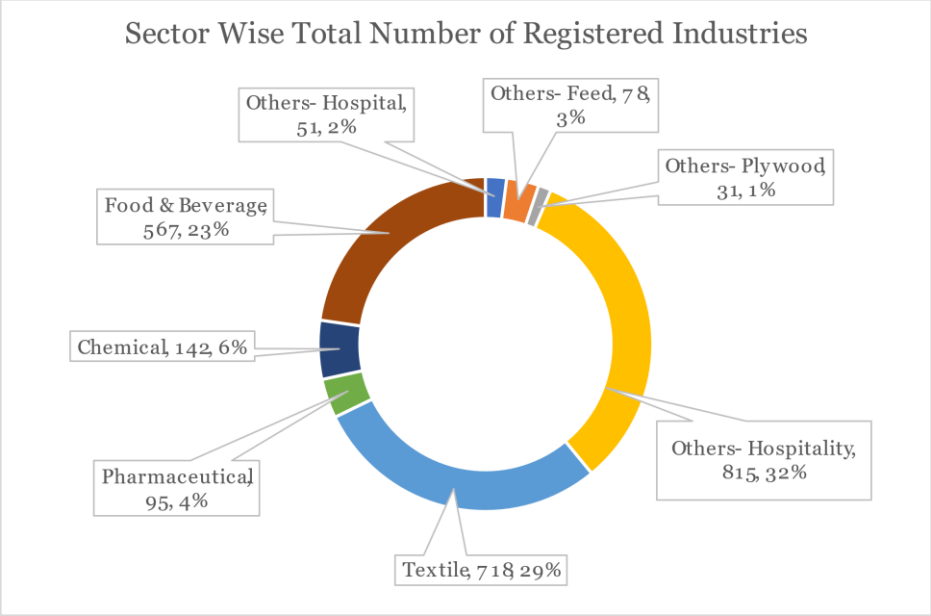

Figure 5-1: Sector Wise Total Number of Registered Industries

The sector-wise distribution of the aforementioned industries registered across Nepal reveals key trends and concentrations of industrial activity. The Kathmandu Valley has the highest number of industries, including 633 in the hospitality sector, 614 in textiles, and 30 in healthcare. Meanwhile, the food & beverage, chemical, pharmaceutical, and plywood industries are more evenly distributed across various Terai districts, primarily in Jhapa, Morang, Bara, Chitwan, and Rupandehi[14].

Industries with Boilers: In Nepal, a total of 1,063 industries among the 9,519 industries are with boilers/furnaces/kilns (Unpublished report of MoICS). Industries that are with various capacity of boilers/furnace/kilns included Agro based, Food processing, Brick, Ceramics, Beverage, Chemical, Pharmaceutical, Steel, Textile and Carpet, Refineries, Hospital, Hotel, Animal Feed, Paper, Plywood industries (Please refer to Figure 5-2 for a breakdown of the numbers by industry type using boilers).

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[14] Assessment of boiler systems in heat intensive industries of Nepal, January 2025.

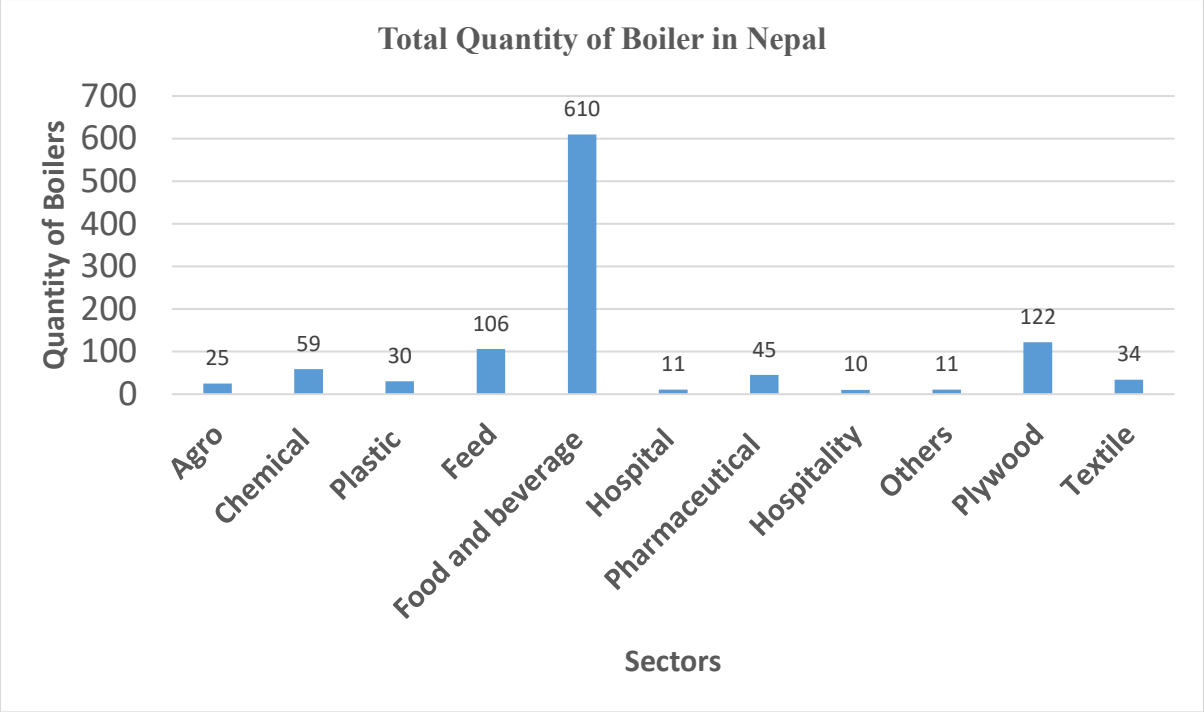

Figure 5-2: Total Quantity of Boilers in Nepal

The distribution of boilers based on fuel type: The distribution of boilers based on fuel type reveals significant variation in the usage of different fuel sources. 68% of firms use polluting biomass (firewood and rice husks), whereas biomass briquettes are used by 0.38% only (please refer figure 5-3 for details). In terms of daily use trends also, rise husk, wood logs and wood chips account of 8,970 metric tons daily, while biomass briquettes account for just 47 metric tons per day only. This data underscores the industry's heavy reliance on rice husk and wood logs as the primary fuel sources in Nepal[15].

[15] Assessment of boiler systems in heat intensive industries of Nepal, January 2025.

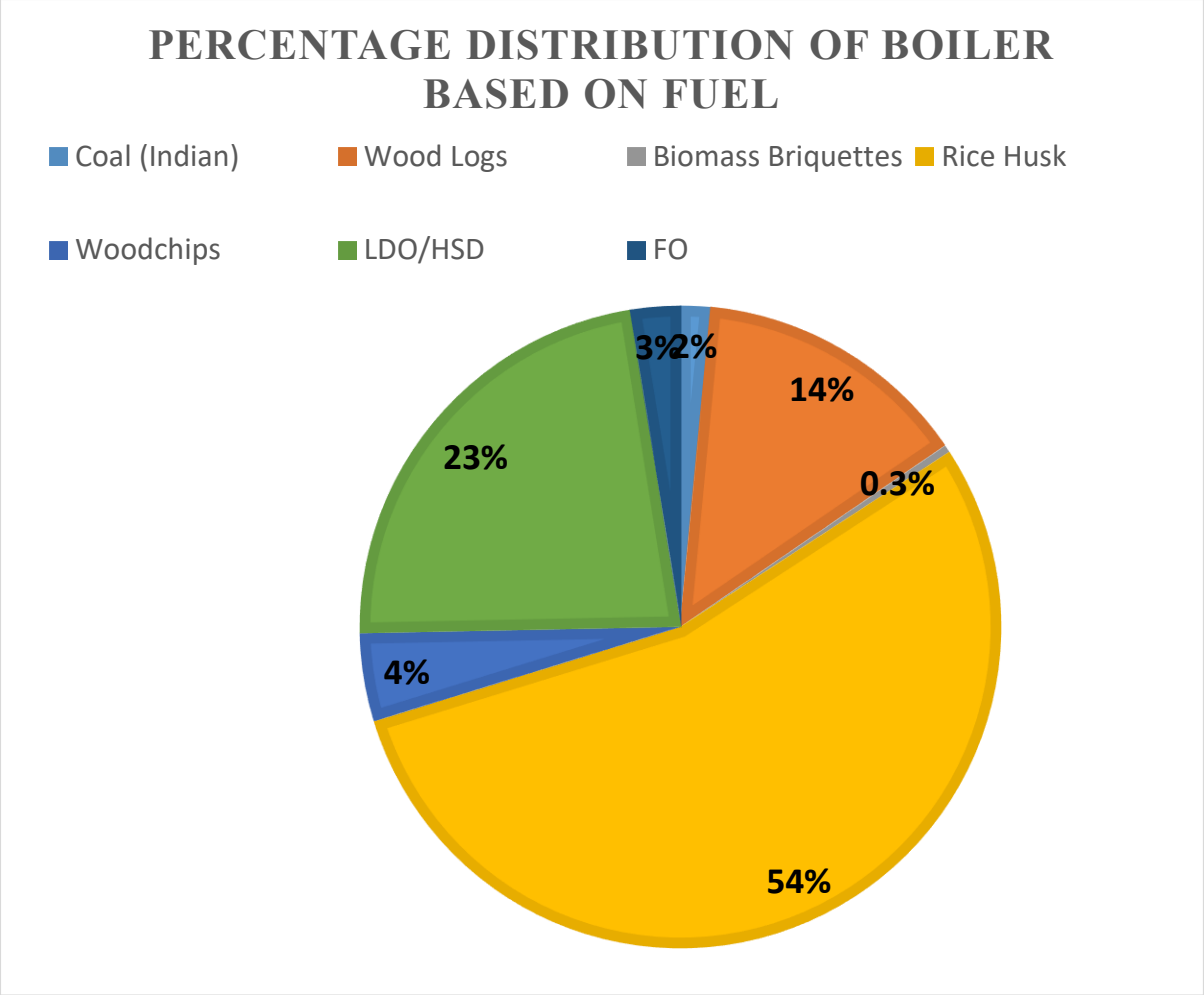

Figure 5-3: Percentage Distribution of Boiler Based on Fuel

Among the 61 boiler installed industries participated in the World Bank Cleaner Boiler Adoption Survey, 2025, 56% were food and beverage manufacturing industries followed by Tobacco industries at 10%. Boilers distribution among the surveyed industries indicates a mix of new (0-5 years) and old (16+) systems, with an average age of 12.9 years and are relatively small operated mostly in the 0-5 tons/hour range, with an average of 2.8 tons/hour. Furnaces are generally older, with an average of 15.6 years and have a higher average capacity (6.7 tons/hour), with those in Ceramic industries reaching 20 tons/hour. Most industries operate their boilers and furnaces between 8-16 hours/day and 200-300 days/year and are operated mostly by biomass fuels such as firewood. Among these 61 industries, just over 70% have air pollution control devices are installed and 75% of the surveyed industries are willing to switch to cleaner fuels.

Willingness to adopt cleaner technologies: Out of the 1,063 Nepali industries that currently rely on boilers and furnaces, Component 1 aims to help approximately 400 facilities in the Kathmandu and Terai regions to shift from traditional biomass fed systems to cleaner electric and pellet based alternatives, a transition expected to yield long term gains in air quality, environmental performance, and public health. The World Bank's Cleaner Boiler Adoption Survey (2025) of 61 industries found

that firms are motivated by the greater eco-friendliness, cost-effectiveness, space efficiency, lower pollutant emissions, simpler operation, reduced labour needs, and improved fuel supply management offered by cleaner technologies, as well as by the rising installation, operation, and maintenance costs of larger conventional boiler units. However, the adoption is hindered by unreliable electricity and pellet supply, upfront financing costs exuberated by scarce financing options, limited technical expertise, uncertainty around returns, and insufficient market demand.

Air Quality: Nepal is reported to have some of the most critical air quality challenges in the world (HEI, 2020[16]). The country is ranked eight among the most polluted countries in the world with average annual PM2.5 emissions of 42.4 µg/m3 and ranked second-highest country in terms of population weighted annual average concentrations of particulate matter at 83.1 PM2.5 µg/m3[17]. The annual report of 2024 on status of air quality in Nepal published by DoE, reflected rising trend in annual average PM2.5 concentration level from 2023 to 2024 for all the provinces of Nepal. Among the provinces, the highest annual average PM2.5 concentration level was calculated for Madhesh Province with 43.1 µg/m3 in 2023 and 43.4 µg/m3 in 2024. The study report also reported worst air quality in Bagmati Province including Kathmandu Valley with severely high PM2.5 and TSP level, particularly during winter and pre-monsoon season. The study also revealed higher PM2.5 concentration in southern region compared to northern region and in terms of season, winter and pre-monsoon season being the most polluted periods[18]. Construction activities, industrial and vehicular emissions, household and industrial waste burning, and brick kilns are the major contributors[19] with significant contribution from trans boundary emissions[20] for high level of air pollution in Nepal. Emissions from vehicles, brick kilns, biomass/garbage burning, and soil fugitive dust are regarded as the major local sources of air pollution in the Kathmandu Valley[21].

Apart from the domestic sources, the air pollution concentrations are dominated by nearby industrial emissions as well as regional influx of air pollution from the northern states of India along with the westerly wind patterns in the cities located along the southern Terai plains of the country as well as the Pokhara Valley. Additionally, sand storms in the Thar Desert, agricultural fires in the western part of the Indo-Gangetic Plain and forest fires in the eastern part contributing significant amounts of air pollutants migrating over Nepal[22]. In the industrial sector, location of cement factories and brick kilns close to urban settings and along the Southern Terai belt are also known to be the major sources of

[16] Health Effects Institute (2020). State of Global Air/2020. Health Effects Institute. https://www.stateofglobalair.org/
[17] World Air Quality Report, 2023
[18] Status of Air Quality in Nepal, Annual Report, 2024. Government of Nepal, Ministry of Forest and Environment, Department of Environment, Babarmahal, Kathmandu
[19] Giri, J. et al. (2023). Impact of air pollution on human health in different geographical locations of Nepal. Environmental Research 226. https://doi.org/10.1016/j.envres.2023.115669
[20] Nakarmi, A. et al. (2020). Mitigating the impacts of air pollutants in Nepal and climate co-benefits: a scenario-based approach. Air Quality, Atmosphere & Health.13. https://doi.org/10.1007/s11869-020-00799-6
[21] Khanal, S. et al. (2022). An episode of transboundary air pollution in the central Himalayas during agricultural residue burning season in North India. Atmospheric Pollution Research. Volume 13, Issue 1. https://doi.org/10.1016/j.apr.2021.101270
[22] Jethva H, Satheesh S K, Srinivasan J. Seasonal variability of aerosols over the indo-gangetic basin[J/OL]. J. Geophys. Res. Atmos., 2005, 110: 1-15. DOI: 10.1029/2005JD005938.

air pollutants such as CO2, CO, SOx, NOx, PM2.5, and several other HAPs. In 2014, the manufacturing industries of Nepal accounted for 32.7% of the country's CO2 emissions[23].

The Health Effects Institute, 2022[24], estimated 98% of Nepal's population are living in areas having PM2.5 levels above the least stringent WHO interim target for healthy air (35 ug/m3). Kathmandu Valley and cities in the Terai, including Lumbini, a major tourist destination are hot spots for ambient air pollution[25].

Air Quality Monitoring: Nepal's ambient air quality monitoring began in the early 1990s with campaign samplers, expanded in 2002 with six continuous PM10 and PM2.5 stations in Kathmandu Valley with the support from the Danish International Development Agency, but these became dysfunctional by 2006[26]. With the endorsement of the National Ambient Air Quality Standards (NAAQS) in 2012, the DoE began setting up real-time monitoring stations across the country based on a 2015 joint study with ICIMOD to support effective compliance with NAAQS. The DoE has established 30 AQMS among the identified 56 locations for the establishment of Air Quality Monitoring Stations[27] and is operating an online portal named pollution.gov.np that provides real time air quality data on four parameters comprising PM1, PM2.5, PM10 and TSP from 27 AQMS out of 30 stations. Additionally, AQMS monitoring stations at Ratna Park, Dhulikhel and Lumbini provides data on CO, SO_2, Nox and O_3, and AQMS at Sauraha and Pulchowk provides data on O_3 apart from data on particulate matters. The AQMS still requires upgrading for monitoring Lead and Benzene among the parameters included in NAAQS, 2012 along with establishment of CO, SO_2, Nox and O_3 monitoring system in operational and planned AQMS for formulating, implementing and enacting appropriate response strategies to address the public health and environment concern from air pollution.

Table 5-1: Province-wise AQMS

SN	Province	No. of AQMS	Location of AQMS
1	Koshi	4	Biratnagar, Damak, Dhankuta, Ilam,
2	Madhesh	1	Simara
3	Bagmati	12	Bharatpur, Bhaktapur, Bhaktapur, Bhaisipati, Dhulikhel, Hetauda, Khumaltar, Pulchowk Ratnapark, Sankhapark, Sauraha, TU Kirtipur

[23] Nepal - co2 emissions from manufacturing industries and construction as a share of total fuel combustion. https: //knoema.com/atlas/Nepal/topics/Environment/Emissions/CO2-emissions-from-manufacturing-industries-percent.
[24] Health Effects Institute (2022). Nepal Air Pollution and Health Fact Sheet. https://cdn.zevross.com/hei/country-reports/v1/pdf/Nepal.pdf
[25] World Bank (2019). Nepal Environment Sector Diagnostic: Path to Sustainable Growth Under Federalism. World Bank. https://openknowledge.worldbank.org/server/api/core/bitstreams/fefc4c8f-f115-5df1-9743-890d3980300f/content.
[26] Neupane P R, Bajracharya I, Manandhar B R, et al. Estimating emission load from road transportation within the Bhaktapur municipality, nepal[J/OL]. J. Environ. Public Health, 2020. DOI: 10.1155/2020/2828643.
[27] DoE, Annual report, 2022

4	Gandaki	3	DHM Pokhara, GBS Pokhara, PU Pokhara
5	Lumbini	4	Nepalgunj, Lumbini, Dang, Deukhuri Dang
6	Karnali	3	Accham, Rara, Surkhet,
7	Sudurpaschim	3	Bhimdatta (Mahendranagar), Dhangadi, Jhumka

Source: www.pollution.gov.np/portal

Solid Waste Management: Solid waste management including plastics and hazardous waste in Nepal's urban areas remains a major challenge, with household waste comprising 50–75% of total waste and an average generation of 317 g/capita/day[28]. Poor management, driven by inadequate landfill sites, open burning of wastes, limited technical and human resources, and lack of data and planning, leads to environmental degradation, including pollution of air, water, and soil. Waste segregation at the source or after collection is minimal, and municipalities lack the infrastructure and equipment needed for recycling. Furthermore, there is little systematic compliance with solid waste management regulations, resulting in severe impacts on public health and the environment.

OHS related to Labor & Working Conditions: There has been some improvement in understanding workplace safety in Nepal. The Labor Act 2017 and Labor Regulations 2018 have introduced important changes, including provisions on Occupational Health and Safety (OHS). The new Labor Act applies to all workplaces, regardless of the number of employees. It requires employers to provide medical and accident insurance. Workplaces must also prepare a Safety and Health Policy and form a Safety and Health Committee if they have 20 or more workers. Employers must ensure proper safety arrangements, provide training and information on safety, prevent workers with communicable diseases from returning before full recovery, and cover investigation and treatment costs for work-related illnesses.

In the industrial sector, awareness of workplace hazards has improved, helping to reduce injuries[29]. Only skilled workers are allowed to operate or replace critical components like boilers and furnaces, often through specialized suppliers. The Government of Nepal has also issued sector specific Occupational Safety and Health (OSH) guidelines for the brick industry to address workplace hazards. The Labor Act has introduced stricter penalties, including fines up to NRs 500,000 for violations like failing to provide appointment letters or discriminating among workers. Offenses such as bonded labor or neglecting safety that causes injury or death can result in up to two years of imprisonment, fines, or both. The Labor Court can also order compensation for workers affected by bonded labor.

However, OHS practices are not properly followed due to weak enforcement, poor monitoring, lack of knowledge, and ineffective implementation. OHS procedures require regular inspection of the workplace and proper risk assessment, but these are often neglected in Nepal. Both employers and

[28] Asian Development Bank Study, 2013

[29] NG, S. K, and Chellapali, T., 2023. Occupational Safety Practices in Industries of Nepal-Review. Journal of Namibian Studies. ISSN: 2197-5523

workers generally think OHS only means giving personal protective equipment (PPEs) to workers, without checking if the equipment is suitable for the job. Labor camps and construction sites often lack basic facilities like health services and proper sanitation.

Demography

The Nepal CAP Project intends to provide technical and financial support to the enterprises in adopting cleaner technology/fuel through Component 1 and strengthening existing AQM networks and expansion of additional AQMS for improved information on pollution levels of the country through Component 2. The Component 1 intends to cover enterprises in operation in Kathmandu Valley and along the IGP-HF and Component 2 intends to cover the existing AQMS in operation covering all provinces of Nepal, the demographic data is therefore presented for Nepal categorized in terms of ecological region, provincial and urban and rural area.

Population on by ecological belt: Nepal is broadly divided into three ecological regions/belts, the lowlands-Terai, Hills and Mountain region. The IGP-HF covers the lowlands of Terai ecological belt. As per the 2021 census, 53.61 percent (15,634,006 persons) of the total population live in the Terai region, 40.31 percent (11,757,624 persons) in the Hill and 6.08 percent (1,772,948 persons) in the Mountain region. The population was 50.27 percent (13,318,705 persons) in the Terai region, 43.01 percent (11,394,007 persons) in the Hill and 6.73 percent (1,781,792 persons) in the Mountain region in the 2011 Census.

Population by province: Administratively, Nepal is divided into seven provinces namely Koshi, Madhesh, Bagmati, Gandaki, Lumbini, Karnali and Sudurpaschim province. The distribution of population by province in 2021 shows that the share of population is the highest in Bagmati province (20.97 %) and the lowest in Karnali province (5.79 %). Likewise, Madhesh province (20.97%) has the second largest population. Similarly, Lumbini (17.56%), Koshi (17.01%), Sudurpaschim (9.24%) and Gandaki Province (8.46%) are the third, fourth, fifth and sixth respectively in terms of population size in 2021. The IGP-HF covers the low land areas of six provinces Koshi, Madesh, Bagmati, Gandaki, Lumbini and Sudurpaschim province.

Urban/Rural municipality population: Most of the enterprises with boilers and furnaces are in operation in the urban area of the country. In the 2021 census, the population in urban municipalities has reached 66.17 percent, while the population in rural municipalities has reached 33.83 percent. As per reallocating the population of 2011 census according to the federal structure, the population in urban and rural municipalities were 63.19 percent and 36.81 percent respectively. The Kathmandu Valley predominantly urban area constitutes three districts, Kathmandu, Bhaktapur and Lalitpur district. As per the 2021 census the combined population of these three districts is 2,996,341.

Ethnicity and Social Minorities: Based on the distinct characteristics, the National Foundation for Development of Indigenous Nationalities Act, 2002 has recognized a total of 60 different nationalities as indigenous nationalities, representing 34.86 % of the total population in 2021. The majority of the indigenous nationalities socially, economically, politically, and educationally marginalized. The HDI shows considerable disparities among various nationalities/ethnicities and castes and communities. Based on the social and economic features, the National Federation of Indigenous Nationalities

(NEFIN) further classified 60 different nationalities into five broad categories, as presented in the table given below. Newar and Tamang are the Indigenous community of Kathmandu Valley. Newar are categorized as the advantaged and Tamang as the marginalized IPs by the National Federation of Indigenous Nationalities. Similarly, the lowlands inner Terai and Terai comprises of Raji, Raute categorized as endangered, Bote, Danuwar, Majhi, Dhanuk (Rajbansi), Jhangad, Santhal (Satar) categorized as highly marginalized and Darai, Kumal, Dhimal, Gangai, Rajbanshi categorized as marginalized Indigenous community by the National Federation of Indigenous Nationalities.

The 2021 census listed the population belonging to 142 castes and ethnic groups with an addition of 17 castes and ethnic groups than 2011 census, including 60 indigenous peoples; 15 Dalit castes; and 3 religious' groups, including Muslim groups. Based on the 2021 census, 81.19 % of the total population follows Hinduism, 8.21 % follows Buddhism and 5.09 % follows Islam.

Table 5-2: Sub-categorization of the 60 different indigenous nationalities

Region	Endangered	Highly Marginalized	Marginalized	Disadvantaged	Advantaged
Mountain	-	Shiyar, Shingsawa (Lhomi), Thudam	Bhote, Dolpo, Larke, Lhopa, Mugali, Topkegola, Walung	Bara Gaunle, Byansi (Sauka), Chhairotan, Marphali Thakali, Sherpa, Tangbe, Tingaule Thakali	Thakali
Hill	Bankariya, Hayu, Kusbadiya, Kusunda, Lepcha, Surel	Baramu, Thami (Thangmi), Chepang	Bhujel, Dura, Pahari, Phree, Sunuwar, Tamang	Chhantyal, Gurung (Tamu), Jirel, Limbu (Yakthung), Magar, Rai, Yakkha, Hyolmo	Newar
Inner Terai	Raji, Raute	Bote, Danuwar, Majhi	Darai, Kumal	-	-
Terai	Kisan, Meche (Bodo)	Dhanuk(Rajbansi), Jhangad, Santhal(Satar)	Dhimal, Gangai, Rajbanshi,	-	-
Total	**10**	**12**	**21**	**15**	**2**

Source: National Federation of Indigenous Nationalities, 2002

Dalits

Dalits were categorized as 'untouchables' in the Old Civil Code and are placed at the very bottom of the Hindu caste hierarchy by the discriminatory caste-based system. Dalits comprise 13.4% percent of the total population of Nepal and do not have a specific location but are scattered throughout the country. Dalits are divided into two broad regional groups: i) Dalits in the hill areas; ii) Dalits in the Terai areas.

Table 5-3: Scheduled Castes of Dalit Community in Nepal

Ecology	Scheduled Dalit Castes
Hill Dalit	Gandharba (Gaine); Pariyar (Damai, Dargee, Suchikar, Nagarchee, Dholee, Hudke); Badi; Bishwokarma (Kami), Lohar, Sunar, Od, Chunanra, Parki, Tamata); Sarki (Mijar, Charmakar, Bhool); Pode (Deula, Pujari, Jalari); Chyame (Kuchikar, Chyamk)

Terai Dalit	Kalar; Kakaihiya; Kori; Khatik; Khatwe (Mandal, Khang); Chamar (Ram, Mochi, Harijan, Ravidas); Chidimar; Dom (Marik); Tatma (Tanti, Das); Dushadh (Paswan, Hajara); Dhobi (Rajak); Pattharkatta; Pasi; Bantar; Mushar; Mestar (Halkhor); Sarbhang (Sarbariya); Natuwa; Dhandi; Dharikar/Dhanka

Source: National Dalit Commission, 2003

Disabilities in Nepal: The Act on the Rights of Persons with Disabilities 2017 of Nepal has classified disabilities among 10 class viz. Physical Disability, Visual Impairment (Blind and low vision), Hearing Impairment (Deaf and hard of hearing), Deaf Blind, Speech Impairment, Mental Disability (Intellectual disability, mental illness, and autism), Multiple Disabilities, Dwarfism, Leprosy Cured and Cerebral Palsy. The overall prevalence of disability, according to the 2021 census, was 2.2% of the total population. Among the total persons with disability, 54.2% are males and 45.8% are females. Person with a disability is more prevalent in Karnali Province (3.1%) and least in Madesh Province (1.5%). Physical disability was the most common type of disability and represents over 34.5% percent of total disabilities. Physical disability (34.5%) and blindness/low vision (16.4%) combined account for more than 50 percent of total disabilities. Among the persons with a disability greater than 10 years age group, 56.1% are active in own work, 23.1% are employee, 19.4% supports in household works and 1.2% are employer.

Employment: The Industrial Statistics Report FY 2023/24 revealed that approximately 705,878 workers are employed in the industrial sector, with manufacturing industries contributing the largest share at 366,016 workers. Additionally, the 2017 Labor Force Survey by GoN estimated that out of around 20.7 million working-age individuals, 7.1 million were employed, while 908,000 were jobless, resulting in a national unemployment rate of 11.4%. In terms of gender, only 22.9% of working-age women were employed, significantly lower than the 48.3% of men. The World Bank's Cleaner Boiler Adoption Survey (2025) further supported this trend, highlighting lower female employment rates in the surveyed industries compared to men.

The 2017 Labor Force Survey also examined working hours, finding that men worked longer hours than women in most occupations. On average, men worked 48 hours per week, compared to 39 hours for women. The longest working hours were observed among plant and machine operators, and assemblers, where men worked an average of 54 hours per week, exposing them to greater occupational health and safety risks. Conversely, those in skilled agriculture, forestry, and fishery occupations reported the shortest working hours, with women averaging 32 hours per week and men 37 hours per week.

Regionally, unemployment rates varied significantly. Bagmati Province had the lowest rate at 7%, while Madesh Province recorded the highest at 20.1%. While urban and rural unemployment rates were relatively similar (10.9% vs. 11.6%), the employment-to-population ratio revealed a more significant gap (36.9% in urban areas vs. 29.3% in rural areas).

GBV and SEA/SH: The Nepal Population and Health Survey, 2022 reported 23% female of age group 15-49 reported suffering from some sort of physical violence from age of 15 years and 11% female reported suffering from physical violence in the last 12 months. Additionally, 26% married women of those having sexual partner, 6% never married and 9% unmarried but having sexual partner suffered from some sort of physical violence. Similarly, 47% of separated/divorced women reported

experiencing some sort of physical violence in their lifetime. In terms of sexual violence, 8% of the female of age group 15-49 has experienced some sort of sexual violence and 4% has experience sexual violence in the last 12 months. Every divorced, single or widow women out of five reported suffering from some sort of sexual violence in their life-time. 28% among the females reached out for support who have experienced physical or sexual violence and 14% have shared the experience with others and about more than half of the females (58%) who have experienced the physical or sexual violence did not reach out for support or shared the experience. Females commonly reach out to the family (62%), neighbour (35%) and friends (25%) for the support.

In Nepal, 27% of female have experienced physical, sexual or emotional violence from husband or male friend in their life-time. In the past 12 months, among 17% females who have experienced physical, sexual or emotional violence, 10% experienced emotional violence, 12% experienced physical violence and 4% experienced sexual violence from their husband, male friend or sexual partner. The experience of violence is however in decreasing trend with increasing literacy among the females. The violence from sexual partner is more prevalent in Terai (22%) than in hill and mountain region (12%) of the country. Among the provinces, incident of violence from sexual partner is least in Bagmati (10%) and more prevalent in Madhesh (32%).

6. POTENTIAL ENVIRONMENTAL AND SOCIAL RISKS, IMPACTS AND MITIGATION MEASURES

This chapter deals with the environmental and social risks, potential impacts and mitigation measures. The environmental due diligence conducted classified the project as the *Substantial Risk Project* due to the client's currently limited institutional capacity to effectively manage environmental and social issues. The project includes four major components as explained in Chapter1. Anticipated key potential risks/impacts is from the dismantling, transport, and disposal of old boilers and furnaces under component 1.2 and dust, noise emission from minor civil works during the upgardation and estblishment of air quality monitoring station and new construction of department of environment's laboratory under component 2. The sub-project types expected under these components that may have potential environmental and social (E&S) impacts include:

- Replacing boilers and furnaces that use fossil fuels and biomass with new, efficient models operating on cleaner fuels for small and medium enterprises.
- Enhancing the reliability of the current network of 30 air quality monitoring stations.
- Establishing five new air quality monitoring stations
- Upgrading infrastructure and equipment of the DoE laboratory (including the construction of a new laboratory)
- Upgrading a sufficient number of stations to monitor additional pollutants, such as PM2.5, black carbon (BC), sulfur dioxide (SO2), nitrogen oxides (NOx), and ozone (O3)

The details of interventions and scope of construction work is still in early stage. For each intervention, environmental and social assessment will require and sub-project level Environment and Social Management Plans (ESMPs) or Environmental and Social Code of Practice (ESCoPs), as required, will be prepared[30]. Since Sub-component 1.2 will channel project funds to industries through Financial Intermediaries (FIs), the environmental and social risks and impacts associated with the borrowers' activities will be managed through the FIs' Environmental and Social Management Systems (ESMSs), in accordance with the requirements of ESS 9 of WB ESF. The FIs' ESMSs will guide the assessment of the necessary environmental and social instruments. A capacity assessment of the selected FIs will be conducted, and any identified gaps in their ESMSs will be addressed to ensure alignment with the ESF. To support industries in accessing financing for boiler conversion and similar initiatives under the project, a consulting firm or individual consultants will be hired at the level of PCU-1 (Project Coordination Unit 1). These consultants will work directly with interested enterprises to assist in the preparation of comprehensive funding application packages. This includes integrating all necessary environmental and social (E&S) documentation in line with the requirements of the FI's Environmental and Social Management System (ESMS) and the Environmental and Social Framework (ESF) of the World Bank.

As part of their role, the consultants will carry out preliminary E&S screening of subprojects prior to any detailed technical assessment. This screening will follow the criteria and checklists provided in the ESMF annexes (Annex-2) to ensure that proposed subprojects do not fall under the category of 'excluded' or high-risk activities ("red flag industries") that are not eligible for support under the project. Only subprojects that pass this initial screening will proceed to the next stage, where the consultants will support the preparation of Environmental and Social Management Plans (ESMPs) and other relevant instruments such as site-specific Labor Management Procedures (LMPs).

Here potential risks and impacts for each component in their respective project life cycle (i.e., pre-construction, construction, and operation phases) are discussed in tables below. These tables have to

[30] Detailed impact assessment of each sub-project will be carried out through ESIA, EIA, IEE, or BES (as applicable based on the recommendation of E&S screening). Accordingly, an ESMP or ESCoP will be prepared depending on the level and significance of identified risks.

be read together with Table 4-1 for applicability of the relevant ESSs for the project for the anticipated specific ESS requirements. For sub-projects category and criteria and requirements please refer to Table 6-1 for Environmental and Social Assessments and Plans for different Categories of Activities, and in Table 6-2 for Stages of Subproject Development & E&S Activities and Requirements.

Table 6-1: Environmental and Social Risk Management Plan for Component 1[31]

Risk/Impact area	Potential E&S Risk and impacts	Mitigation Measures
Pre-Construction / Planning stage		
Site Clearance for temporary use for upgrading facilities and new construction	Failure to obtain necessary consents, permits, No Objections (NOs), can result in design revisions and/or stoppage of works.	Obtain all of the necessary consents, permits, NOs, prior to start of civil works. Develop necessary alternatives designs/programs for avoiding the impact on resources. Acknowledge in writing and provide report on compliance of all obtained consents, permits, clearance, NOs etc.
Preparation of environmental and social instruments	Impacts due to subprojects/activities if not properly assessed	Ensure that all upgrading and improvement facilities are carried out in compliance with the requirements stated in Chapter 7 comprising screening, ESCoPs, and site-specific ESMPs that are prepared based on the standard template given in Annex 2, 3 and 4. Prepare the national E&S instruments (BES, IEE or EIA following EPR Schedule 1,2 and 3 thresholds), if required
Sub project specific ESMP or ESCoP Implementation	If the E&S risk management unit is not established and the E&S team lacks proper training, there is a risk that the ESMP or ESCoP may not be implemented effectively or accurately, potentially resulting in adverse impacts on the environment, workers, and the community	Strengthen the E&S system with specified ToR, resources and training with due assessment as explained in chapter 9. Ensure that personnel at PMU, PIU and sub project level are trained in ESMP implementation, including standard operating procedures (SOPs). Ensure timely implementation of the ESCoPs and ESMPs. Develop measures for any unanticipated impacts.
Construction and Replacement stage		
Environmental Risks and Impacts		
Generation of waste from demolition of existing civil structures housing boilers, furnaces and kilns	Land and water pollution from unmanaged storage and disposal of demolished waste such as aggregate, concrete, wood, paper, metal, insulation, and glass that are usually contaminated with paints, fasteners, adhesives, wall coverings, insulation, and dirt. Air pollution from dust-blow during demolition activities. Possible generation of asbestos-containing waste, especially during dismantling of some old civil structures.	Prepare and implement a Demolition Waste Management Plan as part of the ESMP, ensuring compliance with Bank requirements. Store demolished waste in designated areas at least 500 meters from water sources to prevent contamination from paints, fasteners, and adhesives. Minimize waste by maximizing the reuse and recycling of materials such as concrete, steel, and wooden frames. Transport residual demolished waste to a landfill in an enclosed container.

[31] These risks will be assessed and managed through the FI ESMS

Risk/Impact area	Potential E&S Risk and impacts	Mitigation Measures
		Provide appropriate PPE, including masks, goggles, and gloves, for workers involved in demolition activities. Control dust by sprinkling water on concrete, aggregates, and waste as needed. Install temporary fencing around demolition and waste storage areas to safeguard the community and public. If asbestos-containing waste is generated, prepare and implement an Asbestos Waste Management Plan.
Generation of furnace, boilers and kilns wastes	Possible pollution from steel alloys, iron and clay during furnace, boilers and kilns replacement	Prepare and implement a Demolition Waste Management Plan as part of the ESMP, ensuring compliance with Bank requirements. Store furnace, boilers and kilns material wastes in a designated waste storage area Recycle or reuse steel and iron materials. Transfer the clay waste to the landfill in an enclosed container.
Generation of residual bottom ash, leftover coal and biomass fuel waste from the existing furnace, boilers and kilns	Land and water pollution from unmanaged storage and disposal of bottom ash, left over fuels wastes from the existing furnace, boilers and kilns.	Prepare and implement a Demolition Waste Management Plan as part of the ESMP, ensuring compliance with Bank requirements. Store residual bottom ash, leftover coal and biomass fuel waste in a designated waste storage area. Reuse bottom ash as secondary aggregates in concrete and pavements where feasible, or supply it to enterprises producing ceramics and glass-ceramics if such industries exist within the country. Provide any remaining coal and biomass fuels to enterprises that operate coal and biomass furnaces, boilers, and kilns. Dispose of the residual waste in a landfill using an enclosed container
Generation of refractories wastes from the existing furnace, boilers and kilns	Potential generation of refractory waste, including oxides of aluminium (alumina), silicon (silica), and magnesium (magnesia), as well as castable, bricks, ceramic wools or fibres, and plastics made from various fireproof compounds, may occur during the replacement of coal, biomass, and oil-fired boilers, furnaces, and kilns.	A Refractory Waste Management Plan will be prepared as a part of ESMP where relevant, and will be implemented to manage risks in a manner acceptable to the Bank. Refractory waste will be stored in a designated waste storage area. Refractory waste will be recycled if technology for recycling is available within the country

Risk/Impact area	Potential E&S Risk and impacts	Mitigation Measures
		Reusable refractory waste will be reused Residual waste will be transferred to the landfill in an enclosed container.
Possible nature resource overexploitation for feedstock sourcing for expansion of the current pellet manufacturing facilities	If whole timber or standing trees are harvested, it can accelerate deforestation, degrade habitats.	Use highly invasive "forest killer" species like *Lantana camara* and *Ageratina adenophora* as the primary feedstock. This will help is controlling the problems of choking out native plants. Use waste wood or residues extracted through sustainable forest management practices. Implement enforcement measures within the FI ESMS to ensure that whole timber and standing trees are not utilized as feedstock. These measures should include regular monitoring, and strict compliance requirements to discourage the harvesting of entire trees for processing purposes, thereby promoting sustainable sourcing practices
Pollution of water bodies and water quality	Pollution of water bodies, contamination of water sources due to construction waste disposal from enterprises	As far as possible, undertake earthworks during the dry season to avoid the potential for difficult working conditions that generally prevail during monsoon season such as problems from runoff. Locate stock yards for construction materials at least 500m away from water courses. Store fuels and lubricants away from any drainage leading to water bodies. Install temporary silt traps or sediment basins along the drainage leading to the water bodies While working near or around any water body, ensure that the flow of water remains unobstructed, and no construction materials are disposed of in a way that could block the watercourse Establish baseline and periodic water quality test of downstream major sources, if any. However, the replacement of boilers and furnaces will be done in-situ. As a result, the construction activities are unlikely to pose significant risks of pollution to water bodies
Air pollution from construction activities, storage and	Carrying out construction activities during the dry season and transporting large quantities	The planned replacement activities will be done in-situ and are expected to involve minor civil works, As a result, the

Risk/Impact area	Potential E&S Risk and impacts	Mitigation Measures
transportation of construction materials	of materials can generate dust and elevate vehicle-related pollutants	construction activities are unlikely to pose significant air pollution risks during construction. As precaution, the speed of the construction vehicles will be monitored and limited to maximum of 30 kph near settlements.
Noise pollution	Construction and rehabilitation work in the enterprises near settlements, community facilities, schools, and areas with small businesses will temporarily elevate noise levels, with potential vibrations resulting from equipment movement and excavation.	The planned replacement activities will be done in-situ and are not expected to produce significant noise risks to the communities. However, following measures will be implemented to avoid noise impacts to the settlements near the enterprises: Coordinate activity planning with local authorities to ensure noise-generating tasks are scheduled during times that cause the least disruption. Restrict construction work during night-time hours. Reduce drop heights when loading and unloading to minimize noise. Discourage the unnecessary use of horns. .
Occupational Health & Safety related risk	During the demolition of existing civil structures that house boilers, furnaces, and kilns, as well as construction activities, workers involved in these tasks may face varying levels of OHS risks and potential accidents.	Prepare, adopt, and implement the OHS Plan as part of the Environmental and Social Management Plan (ESMP). Ensure the mandatory use of safety measures and personal protective equipment (PPE) such as masks, helmets, gloves, and rubber boots. Place a first aid kit in a designated, easily accessible location. Provide safe drinking water and other necessary facilities for workers on-site. Strictly prohibit child labor in all construction activities. Offer orientation and training to workers on maintaining social harmony and prohibiting harmful behaviours, such as alcohol consumption and gambling. Engage local residents in construction activities according to their skills and qualifications.
Socioeconomic and Cultural Resources Risk and impact		
Disruption in the social harmony of the area	Poor sanitation practices by workforce may cause pollution of surrounding environment. Social problems may arise due to anti-social behaviour of the workforce such as gambling,	The planned replacement of boilers/furnace, to be completed within a very short time frame, and will not require the establishment of a labor camp. As such, the replacement and construction of minor civil structure

Risk/Impact area	Potential E&S Risk and impacts	Mitigation Measures
	alcoholism and disrespect to local people	activities are unlikely to disrupt the social harmony of the area. However, the following measures will be implemented to mitigate any potential risks: Provide detailed orientation to workers on the procedures to be followed in work areas. Prioritize local people for opportunities to work in the subproject which helps to minimize the chances of cultural discrepancy and conflict due to increased outside workers. Ensure GRM is in place, well known and is managed effectively.
Community Health and safety risks	Overall, communities will face widespread risks, including impacts on air and water quality, increased ambient noise levels, and a higher likelihood of accidents. Additionally, construction workers may introduce communicable and infectious diseases into the community	Provide awareness and orientation for workers and the community on Occupational Health and Safety (OHS), community health and safety, and Gender-Based Violence (GBV). Maintain sufficient space, adequate lighting, temporary fencing, barriers, and clear signage at worksites. Strictly prohibit children from entering active construction sites. Securely fence stockpiles and other hazardous areas. Conduct regular awareness programs on communicable diseases and hygiene practices throughout the project lifecycle. Establish a GRM that is well-communicated, accessible, and effectively managed.
SEA/SH-related risks	Possible SEA/SH-related incidents in the project area	Identify risks, key stakeholders and available service providers to address and manage any incidences of SEA/SH. Prepare code of conduct (CoC) as part of the contract document for laborers, and contractors and also for project staff. Conduct orientations on CoC to workers and require all workers to sign the CoC.
Weak consultations and information disclosure	Negative public perception of the project. Stakeholders, including Indigenous and vulnerable communities, lack access to project-related information and benefits.	Undertake periodic stakeholder engagement activities in accordance with the SEP and inform them about project activities and opportunities. Disseminate project related information through culturally appropriate and locally available means, such as project website, national and local media and social media.

Risk/Impact area	Potential E&S Risk and impacts	Mitigation Measures
	Stakeholders are excluded from participating in the planning of mitigation measures.	Establish a system through which the stakeholders can obtain project related information. Thoroughly brief the stakeholders about the possible risks and impacts of project activities and the mitigation measures. Seek their participation in designing and implementing the mitigation measures.
Lack of accessible mechanism for stakeholders to raise questions and concerns	Grievances and complaints not being addressed	Establish a functioning grievance redress mechanism (GRM) as envisaged by the SEP and raise awareness to stakeholders of the GRM. Regularly monitor GRM to ensure grievances are being received and addressed, and that the GRM is functioning as envisaged.
Operation and Maintenance Phase		
Occupational Health & Safety risks	The potential OHS risk to workers during operation are possible electric Shock and electrocution, bio-Pellet dust combustion, Moving Parts Injuries, possible contact with hot surface, heavy lifting injuries etc.	Prepare and implement an OHS plan for operation Provide regular Electrical Safety Training and PPE such as respirators, heat-resistant gloves, safety glasses etc. Carry out regular maintenance and inspection of pressure relief valves, electrical wiring, temperature controls etc Implement adequate ventilation and dust collection systems Implement fire and explosion prevention measures such as fire suppression systems, spark detection, proper storage etc.
Air emissions risks from the pellet manufacturing facilities such as dust and fines from raw materials and pelletizing process	Operation of pellet plant release wood dust (PM10/PM2.5) and air pollutants causing respiratory diseases Water used for dust suppression and cooling can carry resin acids, ash and bark fines	Implement measures for encloses dusty processes, and use of dust bags. Prepare closed loop water circuits, and settle-ponds for collecting the waste water from dust suppression.
Noise, fires and explosions	Chippers, dryers and truck movements may raise noise; Wood dust in pellet plants is highly combustible and can lead to explosions and fires.	Provide silencers and implement speed limits for operation. Implement fire and explosion prevention measures such as fire suppression, spark detection and housekeeping systems.
Community Health and Safety	Overall, communities will be exposed to cross- cutting risks from ambient air and noise level; chances of accidents, communicable and transmittable diseases, SEA/SH etc. Additionally, adjacent community	Provide awareness and orientation on community health and safety, and SEA/SH to the operational phase workers and the community. Implement measures for encloses dusty processes, and use of dust bags.

Risk/Impact area	Potential E&S Risk and impacts	Mitigation Measures
	can be exposed to fire risks induced from electric short-circuiting in the enterprises	Provide silencers and implement speed limits for operation of SMEs. Ensure the enterprise has fire and explosion prevention measures in place, such as fire suppression systems, spark detection, and proper storage. Strictly prohibit children from entering the industrial area. Properly fence off the stockpile and other high-risk areas of the enterprise. Ensure the enterprise has a functioning Grievance Redress Mechanism (GRM) and that community grievances are addressed in a timely manner
SEA/SH-related risks	SEA/SH-related incidents in the project area	Prepare code of conduct (CoC) as part of the employer requirement for laborers. Conduct orientations on CoC to workers and require all workers to sign the CoC.

Table 6-2: Environmental and Social Risk Management Plan for Component 2

Risk/Impact area	Potential E&S Risk and impacts	Mitigation Measures
Pre-Construction / Planning stage		
Site Clearance for upgrading monitoring stations and expansion	Failure to obtain necessary consents, permits, No Objections (NOs), can result in design revisions and/or stoppage of works.	The upgrading of air quality monitoring station is envisioned to be conducted in the existing area and therefore may not require site clearance and permits. Expansion and establishment of air quality monitoring stations; and new construction of laboratory will be conducted in public land where possible in close coordination with the Local Level with prior consents, permits, and NOs from relevant authority prior to start of civil works.
Preparation of environmental and social instruments	Impacts due to subprojects/activities if not properly assessed	Ensure that all construction, upgrading and improvement facilities are carried out in compliance with the requirements stated in Chapter 7 comprising screening, ESCoPs and site-specific ESMPs that are prepared based on the standard template given in Annex 3 and 4.
Sub project specific ESCoP and ESMP Implementation for expansion in new AQMS sites and new laboratory construction requiring civil works	If the E&S risk management unit is not established and the E&S team lacks proper training, there is a risk that the ESCoPs and ESMPs may not be implemented effectively or accurately, potentially resulting in adverse impacts on the environment, workers, and the community	Strengthen the E&S system with specified ToR, resources and training with due assessment as explained in chapter 9. Ensure that personnel at PMU, PIU and sub project level are trained in ESCoP/ESMP implementation, including standard operating procedures (SOPs). Ensure timely implementation of the ESCoP/ESMP. Develop measures for any unanticipated impacts.
Construction and Expansion stage		
Environmental Risks and Impacts		
Generation of hazardous waste and e-waste	Possible generation of e-wastes through air quality monitoring equipment, laboratory equipment, ICT equipment to support the improvement of data management, such as computers, servers, data drivers, spectrophotometers, and incubators. The impact during construction will be less compared to operation phase.	During screening, if significant E-Waste issues are anticipated, prepare, adopt, and implement, where relevant, an E-Waste Management Plan, as part of the ESMP. Ensure appropriate formal arrangements for the disposal and management of hazardous and / or e-waste prior to commencement of upgrading and expansion of air quality monitoring stations Introduce buy-back arrangements with the suppliers of air quality monitoring equipment and ICT equipment at the end of its useful life.
Impacts triggered from forest area use	Possible loss of vegetation	The upgrade of the air quality monitoring station and laboratory is planned for the pre-existing area and, as such, may not necessitate additional land acquisition. For the expansion of additional air quality monitoring stations and laboratory, the land

Risk/Impact area	Potential E&S Risk and impacts	Mitigation Measures
		required will be minimal and confined to public areas. This will be carried out in close coordination with local authorities to avoid the need for land acquisition. If forest land is required, select areas that do not require tree clearance.
Impact on water bodies	Pollution of water bodies, contamination of water sources due to construction waste disposal from enterprises and transport of sediments from worksites and/or construction camps (if any)	The planned upgrade and expansion of air quality monitoring stations is expected to involve minor civil works, such as fencing and concrete foundations. As a result, the construction activities are unlikely to pose significant water pollution risks. To avoid impacts on water bodies from laboratory construction following measures will be implemented: As far as possible, undertake earthworks during the dry season to avoid the potential for difficult working conditions that generally prevail during monsoon season such as problems from runoff. Locate stock yards for construction materials at least 500m away from water courses. Store fuels and lubricants away from any drainage leading to water bodies. Install temporary silt traps or sediment basins along the drainage leading to the water bodies While working near or around any water body, ensure that the flow of water remains unobstructed, and no construction materials are disposed of in a way that could block the watercourse Establish baseline and periodic water quality test of downstream major sources, if any.
Air pollution from construction activities, storage and transportation of construction materials	Conducting works at dry season and moving large quantity of materials may create dust and increase in concentration of vehicle-related pollutants	The planned upgrade and expansion of air quality monitoring stations is expected to involve minor civil works, such as fencing and concrete foundations. As a result, the construction activities are unlikely to pose significant air pollution risks. To avoid impacts from air pollution due to construction activities, storage and transportation of construction materials for new laboratory construction following measures will be implemented:

Risk/Impact area	Potential E&S Risk and impacts	Mitigation Measures
		Water sprinkling at the dry exposed surfaces and stockpiles of aggregates as necessary. Ensure all haulages transferring construction materials are covered.
Acoustic environment	Construction activities at or near settlements, community services, schools, and areas with small-scale businesses may temporarily increase the noise level and vibrations	The planned upgrade and expansion of air quality monitoring stations is expected to involve minor civil works, such as fencing and concrete foundations. As a result, the construction activities are unlikely to pose significant noise pollution risks. To avoid noise pollution from the construction of laboratories, following measures will be adopted: Plan and carry out construction work in in least disturbance hours in consultation with local community and stakeholders to minimize noise impact on nearby population. Horns should not be used unless it is necessary or unavoidable Providing ear mufflers to workers operating high dB construction equipment If it is not practicable to reduce noise levels to or below noise exposure limits, the Contractor must post warning signs in the noise hazard areas. Identify any building at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity. Complete work in these areas quickly.
Occupational Health & Safety	During the upgrade and expansion of the monitoring stations, workers may face risks such as working at heights, potential injury from moving machinery during installation, and hazards associated with lifting heavy equipment.	Prepare, adopt, and implement the OHS Plan as part of the Environmental and Social Management Plan (ESMP). Ensure the mandatory use of safety measures and personal protective equipment (PPE) such as masks, helmets, gloves, and rubber boots. Place a first aid kit in a designated, easily accessible location. Provide first-aid training to construction workers for safety of workers for all types of construction related injuries. Provide safe drinking water and other necessary facilities for workers on-site. Strictly prohibit child labor in all construction activities.

Risk/Impact area	Potential E&S Risk and impacts	Mitigation Measures
		Incorporate the Labor Management Procedure (LMP) in civil works protocols. Set up a standalone Grievance Redress Mechanism (GRM) for workers to address workplace grievances
Construction waste and solid waste disposal	Pollution of water and land resources, and cases of vector borne diseases due to haphazard disposal of construction and solid waste	The planned upgrade and expansion of air quality monitoring stations is expected to involve minor civil works, and will not require establishment of labor camp and associated construction waste, As a result, the construction activities are unlikely to pose significant construction waste and solid waste disposal risks
Socioeconomic and Cultural Resources Risk and impact		
Disruption in Social harmony of the area	Poor sanitation practices by workforce may cause pollution of surrounding environment. Social problems may arise due to anti-social behaviour of the workforce such as gambling, alcoholism and disrespect to local people	The planned upgrade and expansion of air quality monitoring stations is expected to involve minimal civil works, to be completed within a very short time frame. As such, the construction activities are unlikely to disrupt the social harmony of the area. the following measures will be implemented to mitigate any potential risks: Providing orientation to workers on the procedures to follow in work areas. Prioritizing local residents for employment Ensuring that a Grievance Redress Mechanism (GRM) is in place, well-known, and managed effectively.
Land-based impacts triggered by land acquisition	Temporary/permanent restriction to land use due to project activities	For expansion of additional air quality monitoring stations and construction of laboratory, the area required will be confined to small area which will be conducted only in public land in close coordination with the Local Level avoiding land acquisition.
Community Health and safety risks	Overall, communities will be exposed to cross- cutting risks from impacts on ambient noise level, chances of accidents, communicable and transmittable diseases may potentially be brought into the community by construction workers	The planned activities will be completed within a very short time frame, and will not require the establishment of a labor camp. Therefore, CHS issues from labour influx will be insignificant. However, the following measures will be implemented to mitigate any potential risks: Providing orientation to workers on the procedures to follow in work areas. Prioritizing local residents for employment opportunities in the subproject, which helps reduce the likelihood of cultural discrepancies and conflicts arising from the presence of outside workers.

Risk/Impact area	Potential E&S Risk and impacts	Mitigation Measures
		Ensuring that a Grievance Redress Mechanism (GRM) is in place, well-known, and managed effectively.
SEA/SH-related risks	Possible SEA/SH-related incidents in the project area	Identify risks, and available service providers to address and manage any incidences of SEA/SH. Prepare code of conduct (CoC) as part of the bid document for laborers, and contractors and also for project staff. Conduct orientations on CoC to workers and require all workers to sign the CoC.
Weak consultations and information disclosure	Negative public perception of the project. Stakeholders, including Indigenous and vulnerable communities, lack access to project-related information and benefits. Stakeholders are excluded from participating in the planning of mitigation measures.	Undertake periodic stakeholder engagement activities in accordance with the SEP and inform them about project activities and opportunities. Disseminate project related information through culturally appropriate and locally available means, such as project website, national and local media and social media. Establish a system through which the stakeholders can obtain project related information. Thoroughly brief the stakeholders about the possible risks and impacts of project activities and the mitigation measures. Seek their participation in designing and implementing the mitigation measures.
Lack of accessible mechanism for stakeholders to raise questions and concerns	Grievances and complaints not being addressed	Establish a functioning grievance redress mechanism (GRM) as envisaged by the SEP and raise awareness to stakeholders of the GRM. Regularly monitor GRM to ensure grievances are being received and addressed, and that the GRM is functioning as envisaged.
Operation and Maintenance Phase		
Generation of hazardous waste and e-waste	Possible generation of hazardous waste and e-wastes from operation of laboratory and air quality monitoring stations such as computers, servers, data drivers, spectrophotometers, and incubators	Develop technical human resources for the maintenance of air quality monitoring and ICT equipment. Establish buy-back programs with suppliers of air quality monitoring and ICT equipment for equipment at the end of its service life. Develop, adopt, and implement an operational phase E-Waste Management Plan where applicable, to address risks related to batteries, e-waste, and other concerns
Generation of chemical waste	Improper disposal of chemical waste, contaminated materials, laboratory test samples and test equipments can pose risks to the environment	Establish and implement a proper waste management procedure for chemical waste, including segregation, labeling, secure storage, and disposal by certified vendors.

Risk/Impact area	Potential E&S Risk and impacts	Mitigation Measures
		Install and operate appropriate wastewater treatment system to eliminate contaminants and toxic substance Adequate training, protective gear and safety protocols for employees. Ensure compliance with national and international standards for laboratory operations and environmental protection
Occupational health & safety risks	Handling chemicals and sensitive equipment can pose risks for laboratory workers. Accidental spills during handling, transportation, or storage of chemicals causing risks for laboratory workers including possible fire hazards.	Prepare and enforce OHS protocols for laboratory workers that includes handling of chemicals, test equipment, PPE use etc. Provide adequate training on possible OHS risks and use of protective gear Implement fire and explosion prevention measures such as fire suppression systems, spark detection, proper storage etc.

Table 6-3: Environmental and Social Risk Management Plan for Component 3

Risk/Impacts	Potential E&S Risk and impacts	Mitigation measures
Weak capacity of PIUs, FIs and SMEs on E&S risks management	Lack of or poor E&S risks management capacity of PIUs, FIs and SMEs can lead in ineffective ESMP/ESCoP preparation and implementation, potentially resulting in adverse impacts on the environment, workers, and the community	Provide capacity development training on E&S risks management to the PIUs, FIs and SMEs for efficient management of E&S risks.
Weak or poor capacity in GRM implementation	Lack of capacity in handling grievances and complaints can potentially result into negative public perception and dissatisfaction towards the project	Capacitate in strengthening the project's GRM along with FIs GRM to ensure effective institutionalization of GRM
Weak M&E capacity	Poor monitoring and evaluation of E & S risks/impacts can lead to failure in early detection of warnings signs that can have serious E&S implications in longer time period, projects may fall out of line with national regulations and World Bank ESF	Capacitate in strengthening the project's E&S M&E along with FIs E&S to ensure compliance of projects activities with E&S risk/impacts management requirements as per the national regulations and World Bank ESF

In case of triggering the Component 4: The Project Steering Committee (PSC) will advise. The PIUs will update the ESMF to cover the activities supported under the CERC. If the CERC activities are not covered by the existing ESMF, addendum to the ESMF will be prepared to address the associated risks.

7. ENVIRONMENTAL AND SOCIAL RISK MANAGEMENT PROCEDURES

This section outlines the detailed procedure for environmental and social (E&S) risk management during project implementation. The E&S procedures ensure the effective integration of environmental and social considerations into subproject design and execution, enhancing risk management and determining appropriate instruments for risk mitigation.

The procedure establishes systematic criteria for identifying the level of environmental assessments required, their sequencing, and compliance with legal requirements. Once a subproject or activity is justified, the E&S risk management process begins with environmental and social screening followed by preparation of appropriate E&S instruments. The ESMF will guide the screening and assessment of activities in alignment with Nepal's legal framework and the World Bank's ESF and its ESSs.

The following process illustrates the detailed procedure for assessing and managing E&S risks and impacts.

7.1. Environmental and social guidance for site selection, planning and design of subproject

1. As part of planning and design of a subproject, there should be an analysis of the options for locations/ sites of the subproject or subproject components considering environmental and social risks and impacts, including forest clearance, landslides, floods, etc

    - Subproject or subproject components should avoid using the forest areas or other habitat (subproject in natural and critical natural habitat is not eligible *see Annex 1: Exclusion list*).

    - Sites of subproject or subproject components should avoid acquiring private land and structures

2. Subproject or subproject components should be located adequately away from cultural sites

    - Close consultation with stakeholders during subproject planning and implementation should be ensured. The consultations so far conducted and the planned for future engagements are described in the Stakeholder Engagement Plan (SEP) which is prepared as a separate document in compliance with the World Bank ESS10. To keep the stakeholder informed and to get timely feedbacks from stakeholders, the PIUs shall implement and continually update the SEP throughout the project lifecycle.

    - The sub-project will follow the mitigation hierarchy mentioned in Sub-chapter 7.4 while planning the sub-projects.

7.2. Environmental and Social Screening

Environmental and social screening is a step for initial assessment of the environmental and social impacts and risks of project activities. Each proposed activity is first screened to understand potential social and environmental risks, impacts, and concerns, and help to determine the extent and depth of environmental and social due diligence required. Objectives of the environmental and social screening process are:

- Confirm if the sub-project activities meet the eligibility criteria listed in *Annex 1*.
- Identify potential environmental and social risks and impacts and assign a category and type to the sub-project.
- Determine the level and scope of environmental and social assessments needed, and the specific measures required to manage identified risks and impacts.

A screening checklist has been prepared for use during this process (*see Annex 2*). The ESMF guides this screening and assessment process, ensuring compliance with Nepal's legal framework and the World Bank's ESF and its ESS.

The Project Implementation Units (PIUs) are responsible for environmental and social screening and the screening reports. Environmental and social screening will be done based on the criteria provided in Schedules 1, 2 and 3 of EPR 2020 and World Bank ESSs. The E&S screening report shall be approved by the PIUs subject to the prior concurrence with WB.

7.3. Categorization of Sub-projects

Sub-projects will be categorized into four types based on the screening results:

Category I Subprojects: To avoid and/or minimize risks and impacts of the project activities, certain activities that have potential of high E&S risks and impacts are excluded. A list of these excluded projects is provided in *Annex 1- Exclusion List*. Category I Subprojects are equivalent to high-risk category per the WB ESF.

Category II Subprojects[32]: Sub-projects with limited adverse environmental or social impacts confined to the immediate project site can typically be managed using known or readily available mitigation measures. Such projects may require BES, IEE or EIA, along with a corresponding ESMP, adhering to national and World Bank requirements[33]. Although private land acquisition is not currently anticipated, Category II subprojects might affect Indigenous Peoples (IPs) or vulnerable groups, requiring specific measures integrated into ESMPs and SEPs. All E&S management plans for these subprojects must undergo review by the PIU and be cleared by the World Bank. Category II Subprojects are equivalent to Substantial risk category per the WB ESF.

[32]The CAP project is designed to reduce air pollution and its associated impacts, primarily resulting in positive environmental and social (E&S) outcomes. Currently, we do not anticipate any sub-projects requiring a detailed Environmental and Social Impact Assessment (ESIA) or even an Environmental Impact Assessment (EIA). However, as a precaution for potential future scenarios, this has been incorporated into the procedure.

[33] Schedule 1, 2 and 3 of EPR (2020) has explicitly listed the types and natures of the project requiring Brief Environmental Study (BES), Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Respectively.

Category III Subprojects: These sub-projects have some adverse impacts or risks, but these are site-specific, reversible, and easily managed with appropriate mitigation measures. Preparation of an ESMP is required, and occasionally, a Brief Environmental Study (BES) might be necessary according to government regulations. An activity is classed as Category III if its potential adverse environmental or social impacts on human and/or on the environment are less adverse than those of Category II activities. Category III Subprojects are equivalent to Moderate risk category per the WB ESF.

Category IV Subprojects: These sub-project activities will have minimal or no adverse environmental and social impacts. After the initial E&S screening, no further assessments are required for these sub-projects. The screening report will recommend mitigation measures for any minor impacts identified. In specific situations, site-specific guidance, such as an Environmental and Social Code of Practice (ESCoP), may be provided. Many project activities, including the strengthening and expansion of AQM stations, fall into this category. Category IV Subprojects are equivalent to Low risk category per the WB ESF.

Categorization of subproject activity is essential for early understanding to determine the level of assessment needed for a particular sub-project. Table 7-1 details out the required E&S assessment bases on category.

Table 7-1: Environmental and Social Assessments and Plans for different Categories of Activities

Category of Sub-Project	**Is E&S and Social Impact Assessment Required? (beyond initial screening)** ***WB Requirement***	**Is E&S Impact Assessment Required? (beyond initial screening)** ***National Requirement***	**E&S Instrument required**	**Comments**
Category I	Not supported by the project	Not supported by the project	Not applicable	Not supported by the project
Category II	Yes, ESA	Yes, either IEE or EIA	Yes	Additional Management Plans might be required based on the impact
Category III	ESMP	Brief Environmental Study may be required in some cases	Yes	
Category IV	No	No	No	Use ESCOP to mitigate adverse impacts during implementation.

7.4. Environmental and Social Assessment of Sub-Projects

After sub-projects have been screened and categorized, PIUs will prepare a Terms of Reference (TOR) for Environmental and Social (E&S) Assessments[34]. The PIUs will either conduct these assessments themselves or hire consultants to carry them out based on the approved TOR. If necessary, additional management plans, such as an Emergency Response Plan, will also be prepared alongside the E&S Assessment reports and sub-project-specific ESMPs. The environmental and social assessment will apply a mitigation hierarchy, which will:

i. Anticipate and avoid risks and impacts;
ii. Where avoidance is not possible, minimize or reduce risks and impacts to acceptable levels;
iii. Once risks and impacts have been minimized or reduced, mitigate; and;
iv. Where significant residual impacts remain, compensate for or offset them, where technically and financially feasible.

The assessment will be carried out to assess the risks or negative impacts of the sub-projects that may have on the physical, biological, and socio-economic and cultural environment and to determine measures for avoiding, mitigating, or offsetting such undesired effects. The PIUs will ensure that all the impacts identified in the environmental and social assessment have been assessed and relevant mitigation measures are adequately provided in the ESMPs and in additional E&S plans, if any. All subprojects E&S assessments shall be reviewed by the PIU before submitting to the concerned agencies for no objection and/or approval. The assessment will inform decision-makers about the potential E&S impacts of the proposed sub-projects and to suggest and document appropriate and reasonable mitigation measures to mitigate and/or minimize the adverse impacts.

E&S Specialists from PIUs will collaborate with the project design teams to integrate environmental and social measures into the project design. Site-specific measures identified in the assessments will be incorporated into the detailed designs and technical specifications, if applicable. guidance provided in Section 7.1 will be followed during the selection of project sites, planning, and design. No sub-project will begin until all required environmental and social documents have been prepared and approved by GoN and/or the World Bank (WB).

The enforcement, monitoring and compliance check will be carried out by the E&S Specialists of PIUs during the construction (contract award and commencement of works) and by the DOE and DOI during operation and maintenance of the project.

7.5. Environmental and Social Management Plans

[34] The ToR will not be required for Category 4 sub-projects that will require ESCoPs.

Environmental and social screening of the sub-project will determine whether ESIAs with ESMPs or only ESMPs or ESCoPs are required (see Table 7-1). The ESMP must identify all significant adverse environmental and social impacts, describe detailed mitigation measures, and link them to relevant plans. It should outline monitoring objectives, technical monitoring details, reporting procedures, and institutional responsibilities for implementation. The ESMP must also include a phased implementation schedule, cost estimates, and funding sources for mitigation, monitoring, and capacity building. Mitigation measures should be integrated into procurement processes, and contracts must comply with OHS standards, Labour Management Procedures, and safeguard measures against SEA/SH and child labour.

The key steps for managing any potential adverse impacts of any activity are presented in following Table 6-2.

Table 7-2 : Stages of Subproject Development & E&S Activities and Requirements

Stage in subproject cycle	Step in assessment process	Required Document
Subproject Identification	Environmental and social screening to determine key risks and impacts Field verification if feasible	Environmental and Social Screening Form / Report
Subproject planning and design (for activities that do not require assessment and only require Guidance)	Consultation with key stakeholders Preparation of Guidance Follow environmental guidance and criteria (Section 7.1) during subproject site selection, planning and design of subproject Ensure integration of guidance into bidding documents	Site specific good practice guidance- ESCOP
Subproject planning and design (for activities that require assessment and preparation of ESMPs to meet ESS requirements)	Prepare ToR to carry out ESIA and/or ESMP and other mitigation plans; Assessment of the E&S impacts and mitigation measures ESIA/ESMP preparation	ESA[35]/ESMP
Subproject review and approval	Review and approval of reports: Review reports to assess if all possible issues have been adequately addressed to facilitate the decision-making process; decide if project should proceed, or if further alternatives must be examined or be abandoned.	ESA/ESMP
Procurement of works and services	Integrate ESMP, other management plans, Code of Conduct into bidding documents if works are to be carried out by contractors	ESIA/ESMP, Bidding document
Implementation/Construction	Orient/train contractor and other workers/field staff on ESMP requirements Supervise, monitor and report on ESMP compliance	Compliance Monitoring Report

[35] ESA might be ESIA, EIA or IEE, whichever is applicable

	Take corrective action where needed	
Completion and Operation	Post construction maintenance and operation in line with ESMP	Compliance Monitoring Report

7.6. Financial Intermediaries

The sections outline the principles, rules, guidelines and procedures for E&S issues management under sub-component 1.2 of the project. This is the sub-component that focuses on incentives provided through a dedicated financing mechanism to promote cleaner technologies and fuels. As sub-component 1.2 will utilize a Financial Intermediary (FIs) for the channelling of project funds to the industries, as per the requirements of ESS 9, environmental and social risks and impacts associated with the activities of the borrowing industries will be addressed by the environmental and social management systems (ESMSs) of the selected FIs themselves.

During the project preparation, it was determined that RBB will serve as a handling bank. The World Bank assessed the RBB's capacity for environmental and social risk management. The RBB follows the Environmental and Social Risk Management (ESRM) guideline for Banks and Financial Institutions. The Guidelines are approved by the Nepal Rastra Bank Central Office (Banks and Financial Institutions Regulations Department, February 2022). The RBB has a solid ESMS in place and screens its operations through its ESMS. There are some gaps between the RBB's ESMS and the WB ESF. These gaps will be addressed before RBB received project funds. During the project implementation, the RBB and PIU-MoICS will screen all interested FIs. Review of the FI's ESMS is one of the eligibility criteria. Once on board, the selected commercial banks or financial institutions will be required to screen application documents, including the E&S requirements, from the industries interested in cleaner energy sources (i.e replacement of boilers) and ensure that the enterprises are compliant with the national requirements and the ESF requirements outlined in this ESMF. To support industries in accessing financing for boiler conversion and similar initiatives under the project, a consulting firm or individual consultants will be hired at the level of PCU-MoICS. These consultants will work directly with interested enterprises to assist in the preparation of comprehensive funding application packages. This includes integrating all necessary environmental and social (E&S) documentation in line with the requirements of the FI's Environmental and Social Management System (ESMS) and the Environmental and Social Framework (ESF) of the World Bank.

As part of their role, the consultants will carry out preliminary E&S screening of subprojects prior to any detailed technical assessment. This screening will follow the criteria and checklists provided in the ESMF annexes (Annex-2) to ensure that proposed subprojects do not fall under the category of 'excluded' or high-risk activities ("red flag industries") that are not eligible for support under the project. Only subprojects that pass this initial screening will proceed to the next stage, where the consultants will support the preparation of Environmental and Social Management Plans (ESMPs) and other relevant instruments such as site-specific Labor Management Procedures (LMPs).

During the loan processing stage, the Financial Intermediary (FI) will play a key role in ensuring compliance with ESS9 of the World Bank's ESF. The FI will use the same E&S screening checklist (Annex-6) to verify the following aspects before approving any loan application:

1. **Eligibility Check**: Confirm that the proposed activity complies with the project's ESMF, including exclusion criteria and applicable environmental and social standards;

2. **E&S Documentation**: Ensure that required E&S instruments (e.g., ESMP, LMP) have been properly prepared and disclosed;
3. **Regulatory Compliance**: Confirm that the necessary environmental regulatory approvals (such as Initial Environmental Examination (IEE) or Environment and Social Management Plan or Environment and Social Code of Practices (ESCoPs)) have been obtained or are clearly identified to be obtained before the commencement of any operations.
4. **Risk Management**: Assess whether the subproject has adequate mitigation and monitoring measures in place to address potential E&S risks and impacts.

The FI will maintain proper documentation of all E&S assessments and decisions made during the appraisal and financing process. Regular monitoring will also be conducted to ensure that enterprises comply with their E&S commitments throughout project implementation using the checklist (Annex-7).

8. STAKEHOLDER ENGAGEMENT, DISCLOSURE AND GRIEVANCE REDRESS MECHANISM

A constructive engagement with the project stakeholder throughout the project life cycle is crucial to build a strong trust with the local community as well being critical to the success of the project. Stakeholder activities aim to build trust with the project stakeholders that include project affected parties, those who have interest in project activities and the vulnerable groups that can be disproportionately affected by project activities through periodic consultation, information disclosure and grievance management throughout the project lifecycle. A standalone SEP has been prepared for the project in compliance with the World Bank's ESS10 with an objective to achieve effective stakeholder involvement and to promote better understanding of project goals and activities among the stakeholders. The overall purpose of the SEP is to define a set of actions to meaningfully engage the stakeholders through periodic consultations, dissemination of the project-related information that are easily accessible and understandable to the project-affected and beneficiary parties and other interested parties during entire project cycle. The SEP has defined and categorized (maps) project stakeholders to help analyse various groups, to consider their interest in the project, and to identify the most effective and appropriate forms of communication and engagement with those groups, so that engagement can be tailored to these groups. In addition, specific and targeted approaches are adopted in the SEP to ensure that poor and vulnerable marginalized groups which include women, indigenous people, Dalits, Madhesis have meaningful participation in the decision-making process, and in design and implementation of the activities. The SEP is a "living" document and will be updated as required to address the changing project implementation circumstances and needs of the stakeholders.

During the project preparation, there were extensive consultations with different stakeholders, including small and medium enterprises and women entrepreneurs. Comments and reflections were reflected in the project design and in communication strategy. Half-day Consultations with women-led Enterprises were held on April 22, 2025. Consultations on this ESMF were initially held on July 31, 2025 and on a later version on November 4 and 13, 2025. Minutes of the consultations are included in the Annex 9.

8.1. Information Disclosure

All relevant documentation and management plans prepared under the project, for example, the ESMF, SEP, and Environmental and Social Commitment Plan (ESCP), are required to be disclosed and made accessible to all stakeholders. The information will be disclosed through all relevant means, including through face-to-face and virtual consultations with the project stakeholders, distribution of hard copies, posters, leaflets and brochures, through social media, project website and local media so that these are accessible to all project beneficiaries of the project, including those in remote areas.

This ESMF will be disclosed by MoICS and DoE.

8.2. Grievance Redressal Mechanism (GRM)

MoICS, and DoE have existing grievance management systems and focal points, as mandated by Nepal's Good Governance framework (2008 Act and 2009 Rules) in addressing the grievances within their scope area. However, to ensure project related grievances, concerns and complaints of project stakeholders including beneficiaries are promptly addressed, the project will put in place an effective and functioning project-focused grievance redress mechanism (GRM). All the project related grievances registered through multi-entry point will be registered and will be handled by this GRM. The GRM will follow an understandable and transparent process that is culturally-appropriate and readily accessible to all affected communities. The project will offer the grievance redressal services at no cost to complainants. The existence of the GRM will not impede access to judicial and administrative remedies. The project expects that a functioning and effective grievance redressal will contribute to build trust and cooperation as an integral component of broader community consultations. The SEP explains in detail the mechanism in place, including the structure of the GRM, intake channels for grievance, procedure for resolution and the escalation process.

The project proposes single tier GRM at both the PIUs at MoICS and DoE. The GRM at MoICS will oversee the project related grievances for component 1 including that of HB and FI and GRM at DoE will oversee the project related grievances for component 2. The GRM Committee will be led by National Project Manager (NPM) for each component and will comprise of environmental specialist and social specialist. The social specialist in PIU-MoICS and the Environmental and Social specialist at PIU-DoE will act as a GRM and SEA/SH and GBV focal person. These specialists will be additionally trained to properly handle any SEA/SH allegations. This committee is required to assess and address grievances within fifteen (15) days. As part of their reporting requirement, each PIU GRM is required to report on its performance to a Project Steering Committee (PSC): indicating number of grievances received and resolved. Every FI will be required to have a grievance mechanism as part of their ESMS. All grievances that come to FI will be screened through the FI ESMS. If no resolution for a grievance is found, it will then be passed on to the responsible PIU GRM. FI will regularly report on the number of grievances received and resolved.

Once a grievance is resolved, the complainant receives a formal closure notification summarizing the actions taken and the final decision. If the complainant remains dissatisfied or if a grievance remains

unresolved after final stage, they will be informed about the appeal process and legal recourse as per the Government of Nepal's grievance policies. Additionally, the complainant has the right to legal recourse at any time during the process.

The project GRM will not impede the existing GRM at MoICS and DoE for uptake of project related grievances. Mechanism will be established to uptake the project related grievances through multiple intake points into the project GRM system.

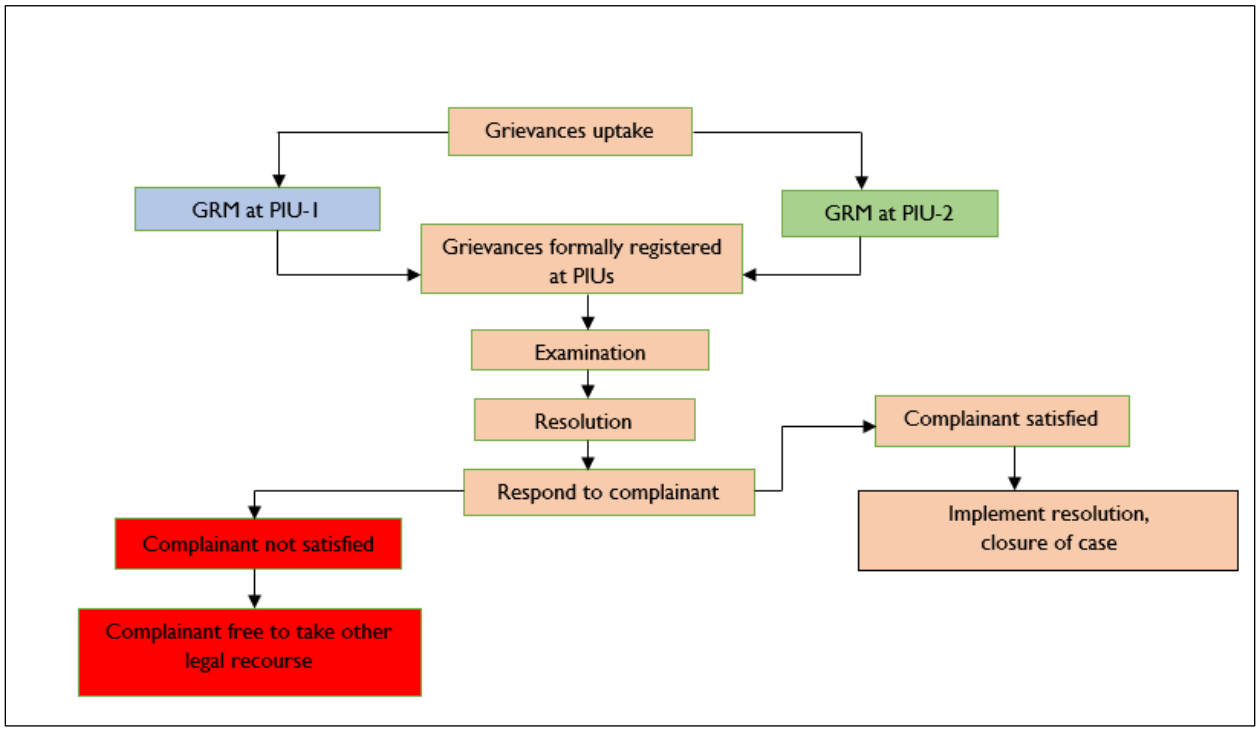

Figure 8-1: Flow Chart of Grievance Management Procedure

8.3. Handling SEA/SH-Related Grievance

The SEA/SH risk assessment for Nepal CAP Project is low. The PIUs will include SEA/SH clause in direct workers contract and will enforce zero tolerance for SEA/SH and adherence to Codes of Conduct (CoCs) in all workplaces. A mandatory orientation training on SEA/SH will be provided from the PCU and PIUs during the onboarding of direct workers. Additional trainings will be carried out throughout the project implementation in line with the training plan.

For any SEA/SH related grievances, the Grievant can file a written or verbal complaint, or a representative can file a complaint after receiving the survivor's consent. The complaints are registered without indicating the name of survivor. The GRM will have a designated focal point who will be properly trained to receive,

manage and direct these grievances. A guidance note on SEA-SH incident response will be developed for the project. Grievances can be filed to the SEA/SH gender focal point at the project implementation units (PIUs). The incident is reported to the World Bank within 24 hours using ESIRT through respective PIUs handling the incident.

Screening for SEA-SH risks will be integrated in the FI ESMS. SEA/SH protocols will be reviewed as part of the FI's eligibility review.

9. PROJECT IMPLEMENTATION ARRANGEMENTS, RESPONSIBILITIES, AND CAPACITY BUILDING

9.1. Overall Project Management and Coordination

Project Steering Committee (PSC)

The project will establish an inter-ministerial PSC to provide overall policy guidance and ensure coordination across different components of the Nepal CAP Project. For this, the project has envisaged a Project Steering Committee (PSC), which will have representation from the , MoICS, MoFE, Ministry of Finance (MoF), Ministry of Health and Population (MoHP), Ministry of Physical Infrastructure and Transport (MoPIT), Department of Environment (DoE), Department of Industry (DoI), and Federation of Nepalese Chamber of Commerce and Industry/ Confederation of Nepalese Industries (FNCCI/CNI), Alternative Energy Promotion Centre (AEPC), Department of Transport Management (DoTM), etc. The project steering committee will be chaired by Secretary of MoICS. The main responsibility of the PSC will be to i) conduct semi-annual project implementation review; ii) provide policy orientation and supervise the implementation of the project activities; iii) facilitate and ensure smooth coordination across all project components to ensure alignment with the project's intended development objectives; (iv) resolve disputes or conflicts related to the project if any; and (v) endorse the Project Operations Manual.

Ministry of Industry, Commerce and Supply (MoICS)

MoICS will lead the implementation of Component 1 project activities through a Financial Intermediary (FI). A Project Implementation Unit (PIU-MoICS) will be established at the Industrial Technology and Environment Division of MoICS and will be responsible for implementing the industrial pollution abatement activities. The PIU at MoICS will be headed by the Joint Secretary of Industrial Technology and Environment Division as National Project Manager (NPM) and will be technically supported by the Director, Technology and Environment of DoI, Nepal Bureau of Standard and Metrology (NBSM), DoLOS, and Industry Promotion Board (IPB). The PIU-MoICS throughout the duration of the project, will be supported by a Central Technical Implementation Support Team (CTIST) comprising a team of diverse experts such as industrial engineering, energy-efficiency, environment and social risk management, management, gender, and stakeholder engagement. The PIU will also house dedicated FM and procurement specialists to support various activities of Component 1. The specific roles and responsibilities of the unit will be coordination with HB and FI, industrial stakeholders and other relevant stakeholders, provide technical assistance to industries in identifying and adopting cleaner technologies, perform monitoring and evaluation to track the project progress, measure outcomes and compliance with environmental regulations, facilitate FI for financing cleaner technology interventions, collaborate with regulatory agencies in strengthening and enforcement of environmental regulations for adherence from industries, and preparing and submitting regular progress reports to the World Bank and other stakeholders, highlighting achievements, challenges, and lessons learned.

Department of Environment (DoE)

DoE will lead the implementation of the component 2 of the project that aims at enhancing air quality monitoring, policy formulation, enforcement capacity and regional cooperation. PIU-DoE will be headed preferably by the Deputy Director General of the DoE as a NPM with technical lead from the Pollution Control and Regulation Section. The NPM will be responsible for overall implementation of the Component 2 activities. The PIU will include team of experts comprising environmental scientists, lab technicians, social/environmental specialists, procurement/financial management experts, policy experts, data and Management Information System (MIS) consultants, gender, communications experts and other support staffs to support effective implementation of the planned project activities.

Financial Intermediary

A state-controlled Bank will act as a financial intermediary in channelling grants or loans for the adoption of cleaner technologies to the industries/enterprises. The financial intermediary will have Environmental and Social Management Systems (ESMS) for managing associated environmental and social risks. The PIU-MoICS will support in establishing and/or strengthening the Environmental and Social Management Systems (ESMS) in the financial intermediary. One or more Financial Intermediaries (FIs) will be engaged to channel project funds to small and medium industries for the replacement of inefficient boilers and furnaces with cleaner technologies, in alignment with FI's Environmental and Social Management System (ESMS) and the World Bank's Environmental and Social Framework (ESF). To facilitate this process, a consulting firm or individual consultants will be hired under the PIU-MoICS to support interested industries in preparing funding application packages. These packages will include all necessary environmental and social (E&S) documentation. Consultants will conduct initial E&S screening of proposed subprojects using criteria outlined in Annex-2 of the ESMF to exclude high-risk or non-eligible activities. Eligible subprojects will then receive support in preparing site-specific instruments such as Environmental and Social Management Plans (ESMPs) and Labor Management Procedures (LMPs).

During loan appraisal, the FIs will conduct an independent review using the E&S checklist provided in Annex-6 to verify ESMF compliance, the completeness of required E&S instruments, and the status of regulatory approvals such as BES & IEE etc. FIs will also assess whether appropriate risk mitigation and monitoring measures are in place. All E&S-related assessments and decisions will be properly documented, and the FIs will carry out regular monitoring throughout project implementation, using the monitoring checklist in Annex-7, to ensure that financed enterprises maintain compliance with their E&S obligations.

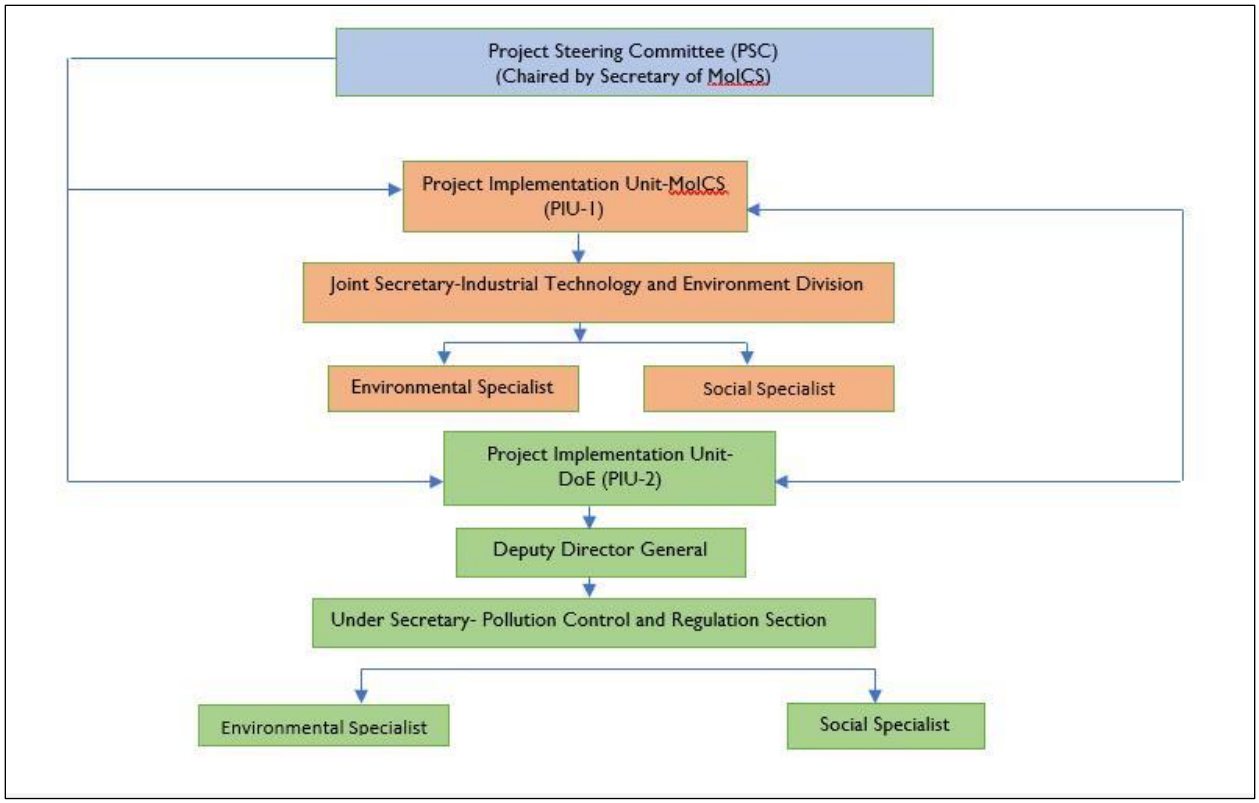

Figure 9-1: Organogram from ESMF implementation arrangements

The overall project arrangements are summarized in the Table 8-1 below.

Table 9-1 Summary of the responsible Agencies

PSC	• Provide policy orientation and supervise the implementation of the project activities • Review project implementation semi-annually • Facilitate and ensure smooth coordination across all project components to ensure alignment with the project's intended development objectives • Resolve disputes or conflicts related to the project if any • Endorse the Project Operations Manual
At MoICS PIU-MoICS	• Coordinate and with the Financial Intermediary, industrial stakeholders, and other relevant agencies to ensure smooth implementation of project activities through regular meetings, progress reviews, and reporting • Establish a robust monitoring and evaluation framework to track the progress of project activities, measure outcomes, and ensure compliance with environmental regulations. • Provide technical assistance to industries in identifying and adopting cleaner technologies • Conduct capacity building activities for industry practitioner through workshops, training sessions, and knowledge-sharing platforms • Coordinate and facilitate FI in financing for cleaner technology interventions • Collaborate with regulatory agencies to strengthen and enforce environmental regulations • Responsible for preparing and submitting regular progress reports to the World Bank and other stakeholders, highlighting achievements, challenges, and lessons learned.

	• Implementation of ESMF requirements for Component 1 activities.
At DoE PIU-DoE	• Overall implementation of component 2 activities • Strengthening of air quality monitoring and information system • Strengthen national and regional AQM planning, coordination and partnership • Coordinate with key agencies for regulating key sources of pollution, including MoICS, to monitor and regulate major industrial pollution sources • Implementation of ESMF requirements of Component 2 activities • Implementing, monitoring and coordination activities for the E & S risk management of each sub-project • Prepare and submit periodic E & S risk management report of the project to World Bank
Financial Intermediary	• The FI will manage the distribution of (a) subsidies, (b) concessional loans, and (c) risk-sharing mechanisms to qualifying enterprises to overcome upfront cost barriers faced by industries. • Prepare and implement an Environmental and Social Management System (ESMS) to identify, assess, manage and monitor the E & S risks and impacts for the sub-projects • Implementing, monitoring and coordination activities for the E & S risk management of each sub-project • Prepare and submit periodic E & S risk management compliance report of the project to PIU-MoICS

9.2. ESMF Implementation Arrangements and Responsibilities

The PIUs Environmental and Social Specialists will be the focal point for environmental and social matters and will be responsible for implementing and monitoring the ESMF, and other relevant management documents including the ESCP of the project as outlined in Table 8-2 below.

Table 9-2 Role and Responsibilities in implementing the ESMF

Responsible Person/Agency	Responsible task
At MoICS	
Environmental Specialist and Social Specialist at the PIU-MoICS	• Implementation of ESMF requirements of Component 1 activities including SEP, LMP and ESCP. • Design and deliver relevant capacity building and training, including on the World Bank ESS's, to effectively implement the ESMF to relevant project staff and stakeholders. • Communicate with the World Bank on environmental and social-related matters for component 1. • Facilitate FI for the preparation and implementation of ESMS and environmental and social instruments, and ensure implementation of the E&S risk management at sub-project industry/enterprise level • Liaise with FI to ensure smooth implementation of the project. • Conduct E&S monitoring in coordination with FI • Prepare periodic E&S monitoring reports and quarterly ESMF, SEP and LMP compliance reports for submission to the World Bank • Organize periodic consultations with the project stakeholders including strategic engagement with the vulnerable groups. • Ensure the implementation of environmental and social management plans, and functioning of the Grievance Redress Mechanism (GRM) as envisaged by the SEP. • Ensure regular dissemination of project-related information to the project stakeholders. • Organize capacity building and training for the project stakeholders, including the FI
At DoE	
Environmental Specialist and Social Specialist at the PIU-DoE	• Implementation of ESMF requirements of Component 2 activities including SEP, LMP and ESCP. • Design and deliver relevant capacity building and training, including on the World Bank ESS's, to effectively implement the ESMF to relevant project staff and stakeholders. • Conduct E&S screening of the component 2 sub-projects and determine level of assessment required. • Prepare required E&S instruments as identified by screening • Implement and monitor the mitigation measures as envisaged by the ESMP. • Organize periodic consultations with the project stakeholders including strategic engagement with the vulnerable groups. • Ensure regular dissemination of project-related information at the local level. • Ensure smooth functioning of the GRM system as envisaged by the SEP. • Prepare periodic E&S monitoring reports and quarterly ESMF, SEP and LMP compliance reports for submission to the World Bank Organize capacity building and training for air quality monitoring to the provincial and local level staffs.

9.3. Capacity for Implementing the ESMF

The MoICS/DoI and DoE are new to implementing the World Bank's environmental and social policies. Therefore, their capacity needs to be strengthened to ensure effective application of this ESMF and related environmental and social plans. As the lead implementing agencies, MoICS and DoE will require extensive capacity building and training to effectively monitor and manage the ESMF, ESCP, and SEP.

The project will finance capacity building programs at both federal and local levels, developed in coordination with relevant government agencies. These programs aim to raise environmental and social awareness among project teams and promote good practices that ensure compliance with applicable standards and minimize negative impacts.

Under these activities, the PIUs, and FI, including their Environmental and Social Specialists, will receive training on the World Bank's Environmental and Social Standards (ESSs), particularly on ESMF implementation. Training will also cover monitoring and reporting, stakeholder engagement, grievance redress, and consultation processes. Additionally, contractors and their workers will be trained on ESMF compliance and basic Occupational Health and Safety (OHS) requirements.

Table 9-3 Planning for Capacity Building Training

Training program	Targeted Audience	Conducted by	No. of training program
WB ESSs including implementation of the ESMF, management procedures, consultation and GRM, monitoring and reporting, OHS	PIUs and FI	World Bank	One training program during initial phase of the project
WB ESSs and implementation of E&S management plans	FI	PIU MoICS	One training prior to the execution of the project, and annually during project implementation
Training on OHS and SEA/SH	FI	PIU MoICS	One training prior to the execution of the project, and annually during project implementation
Training on stakeholder engagement and GRM management	FI	PIU MoICS	One training prior to the execution of the project, and annually during project implementation
Training for air quality monitoring	Provincial and local level staff engaged in air quality monitoring	PIU DOE	One training prior to the execution of the project, and annually during project implementation

9.4. Monitoring and Reporting Plan

Each PIUs will carry out compliance monitoring and will submit ESMF compliance reports quarterly to the World Bank. Each project implementation unit (PIUs) will consolidate the monthly report for the respective components and will then prepare a quarterly monitoring report and submit it to the World Bank. The PIUs will also disclose the monitoring report on the project website. The regular monitoring report will cover the environmental, health and safety (EHS) performance of the project, and status of implementation of environmental and social mitigation measures, stakeholder engagement activities and functioning of the grievance mechanism, among others.

9.5. Internal ESMF Monitoring and Reporting

The monitoring reports on the environmental, health and safety (ESHS) performance of the project, including, but not limited to, the implementation of the ESCP, status of preparation and implementation of environmental and social documents required under the ESCP and/or ESMF, stakeholder engagement activities and functioning of the grievance mechanism(s) will be prepared and submitted to the World Bank quarterly by both PIUs. Internal monitoring/reporting for ESMF will be the responsibility of the Environmental and Social Specialists at the PIUs. These reports will cover (for those activities that require application of environmental and social standards):

- Description of mitigating actions/corrective actions (if required).
- List of consultations held (sites, dates, names or participants, details of participants consulted, for example, indigenous groups.
- Key issues raised during consultations.
- Follow up monitoring visits will be required to ensure the effective implementation of any required mitigation measures and to assess whether the standards continue to be met.

9.6. External ESMF Monitoring and Reporting (Independent Audit)

An external or third-party ESMF monitoring will be conducted twice during project implementation - at mid-term and during the final year of project implementation - to ensure that all E&S issues are being properly addressed and that mitigation measures are being implemented as envisaged by the ESMF. The third-party ESMF monitoring will be able to identify and recommend any amendments to the approach embodied in this ESMF to improve its effectiveness. The third-party monitoring will be done by an independent body procured by the respective PIUs for component 1 and component 2, external to the project, who is not a beneficiary nor part of the project management and implementation structure. The external monitoring will also validate and check the internal, project level monitoring systems. It will also ensure that the project's GRM system to address complaints is functioning effectively. Some site visits will be required to determine the situation on the ground and to check on the measures that have been applied. Respective PIUs will submit these ESMF monitoring reports to the World Bank. The reports will be disclosed in the GoN and World Bank web pages. ESMF monitoring reports during the project implementation will provide information on key environmental and social aspects of the project activities and on the effectiveness of implementation of ESMF. Such information will allow the PIUs and the World Bank to evaluate the success of measures to mitigate adverse impacts within the project and allow corrective actions to be identified and taken.

9.7. Supervision by the World Bank

Supervision of ESMF-related project activities, including through field visits as appropriate, will be carried out as part of the World Bank's regular project supervisions. In the case of specific issues/complaints or non-compliance with the ESMF, the World Bank task team may wish to contract further independent monitors to carry out site-based investigations and prepare reports identifying further actions required.

10. COSTS OF ESMF IMPLEMENTATION

The project budget will finance the implementation of the ESMF. This funding will cover the costs of specific ESMF activities, such as recruiting E&S specialists, capacity building, stakeholder engagement (SEP), the GRM, field monitoring, and mitigation measures. These activities are described in Table below.

The costs incurred by sub-project activities related to the implementation of their mitigation measures will be included in each of their ESMP budgets during the preparations of ESMPs.

Table 10-1: ESMF Implementation and Monitoring Budget

SN	Activity	Level	Budget Yrs. 1-5 (NRS)	Remarks
1	E&S Specialists (Environmental and Social Specialist at each PIUs)	PIUs	36,000,000.00	
2	Capacity development training on E&S risk management, GRM and M&E	PIUs	12,000,000.00	
3	SEP implementation including project GRM	PIUs	50,900,000.00	
4	Independent 3rd party ESMF monitoring	PIUs	2,000,000.00	Contracted by PIUs (twice during project implementation)
5	ESMF Monitoring	PIUs	9,000,000.00	
	Total		**109,900,000.00**	

ANNEX 1: EXCLUSION LIST

The following type of activities will not be supported by the Project

- Activities that contravene Nepal's obligations under its international agreements
- Activities that convert or degrade natural and critical habitats
- Any new construction proposed within legally protected areas, including national parks, wildlife reserves, and their buffer zones, are resticted. However, the maintenance or rehabilitation of existing air quality monitoring station within their established and confined footprint may be permitted, provided that these activities do not expand the physical footprint.
- Activities involving harmful or exploitative forms of forced labor and/or child labor
- Activities that cause dislocation, modification, or restriction of access to cultural heritage sites and pose adverse impacts on cultural and heritage sites
- Activities that violate human rights or involve human trafficking
- Projects that release or potentially release significant amounts of greenhouse gases and contaminants into the environment without measures to reduce them to acceptable levels
- Activities that may affect lands or rights of Indigenous Peoples or other vulnerable minorities
- Activities that require obtaining Free, Prior, and Informed Consent (FPIC) from Indigenous Peoples
- Activities that may involve permanent resettlement, land acquisition, or adverse impacts on cultural heritage
- Activities with a high probability of causing serious adverse effects on human health and/or the environment (e.g., construction of major civil structures)

ANNEX 2: ENVIRONMENTAL AND SOCIAL SCREENING FORM TEMPLATE

A. Subproject Information:

Subproject Title	
Subproject Location	Municipality/ Rural Municipality: _____ Ward No: _____ District: _____ Province: _____
Project objectives	
Estimated Cost	
Start/Completion Date	
Brief Description of Subproject	

B. Eligibility Criteria

Criteria Question	Answer (Yes/No)
1. Does the Subproject contravene Nepal's obligations under its international agreements?	
2. Does the Subproject convert or degrade natural and critical habitats	
3. Is the Subproject going to encroach into national parks of protected area, including their buffer zone?	
4. Is the Subproject going to displace, modify or restrict/block access to cultural heritage sites, historical monuments, religious structure and other sites considered sacred by the local community?	
5. Do the Subproject involve land acquisition requiring permanent resettlement?	
6. Do the Subproject activities affect lands or rights of Indigenous Peoples or other vulnerable minorities?	
7. Do the Subproject activities have high probability of causing serious adverse effects on human health and/or the environment?	

Note: If the answer of at least one of the questions above is "Yes", then the subproject is NOT ELIGIBLE FOR FUNDING.

C. EPA/EPR Categorization

Please consult Schedule 1, 2 and 3 of EPR (2020) or the latest MoFE Screening/Scoping Protocol relevant to the Subproject, if any. Attach the completed protocol to this ES Screening Form.

What is the Subproject's Category (Check)?	EA Process Requirements
_____ Schedule 3?	The subproject would be required to undertake the national regulatory requirements of the EIA process and approved by MoFE or concerned provincial authority prescribed by provincial law.
_____Schedule 2?	The subproject would be required to undertake an IEE as per national requirements to be approved by appropriate agency
_____Schedule 1?	The subproject would be required to prepare a Brief Environmental Study and to be approved by appropriate provincial or local government agency

D. Environmental and Social Screening Questionnaires

Questions	Answer		Next Steps
	Yes	No	
1. Is the subproject likely to have significant adverse environmental impacts that are sensitive and unprecedented that trigger the 'Ineligible Activities' or other exclusion criteria?			If "Yes": Exclude from project.
2. Does the subproject involve new construction or significant expansion of industries and AQMS[36]?			If "Yes": 1. If substantial risk is anticipated prepare required environmental and social instruments (e.g.: EIA/IEE/BES depending on the risk classification) 2. Prepare a site- ESMP for the proposed subproject, based on the template in Annex 3. 3. Include E&S risk management measures in bidding documents.
3. Does the subproject involve renovation or rehabilitation of any small-scale infrastructure, such as boiler/furnace/kilns facilities or AQMS facilities?			If "Yes": 1. Apply relevant measures based on the ESCOPs in Annex 2 (unless one of the questions below raises specific environmental risks and requires a site-specific ESMP). 2. Include E&S risk management measures in bidding documents.
4. Will construction or renovation works require new borrow pits or quarries to be opened?			If "Yes": 1. Prepare a site-specific ESMP for the proposed subproject, based on the template in Annex 3. 2. Include E&S risk management measures in bidding documents.
5. Does the project lead to any risks and impacts on, individuals or groups who, because of their particular circumstances, may be disadvantaged or vulnerable.[37]			If "Yes": Apply relevant measures described in the ESMF and SEP.
6. Does the subproject involve uses of goods and equipment involving forced labor, child labor, or other harmful or exploitative forms of labor?			If "Yes": Exclude from project.
7. Does the subproject involve recruitment of workforce including direct, contracted, primary supply, and/or community workers?			If "Yes": Apply LMP
8. Will the workers be exposed to workplace hazards that needs to be managed in accordance with local regulations and EHSGs? Do workers need PPE relative to the potential risks and hazards associated with their work?			If "Yes": Apply LMP.

[36] These two are critical questions in the Screening Form, as they will determine whether a sub-project can use pre-prepared ESCOPs included in Annex 2 or needs to prepare a site-specific ESMP. If all the sub-projects are expected to be low risk, then all sub-projects may be able to use the pre-prepared ESCOPs. However, if there are some sub-project activities, which may propose moderate risk, these may require site-specific ESMPs to be prepared and for substantial risks required environmental and social instruments needs to be prepared.

[37] "Disadvantaged or vulnerable" refers to those individuals or groups who, by virtue of, for example, their age, gender, ethnicity, religion, physical, mental or other disability, social, civic or health status, sexual orientation, gender identity, economic disadvantages or ethnic peoples status, and/or dependence on unique natural resources, may be more likely to be adversely affected by the project impacts and/or more limited than others in their ability to take advantage of a project's benefits.

9. Are PPE inspections and maintenance performed regularly to ensure they are in safe working condition?			
10. Is there a decontamination area available for workers to safely remove or replace PPE after handling chemicals?			
11.. Is there a risk that women may be underpaid when compared to men when working on the project construction?			If "Yes": Apply LMP.
12. Is the project likely to generate solid or liquid waste that could adversely impact soils, vegetation, rivers, streams or groundwater, or nearby communities?			If "Yes": 1. Prepare a site-specific ESMP for the proposed subproject, based on the template in Annex 3. 2. Include E&S risk management measures in bidding documents.
13. Is waste transported in labelled and leak -proof containers?			
14. Is there a record -keeping system in place to track the quantities, storage and disposal of waste?			
15. Do any of the construction works involve the removal of asbestos or other hazardous materials?			If "Yes": prepare a Asbestos Management Plan as part of the ESMP
16. Are works likely to cause significant negative impacts to air and / or water quality?			If "Yes": 1. Prepare a site-specific ESMP for the proposed subproject, based on the template in Annex 3. 2. Include E&S risk management measures in bidding documents.
17. Is there a risk of increased community exposure to communicable disease (HIV/AIDS, Malaria), or increase in the risk of traffic related accidents?			If "Yes": Apply LMP and relevant measures in SEP.
18. Is an influx of workers, from outside the community, expected? Would workers be expected to use health services of the community? Would they create pressures on existing community services (water, electricity, health, recreation, others?)			If "Yes": Apply LMP.
19. Is there a risk that SEA/SH may increase as a result of project works?			If "Yes": Apply LMP.
20. Would any public facilities, such as schools, health clinic, religious sites be negatively affected by construction?			If "Yes": Apply relevant measures based on the ESCOPs in Annex 2 (unless one of the other questions in the screening form raises specific environmental and social risks and requires a site-specific ESMP).
21. Are there any Indigenous Peoples or Sub-Saharan African Historically Underserved Traditional Local Communities present in the subproject area and are likely to be affected by the proposed subproject negatively?			If "Yes": Ensure meaningful consultation throughout the project cycle with the IPs and LCs as per the SEP.
22. Have the stakeholders of the Project been identified?			If "Yes", please name them along with their level of influence and interest in the Project, Major issues raised by the stakeholders during the initial consultation? Main sources of information for the stakeholders? [Hint: radio, TV, newspapers]
23. Is there social institution/practice for community consultation on common issues in the area?			If "Yes", briefly include the social institutions and practices followed for community consultation
24. Is there any social/religious/cultural institution or practices for local dispute settlements?			If "Yes", briefly include the social institutions and practices followed for local dispute settlement

25. Are there any youth clubs, women groups or NGOs active in the project area and in the district?			If "Yes", briefly include the youth clubs, women groups or NGOs present in the area. Ensure meaningful consultation throughout the project cycle as per the SEP

E. Summary of Screening Results

1. Eligibility (Base on item B above, please check those that apply below).

_____ This Subproject is eligible for funding as per eligibility criteria.

_____ This Subproject cannot be considered for funding due to (Please describe the reason/s):

_____

_____

_____ This Subproject is deemed ineligible for funding but may be revised and resubmitted for re-Screening with a change/changes on the following (Please specify the required changes):

_____

_____

2. Subproject will need to prepare the following instruments (Please check the ones that are required based on the answers in item C and D above):

_____ESIA/EIA

_____IEE

_____ESMP

_____ESCoP

_____Others please specify

_____

Name and title of person who conducted screening:

Environmental and Social Screening Prepared by:

1. Environment Specialist Name: Date:	**1. Social Specialist** Name: Date:
Environmental and Social Screening Verified by: Name: Designation: Date:	

ANNEX 3: ENVIRONMENTAL AND SOCIAL CODES OF PRACTICE (ESCOP) TEMPLATE

The ESCOPs should contain specific, detailed and tangible measures that would mitigate the potential impacts of each type of eligible subproject activity under the project. They shall be marked as relevant for the planning phase, the implementation phase, or the post-implementation phase of activities. They shall be simple risk mitigation and management measures, readily usable.

General ESCOP for minor civil works for upgrading of industry boiler facility and AQMS

Risk/Concern	Environmental Prevention/Mitigation Measures	Responsible Party
General		
	a) Plan activities in consultation with communities and stakeholders so that noisiest activities are undertaken during periods that will result in least disturbance. (Planning phase) b) Use when needed and feasible noise-control methods such as fences, barriers or deflectors (such as muffling devices for combustion engines). (Implementation phase) c) Minimize dust from exposed work sites by applying water on the ground regularly during dry season. (Implementation phase) d) No soiled materials, solid wastes, toxic or hazardous materials should be stored in, poured into or thrown into water bodies for dilution or disposal. (Implementation phase) e) Segregate construction waste as recyclable, hazardous and non-hazardous waste. (Implementation phase) f) Collect, store and transport construction and demolished waste to appropriately designated/ controlled dump sites. (Implementation phase) g) On-site storage of wastes prior to final disposal (including earth dug for foundations) should be at least 300 metres from rivers, streams, lakes and wetlands. (Implementation phase) h) Use secured area for storage and transfer of toxic materials distant from settlement area (and at least 50 metres from drainage structures and 100 metres from important water bodies); ideally on a hard/non-porous surface. (Implementation phase) i) Train workers on correct use of gloves, boots, aprons, eyewear and other protective equipment for protection in handling highly hazardous materials. (Implementation phase) j) After each construction site is decommissioned, all debris and waste shall be cleared. (Post-Implementation phase)	

ANNEX 4: TEMPLATES FOR ESMP

Environmental and social risks and impacts are strongly linked to subproject location and scope of activities. This ESMP should be customized for each specific subproject location and activities.

1. Subproject Information

Subproject Title:	
Estimated Cost:	
Start/Completion Date:	

2. Site/Location Description

This section concisely describes the proposed location and its geographic, ecological, social and temporal context including any offsite investments that may be required (e.g., access roads, water supply, etc.). Please attach a map of the location to the ESMP.

3. Subproject Description and Activities

This section lists all the activities that will take place under the subproject, including any associated activities (such as building of access roads or transmission lines, or communication campaigns that accompany service provision).

4. ESMP Matrix: Risk and Impacts, Mitigation, Monitoring

This section should identify anticipated site-specific adverse environmental and social risks and impacts; describe mitigation measures to address these risks and impact; and list the monitoring measures necessary to ensure effective implementation of the mitigation measures. It may draw from the ESMF's pre-identification of potential risks/impacts and mitigation measures, as applicable, and drill down further to ensure relevance and comprehensiveness at the site-specific level. For subprojects involving construction, two sets of tables may be needed, for the construction phase and the operation phase.

Anticipated E&S Risks and Impacts	Risk Mitigation and Management Measures	Impact Mitigation		Impact/Mitigation Monitoring		
		Location/Timing/Frequency	Responsibility	Parameter to be monitored	Methodology, including Location and Frequency	Responsibility

5. Capacity Development & Training

Based on the implementation arrangements and responsible parties proposed above, this section outlines any capacity building, training or new staffing that may be necessary for effective implementation.

6. Implementation Schedule and Cost Estimates

This section states the implementation timeline for the mitigation measures and capacity development measures described above, as well as a cost estimate for the implementation. The cost estimate can focus on the line items that will be covered by the project implementing agency, with costs of mitigation measures to be implemented by the contractor left to the contractor to calculate.

7. Attachments

IV. Review & Approval

Prepared By: ……(Signature) Position: …… Date ……	
Reviewed By: ……(Signature) Position: ……Date ……	**Approved By**: ……(Signature) Position: …… Date ……

ANNEX 5:

1. GAP ANALYSIS BETWEEN NATIONAL AND WORLD BANK E&S REQUIREMENTS

Table below describes a gap analysis and measures to bridge the gaps between the ESSs and GoN policy and legal requirements for environmental and social risk management related to this project.

World Bank		**Nepal's policy framework and requirements**	**Gaps between ESSs and GoN & legal and policy requirements**	**Gap-Bridging Measures**
ESS	**ESS Requirements**			
ESS 1: Assessment and management of Environmental and Social Risks and Impacts	ESS 1 requires the Borrower will assess, manage and monitor the environmental and social risks and impacts of the project throughout the project life cycle so as to meet the requirements of the ESSs in a manner and within a timeframe acceptable to the Bank. The Borrower will: (a) Conduct an environmental and social assessment of the proposed project, including stakeholder engagement; (b) Undertake stakeholder engagement and disclose appropriate information in accordance with ESS10; (c) Develop an ESCP, and implement all measures and actions set out in the legal agreement including the ESCP; and (d) Conduct monitoring and	Environment Protection Act (2019), Environment Protection Regulation, (2020) and National Environmental Impact Assessment Guidelines, (1993) are legal instruments for the requirements of Environmental and Social Assessment of any development	• The Schedules are based on activity type, threshold/size, as well as location. The Potential risks associated with the project are omitted in GoN policy. • No provision for associate project projects/activities; large projects can be split into smaller projects to avoid full EIA study. • Scope of EIA may not cover all WB ESS. • EPA/EPR does not allow use of other types/forms of assessments. • Does not emphasize hierarchy of measures in ES risk management planning	• This ESMF includes E&S screening assessment followed by detailed ESMP/ESCOP preparation to bridge the gap between WB and GoN requirements. • The ESMP will aim to address all the adverse environmental impacts that arise during execution and operation of the project. • The ESMP so prepared will be made integral part of the bidding document so that the contractor shall adhere to the provisions prescribed in the ESMP during the execution of the project.

	reporting on the environmental and social performance.			
ESS 2: Labor and Working Conditions	There are numbers of requirements of ESS2 under the following heading: • Working conditions and management of worker relationships; • Protecting the work force; • Grievance mechanism; • Occupational Health and Safety • Contracted workers; • Community workers; and • Primary supply workers	Labor Act (2017); and; Child Labor Act (2001) are legal instruments.	• Current OHS legislation is not adequate (No separate legislation on OHS. • Current OHS mandate is provided only in Chapter 12 of the Labor Act) • Lack of industry-specific standards (DoLOS has so far issued only one directive: OHS Directive for Brick Workers)	• Labor Management Procedure (LMP) is developed and implemented for the project • Guidelines will be developed on occupational health and safety (OHS) issues • Workers GRM will be established • FI ESMS will look over the component 1.2 Labor related issue.
ESS 3: Resource Efficiency and Pollution Prevention and Management	The Borrower shall consider ambient conditions and apply technically and financially feasible resource efficiency and pollution prevention.	EPA (2019), EPR (2020), National Ambient Air Quality Standards (2003) Nepal Vehicle Mass Emission Standard (2012), National Ambient Sound Quality Standard (2012), Standard on Emission of Smoke in Air by New and Existing Diesel Generator (2012), National Water Quality Standard (2008)	• Lack of suitable enforcement mechanisms for legislation on resource use efficiency in projects • Management of pesticides and hazardous waste is done as per country legislations and GIIP and EHS guidelines are not followed except for IFI funded projects.	• Resource efficiency and pollution prevention in any project activity need to be emphasized during the design and implementation of the activity. • National standards related to environmental protection and resource efficiency will be complied by the project. • Emission Standard for industrial boilers will be applied

		Tolerance Limits for Industrial Effluents to be discharged into Inland Surface Waters (2003) The Solid Waste Management Act (2011) Solid Waste Management Rule (2013) Water Resources Act (1992) Water Resources Rules (1993) Drinking Water Regulation (1998)		
ESS 4: Community Health and Safety	There are numbers of requirements of ESS4 under the following headings: • Community health and safety and • Security personnel	The EPA identifies the direct and indirect human health impact as one of the components in assessing the effect of development projects. EPA Section 7: Nobody shall create pollution in such a manner as to cause significant adverse impacts on the environment or likely to be hazardous to public life and people's health.	• There is limited coverage as scope of ESIAs do not necessarily include community safety issues. • Public health legislation does not specifically impose requirements for development and infrastructure projects.	• ESMPs developed under the project will aim to address all community health and safety issues that arise during execution and operation of the project.
ESS 7: Indigenous Peoples/Sub-Saharan African Historically	The project is unlikely to pose adverse impacts to indigenous people as the project doesn't aim to acquire or put the restriction in the use of land or take land on a lease that belongs	NFDIN Act 2002 along with Local Self Governance Act, 1999 and current 16th five yr Plan focused to incorporate infrastructure and income	Nepal is culturally diverse country, hosting multiple ethnic groups including 60 indigenous groups or nationalities across all provinces. Of the total population, the indigenous people account for about 37 percent.	ESMF and SEP provides specific measures to ensure there is meaningful consultation with representative institutions of relevant affected indigenous peoples at different levels and to ensure they are not deprived of opportunities offered by the project.

Underserved Traditional Local Communities	to indigenous peoples for the project activities	generation program targeted to indigenous community.	However, the possibility of exclusion or restriction of indigenous peoples to the project's benefits and medical services cannot be ruled out.	The ESMF and SEP provides guidance on inclusion of and engagement with indigenous program under the project.
ESS 10: Stakeholder Engagement and Information Disclosure	The project will ensure that it will adopt a consistent, comprehensive, coordinated, and culturally appropriate approach for engaging stakeholders and disclosing project related information.	Prevailing national polices including EPA 2019 and EPR 2020 has envisaged the stakeholder engagement at different stage of the project design and implementation. Stakeholder consultation, disclosure and grievance hearing system is provisioned.	A framework approach to address and ensure stakeholder engagement and discloser is lacking for systematic planning and implementation of activities related to Stakeholder Engagement and Information Disclosure	The project has prepared a Stakeholder Engagement Plan (SEP) to ensure that stakeholder engagement activities are effective and meaningful consultation is carried out including guideline for establishing a clear, safe and accessible procedures to identify and respond to SEA/SH, cases to project GRM.

2. International Conventions

The relevant international treaties, conventions, and declarations are as follows:

- Paris Agreement 2015
- Convention on Long-Range Transboundary Air Pollution 1979
- UN Human Rights Council 2011
- Basel Convention on the Control of Trans Boundary Movements of Hazardous Wastes and their Disposal 1989
- Vienna Convention and Montreal Protocol on protecting the ozone layer
- Rio Declaration on Environment and Development,1992
- Declaration of United Nations Conference on the Human Environment 1992
- United Nations Declaration on the Rights of Indigenous Peoples
- ILO Convention 169

ANNEX 6: PFI E&S DUE DILIGENCE CHECKLIST

Basic Information	
Date	
Name of SME	
Location	
Industry/Sector	

GENERAL RISKS		
#	Mark the Answer x	
1.1	**Are there any legal issues associated with the SME's E&S performance?**	
		a) SME has all valid permits and has not faced any legal claims or any serious environmental/social incident in last three years
		b) SME does not have all valid permits but has taken definite steps to acquire them in next six months and/or SME has faced legal claims but has addressed or has definite plan to address all of them
		c) SME does not have all valid permits and has not taken any definite step to acquire them and/or SME has faced legal claims and has no definite plan to address them
		d) Not applicable
	Remarks:	
1.2	**Have operations ever been affected by local stakeholder grievances, media or non-governmental organization (NGO) campaigns over E&S issues?**	
		a) There is no evidence of stakeholder grievances, negative media or NGO protest
		b) There is evidence of stakeholder grievances, negative media or NGO protest for a particular operation and SME has taken adequate steps to address the issue
		c) There is evidence of stakeholder grievances, negative media or NGO protest and SME has not taken any step to address the issue
		d) Not applicable
	Remarks:	
1.3	**Is the project site and/or its routing likely to have negative impacts on sensitive areas (residential or protected sites) near the project site?**	
		a) No sensitive areas observed
		b) There are a few sensitive areas, and the SME has taken adequate measures to mitigate the impact of their operation on the sensitive areas as per regulations
		c) There are sensitive areas observed and mitigation measures are not adequate as per regulations and the SME may face legal challenge in future
		d) Not applicable

	Remarks:	
1.4	**Is the project involved or will involve acquiring land with resettlement?**	
		a) Neither land acquisition nor involuntary resettlement observed
		b) There is land acquisition and voluntary resettlement and the SME has taken adequate measures as per regulations to mitigate the negative impacts of displacement, to identify development opportunities for all affected persons.
		c)There is land acquisition and involuntary resettlement and the SME has not taken adequate measure as per regulations and the SME may face legal challenge in future
		d) Not applicable
	Remarks:	

ENVIRONMENTAL, HEALTH AND SAFETY RISKS		
2.1	**Is there any evidence of air and noise pollution from the SME's operation violating the Environment Protection Rules 2020 or the conditions specified in the SME's Pollution Control Certificate?**	
		a) There is no air /noise pollution and agreed monitoring system is in place
		b) There is air/ noise emission and agreed actions are implemented partially only. SME is addressing or has a definite plan to address the remaining issues
		d) There is evidence of air emission/noise and no reduction measures are implemented. SME has no definite plan to address the issues
		d) Not applicable
	Remarks:	
2.2	**Is there any evidence of water pollution due to SME's operation, violating the Environment Protection Rules 2020 or the conditions specified in the SME's Pollution Control Certificate?**	
		a) There is no evidence of water pollution and non-compliance and /or all mitigation measures and monitoring systems are in place
		b) There is evidence of water pollution and non-compliance and partial mitigation measure monitoring system is in place and the SME is addressing or has a definite plan to address the remaining issues
		c) There is evidence of water pollution and non-compliance and there is no mitigation measure/monitoring system in place. SME has no definite plan to address the issues
		d) Not applicable
	Remarks:	
2.3	**Is there any evidence of land pollution and lack of waste handling mechanism in the project operation violating the Environment Protection Rules 2020 or the conditions specified in the SME's Pollution Control Certificate?**	

		a) There is no evidence of land contamination or lack of waste handling mechanism or non-compliance OR all mitigation measures and monitoring systems are in place
		b) There is evidence of land contamination or lack of waste handling mechanism or non-compliance AND partial mitigation measure, monitoring system is in place AND SME is addressing or has a definite plan to address the remaining issues
		c) There is evidence of land contamination or lack of waste handling mechanism or non-compliance AND there is no mitigation measure/monitoring system in place AND SME has no definite plan to address the issues
		d) Not applicable
	Remarks:	
2.4	**Has the SME made any investments in technologies or measures in its operation leading to cost savings by reducing energy consumption (increasing energy efficiency) or using renewable energy (solar, wind, mini-hydropower, organic fuel)?**	
		a) The SME made investment in energy efficiency technologies / measures OR in renewable energy generation (electricity or heat) OR analyzed its operation from the energy efficiency standpoint (e.g. energy audit) and is actively pursuing opportunities for energy related cost savings.
		b) The SME is considering identifying opportunities for cost savings from improved energy efficiency or renewable energy use but has not made any particular steps in this direction yet
		c) The SME has never made any investment in technologies or measures for energy related cost savings and appears to be unaware of the opportunities in these areas
		d) Not applicable
	Remarks:	
2.5	**Are there any Climate Change related risks (flood, drought, cyclone etc.) and opportunities (GHG emission reduction) associated with the SME's operation?**	
		a) SME has a robust disaster management plan to combat climatic risks AND SME has procedures in place to measure, disclose, set targets and mitigate its GHG emissions
		b) SME has a disaster management plan but it is not robust AND there is evidence that SME has intention to measure, disclose, set targets and mitigate its GHG emissions in near future
		c) No disaster management plan AND no definite plan to measure, disclose, set targets and mitigate its GHG emissions in future
		d) Not applicable
BIODIVERSITY RISKS		
4.1	**Does the project pose a threat to habitats (e.g., modified, natural, and critical habitats; threats to endangered species) and/or risks to endangered species and/or ecosystems and ecosystem services?**	
		a) There is no evidence of issues that may pose a threat to habitats ecosystems and ecosystem services
		b) There are few evidences of issues that may pose a threat to habitats and/or ecosystems and ecosystem services

		b) There is evidences of significant issues that may pose a threat to habitats and/or ecosystems and ecosystem services
		d) Not applicable
	Remarks:	
4.2	**Are there any risks of loss of floral and faunal biodiversity during construction and operation?**	
		a) There are no risks of loss of floral and faunal biodiversity during construction and operation.
		b) There are limited risks of loss of floral and faunal biodiversity during construction and operation AND the SME has a definite plan to prevent the loss of floral and faunal biodiversity and plans for compensatory plantations as per regulatory requirements.
		c) There are significant risks of loss of floral and faunal biodiversity during construction and operation AND the SME has no definite plan to prevent the loss of floral and faunal biodiversity and no plans for compensatory plantations as per regulatory requirements.
		d) Not applicable
	Remarks:	

SOCIAL RISKS		
3.1	**Is there any evidence of increased fire risk or occupational health &safety (OHS) risk, i.e. risk of injuries at work?**	
		a) The SME does not have any OHS concern or have mitigated them adequately
		b) The SME has some OHS concern but has taken definite steps to correct them
		c) The SME has OHS concern in its operation and have no plans of correcting them
		d) Not applicable
	Remarks:	
3.2	**Are the labor and working conditions poor and breaching local regulations / standards?**	
		a) There is proper working condition and labor practice AND there is no evidence of poor working condition or labor practice for which SME may face legal challenge or labor unrest or negative media coverage or protest from activist
		b) There are a few evidences of poor working conditions BUT no significantly poor labor practice such as child/forced labor is present AND the SME has a definite plan to improve the working condition to ensure there is no legal challenge or labor unrest or negative media coverage or protest from activist in future
		c) Working condition is very poor AND/OR there is presence of significantly poor labor practice such as child labor/forced labor AND SME is not addressing/has no definite plan to address the issues
		d) Not applicable

	Remarks:	
3.3	**Does the project pose a threat to Community Health, Safety and Security?**	
		a) There is no evidence of issues that may create nuisance/accidents/injuries to the indigenous peoples & local community in the future or the company has a robust plan for community health & safety which was developed in consultation with the local community
		b) There are a few evidences of issues that may create nuisance/ accidents/ injuries to the indigenous peoples & local community AND the SME intends to address the gaps AND/OR the SME has a plan for community health & safety but it is not robust or it is not developed in consultation with the community
		c) There is evidence of significant issues that can create nuisance/ accidents/injuries to indigenous peoples & local community AND SME has no definite plan to address the gaps AND/OR does not intend to manage its impact on community health & safety
		d) Not applicable
	Remarks:	
3.4	**Is there any evidence of community consultation with key stakeholders including indigenous peoples and local community?**	
		a) There is evidence that the SME consults /engages with the stakeholders including local community, indigenous peoples regsrding its operation and its risks.
		b) There are limited /inadequate consultations with the stakeholders
		c) No consultations with the stakeholders
		d) Not applicable
	Remarks:	

ANNEX 7: PFI PERIODIC E&S MONITORING CHECKLIST

S.N.	Question/Issues to check	Response
Project Summary information		
1.	Reporting period covered by this supervision report	
2.	Specification of project stage (design, construction, operation or closure stage)	
3.	Key developments and any major changes in project location and design, if any from the time of loan disbursement or from the last supervision period.	
General Information		
4.	Status of implementation of E&S instruments and/or agreed Corrective Action Plan. Is it in line with the agreed timeframe? (i.e., if all agreed actions are implemented or partially implemented or not implemented). If partially implemented or not implemented, mention the reason in the response column along with a timeline for completion of implementation as committed by the client during supervision.	
Permits and Compliance		
5.	All the required permits, licenses and clearances in place. Mention the issuance dates and duration of validity of all such permits, licenses and clearances.	
6.	Are there any recent fines or penalties issued by the regulatory body? If yes, mention the nature of violation, amount of fine/penalty paid, action taken by the SME to address the issue to avoid any such fine/penalty in future	
Environmental and Social Monitoring		
6.	Was there was any incidence of accidents, spills, leakages, explosions, etc. during the reporting period. If yes, what was the scale of damage (e.g., if there was any fatality, monetary loss etc.)? What was the action taken in response to the incident?	
7.	Were there any Occupational health & safety incident? If yes, what was the extent of injury–minor, major or fatal? What was the action taken in response to the incident?	
8.	Were there and community health and safety incidents? If yes, what were those? What was the action taken in response to the incident?	
9.	Were there any incidents related to biodiversity- accidental animal kills, poaching, felling of trees by the Contractor without permission etc? If yes, please mention the details and what course of action was taken to rectify, avoid these	
10.	If there are any new E&S risks or adverse impacts observed due to SME's operation. Mention the types of new E&S risks, possible cause for such new E&S risks, and any mitigation actions undertaken by the SME's to address these additional risks E&S risks.	
Grievance Redressed		
10.	Is there a functioning Grievance Redressed Mechanism?	

	Are there any recent complaints, grievance or protest received from local communities? If yes, has this been recorded? How the complaint was made- verbal, written etc? Specify the nature of grievance; actions taken by the SME to resolve the grievance and if there are any outstanding/unresolved issues.	
Other Information		
12.	Any other information pertaining to environmental and social that need to be recorded and dealt with. Any environment and social beyond the agreed action (eg, energy saving equipment etc) that might be relevant.	

ANNEX 8: TEMPLATE OF PFI ON E&S RISK MANAGEMENT REPORTING

Name of the bank (PFI)	

Prepared by:		Designation/Department	
Contact (email, phone)			

I	Policy Formulation and Governance	Yes/No	Date	Remarks
1.1	Formulation and Board Approval of an ESRM Policy (or similar policy document)			
1.2	Formulation and Board Approval of an ESRM Manual			
1.3	Nomination of an E&S Officer			
1.4	Formulation of GRM guidelines/procedure			
1.5	Formulation of SEA/SH CoC and GRM guidelines/procedure			
1.6	Nomination of Grievance focal person			
1.7	Nomination of SEA/SH Grievance focal person			

2	Employee Trainings and Capacity Building	Quarter I	Quarter 2	Quarter 3	Quarter 4	Total	Remarks
2.1	Allocation of fund in the budget for ESRM Training Programs/Seminars/Workshops (in NPR)						
2.2	No. of ESRM Training Programs/Seminars/Workshops conducted in the given quarter						
2.3	No. of attendees of the ESRM Training Programs/Seminars/Workshops conducted in the given quarter						

3	Incorporation of Environment & Social Risk in Core Risk Management	Quarter I	Quarter 2	Quarter 3	Quarter 4	Total	Remarks
3.1	No. of loan requests rejected due to the exclusion list						
3.2	No. of Transactions subject to Environmental & Social Due Diligence (ESDD)						
3.3	Share (% total loan value) of the transactions subject to ESDD in the total disbursed commercial (business purpose) loan portfolio						
3.4	Total No. of disbursed transactions by E& S Risk Rating						
	Low						

	Medium						
	High						
3.5	Total Amount in disbursed transactions by E&S Risk Rating						
	Low						
	Medium						
	High						
3.6	No. of transactions with specific E&S Action Plan:						
3.7	No. of transactions rejected on the E&S risk management grounds:						
3.8	No. of transactions beneficial to E&S improvements						
	Renewable energy projects (e.g. hydro power plants, solar panels, biogas plants, wind power)						
	Energy Efficiency projects (e.g., efficient lighting, heating/cooling, ventilation, cleaner boiler retrofitting, facility upgrades)						
	Effluents (Wastewater) treatment plants						
	Water recycling and reuse						
	Water consumption reduction						

ANNEX : CONSULTATIONS RECORDS

Nepal Clean Air and Prosperity Project (NCAP)
ESMF and SEP Meeting Notes on Project Component 1 Organized by Ministry of Industry, Commerce and Supplies (MoICS) at Hotel Basera
November 4, 2025

Discussion Summary

Objective of the consultations: to introduce the project to interested parties, discuss project design and environmental and social impacts, and proposed mitigation measures described in Environmental and Social Management Framework (ESMF) and Stakeholder Engagement Plan (SEP). ESMF and SEP were prepared for this project.

List of Stakeholders (Component 1 led my MoICS)

- Ministry of Industry Commerce and Supplies
- Nepal Electricity Authority
- Federation of Forest Based Indutries and Trade, Nepal (FenFIT)
- Shiva Baba Fabric Pvt. Ltd.
- Nepal Dana Udhyog Sangh
- Federation of Community Forestry Users Group, Nepal (FeCoFUN)
- Federation of Nepalese Chambers of Commerce and Industry (FNCCI)
- Nepal Rastra Bank (NRB)
- Department of Labour and Ocuupational Safety (DoLOS)
- Janda Devi Nepal Energy Pvt. Ltd.
- Department of Industry (DoI)
- Saria Biomass Energy Pvt. Ltd.
- Special Economic Zone Authority
- Khowpa Ceramics Pvt. Ltd.
- Confederation of Nepalese Industries (CNI)
- Federation of Nepal Brick Industries
- Industrial Zone Management Limited
- Business Oxyzen Private Equity Ventures
- Department of Environment
- Municipal Association of Nepal (MuAN)
- Alternate Energy Promotion Centre (AEPC)

Environmental and Social Framework (ESMF)

- NCAP project is planned to be implemented with support from World Bank. The primary objective of the project is improvement of air quality in the project intervention areas. The priority area for project intervention are Kathmandu Valley and Terai.
- The project has basically two components. Component 1-Accelerating Cleaner Production in targeted enterprises which will be implemented by MoICS and Component 2- Strengthening Air Quality Monitoring planned to be implemented by Department of Environment (DoE).

- The project objective is commendable. However, shifting to electric boilers is challenging because of high energy demand and unstable electricity supply. Electricity supply and voltage fluctuation is the major concern for switching towards electric boilers. Though boilers are cheap but demands high energy and therefore the cost of production may be higher due to frequent power-cut.
- Forest fires are major contributors to air pollution in Nepal. Women groups are operating bio-mass based small enterprises that produces bio-briquettes that contributes in forest fire control. The project also needs to support these types of small enterprises that are using forest bio-mass as raw material so that forest fire can be minimized.
- Has project considered bio-briquettes as cleaner energy source? Will project only support existing industries/enterprises in operation or will also support new industries?
- The industries in eastern terai use burned Mobil in the industry which contributes in air pollution. It is mainly practiced by Dalmot (Snaks) and Aluminum industries. This needs to be immediately controlled.
- Large industries currently reliant on coal are the primary sources of air pollution and should gradually transition to using bio-briquettes and pellets to reduce emissions.
- The Government of Nepal (GoN) should promote operating shared tunnels for 10-15 industries for promoting transformation towards clean energy. Presently, the brick Kilns operating clean tunnel are financially in debt due to market insecurity. Government should support such industries for promoting and opting cleaner technology. GoN should provide subsidies/ financial incentives for such brick factories for transforming towards cleaner air technology.
- The project objective is excellent but until mechanism for revenue generation from carbon is not established then transformation towards cleaner technology may not materialize as expected.
- The presented documents do not spell on carbon calculation. Internationally, there is industrial practice for monthly, bi-yearly and yearly carbon calculation. It would be better if the project also includes carbon auditing.
- In the recent GIZ-funded program, unreliable electricity supply forced industries that had previously switched to electric boilers to revert to diesel-powered ones. Due to the instability of the power supply, these industries must also maintain diesel generators as backup even after transitioning to electric boilers.
- The industries who have opted briquettes/pellets have reported 50% increase in efficient cost production.
- The adoption towards cleaner technology can be made only through bulk intervention. GoN should make policy intervention for bulk transformation towards cleaner energy adoption in Special Economic Zone.
- The cost for coal and rice husk is way cheaper than electricity and pellets specially in the terai areas adjoining India. Therefore, at present market condition, switch towards cleaner technology may be feasible in mid-hill but may not be feasible in terai areas. Therefore, policy intervention is required for adoption of cleaner air technology in terai areas.
- There are 19-20 private equity and venture capitals in Nepal that can invest in various sectors apart from Banks. These private organizations are investing in new-start ups as well small and medium enterprises. GoN should take energy-mix policy for market security of small enterprises, women groups, alternative energy producers that are manufacturing pellets and bio-briquettes.

- Sustainable supply of alternative and renewable energy for industries and market security for alternate energy producers needs to be materialized for the transformation towards cleaner energy
- There are 2500 small scale forest-based enterprises in Nepal. Few entrepreneurs are also planning to start forest-based enterprises that convert soft woods through seasoning and treatment to hard woods for furniture. But the requirement of IEE/EIA have delayed in start of operation. It is recommended to remove the requirement of IEE/EIA for operating such enterprises as this sort of enterprises doesn't cause significant environmental impact.
- IEE/EIA is required for capital increase of any enterprises and this provision directly contribute towards cost escalation as well time delay in completion of same project that required additional investment. This sort of policy will hamper investment companies bringing Foreign Investments. Therefore, such provisions should be revised.
- NRB has endorsed ESRM guideline to bank and financial institution in 2018 which was further revised in 2022 to assess the environmental and social risk during credit lending. It also included exclusion criteria where financing is restricted to sector having significant environment and social risks (from NRB representative)
- Detail check for assessing environmental and social risk for credit extension is also included in the ESRM (from NRB representative))
- NRB supervisors review on the compliance of E&S risk mitigation while Bank portfolio review (from NRB representative).
- Central Banks worldwide and NRB major guiding policy is Basel Framework which guides the bank financing or investment based on risk assessment (from NRB representative).
- Incentivizing greener technology through lower interest cannot be made until green sector is proved to be less risky. However, other ways such mandatory credit investment in green sector through policy review can be done. Further, private sector are independent on credit investment based on the risk assessment.
- To ensure a reliable electricity supply, the project should prepare regional and seasonal electricity demand projections. These projections must be developed in consultation with the Provincial and Local Offices of the Nepal Electricity Authority (from NEA representative).
- DoE is the implementing government agency for component 2 and this component covers air quality monitoring. DoE is currently operating 30 monitoring stations but due to lack of technical capacity, required equipments DoE is lagging in operating all the stations. NCAP will support upgrading of existing monitoring stations as well installation of new monitoring stations, strengthening air quality monitoring capacity and establishment or upgrading of DoE laboratory. DoE is also planning to organize stakeholders' consultation program and is currently mapping the stakeholders.

Response from Ram Chandra Poudel, SDE, MoICS (E&S Focal Person) on ESMF

- The project will help replace old traditional boilers with electric ones. It will also support industries that choose cleaner technologies, such as using pellets or briquettes instead of traditional fuels. In addition, the project will provide technical and financial support for installing pollution control equipment.
- Project will provide grant in up-front capital cost for installation of transformers, transmission lines, auxiliary electric equipment's to those industries transforming to electrical boilers

- Policy for mandatory use of pellet/bio-briquettes in boiler industry will possibly be addressed by GoN in future.
- Terminal depreciation will be provided to those enterprises shifting to cleaner energy boilers that will contribute in additional investment capital for such enterprises/industries. Additionally, project has proposed Income Tax Exemption for next five years to those enterprises/industries shifting to cleaner technology and this is one of the performance-based criteria of the project.
- The hydro-energy production is increasing and adequate electrical energy for industries is available. However, there is problem in transmission and distribution system, voltage fluctuation. The project has also planned to support upgrading of feeder lines, dedicated lines, transformers, backup supply in dense industrial area. MoICS will coordinate with NEA for reliable supply of electrical energy.
- Project is targeted in supporting SMEs but will not support brick industries

Stakeholders Engagement Plan

- The SEP should include awareness programs for target enterprises so that all of them get proper information.
- Stakeholders from the education sector; such as universities, research institutions, and research experts; should also be part of these engagement programs.
- It would be better to include specific women's groups, NGOs, and community-based organizations (like FECOFUN) as relevant stakeholders through proper stakeholder mapping.
- In principle, the GRM is good, but experience shows it has not worked as expected. The existing GRM systems in the GoN should be linked with the project's GRM to make them more effective.
- These type of stakeholder consultations should also be organized at the provincial level.
- Since local municipalities are concerned about clean air, these programs should, where possible, reach the ward level.
- The project documents should show coordination and cooperation among the three levels of government during implementation

Response from Ram Chandra Poudel, SDE, MoICS (Focal Person) on Stakeholder Engagement Plan

- Academic institutions are in the Project Sterring Committee (PSC), the apex body of the project. Participation of academic institution is ensured in PSC meeting, budget approval and multi-sectoral meetings
- MoICS has conducted assessment on boiler operating enterprises and will provide the report to relevant stakeholders as project goes into implementation.
- The project GRM is formed to address the project related grievances. The Good Governance Act has provisioned focal person in every government office to handle grievances under its jurisdiction.
- Project will directly coordinate and collaborate with local units in the course of project implementation.

Response from Krishna Bahadur Raut, Secretary, MoICS for overall concerns and suggestions

- Nepal's total installed power capacity is expected to reach 5,500 MW by 2027, and the NEA is implementing programs to increase electricity consumption. Switching to electric boilers will therefore be both sustainable and effective. The GoN also follows an energy-mix policy to ensure national energy security. The energy-mix policy will help secure markets for pellet and bio-briquette manufacturers that use cleaner technologies.
- The GoN promotes private investment for sustainable growth. Since last fiscal year, it has introduced innovative start-up credit programs offering loans at only 3% subsidized interest.
- MoICS has suggested to MoFE that IEE/EIA requirements for industrial upgrades should be based on risk levels rather than project cost thresholds.
- A 20% subsidy on total capital investment is currently under discussion as part of ongoing project planning.
- MoICS will hold joint discussions with the World Bank, Nepal Rastra Bank (NRB), and the Ministry of Finance (MoF) to determine a base rate for long-term industrial loans.
- About 10–15 years ago, NRB offered 3–4% lower interest rates for the manufacturing sector compared to consumption loans. The current policy favors consumption loans, so MoICS will consult stakeholders to review interest-rate policies for the manufacturing sector.
- The MoFE is looking into the forest fire issues through other programs The NCAP project focuses on promoting cleaner technologies and strengthening air-quality monitoring systems only.
- MoICS will enhance industrial monitoring to ensure compliance and sustainability.
- The GoN plans to allow industries in Industrial Management Districts and Special Economic Zones to install rooftop solar panels to ensure energy security during power outages.
- To reduce pollution from coal and husk, the GoN will use both incentives and penalties. Under the Industrial Enterprise Act and related laws, custom duty for machinery using cleaner fuels is fixed at 1%. MoICS will propose further exemptions on machinery and equipment imports for energy-conversion industries in the next fiscal year.
- A carbon-trading mechanism exists but is not yet in operation. The GoN plans to formally adopt a carbon-trading policy soon to promote low-emission industries.
- The project is still in the preparatory stage, and stakeholder mapping will be completed before implementation.
- Since most SMEs fall under provincial and local governments, these authorities will be engaged and coordinated once the project implementation is confirmed.

Nepal Clean Air and Prosperity Project (NCAP)
ESMF and SEP Meeting Notes on Project Component 2 Organized by Department of Environment (DoE) at Hotel Basera
November 13, 2025

Objective of the consultations: to introduce the project to interested parties, discuss project design and environmental and social impacts, and proposed mitigation measures described in Environmental and Social Management Framework (ESMF) and Stakeholder Engagement Plan (SEP). ESMF and SEP were prepared for this project.

List of stakeholders (Component 2 led by DoE)

- Ministry of Forest and Environment (MoFE)
- Department of Environment (DoE)
- Department of Roads (DoR)
- Department of Agriculture and Livestock (DoAL)
- Federation of Nepal Cottage and Small Industries (FNCSI)
- Nepal Electricity Authority
- Central Department of Environmental Science, Tribhuvan University
- International Centre for Integrated Mountain Development (ICIMOD)
- World Health Organization (WHO)
- Kathmandu Metropolitan City (KMC)
- Lalitpur Metropolitan City (LMC)
- Chandragiri Municipality
- Air Pollution Researcher and Experts

Issues and Suggestions

- Strengthening of project documentation on air pollution sources: traffic, dust, waste burning, agriculture residue, forest fires, indoor pollution, and transboundary pollution.
- Nepal should have strong cooperation with India for controlling transboundary air pollution issues.
- Nepal should brand its green energy with India during bilateral cooperation for promoting use of cleaner energy
- Strong enforcement policies need to be enacted to control burning of solid waste, agriculture residue, burning of tires during revolution
- Apart from upgrading and maintenance, sustainability of air quality monitoring stations needs to be ensured
- Alternatively, low-cost sensors such as locus sensors can be installed and data can be integrated in the DoE database.
- Suggest to upgrade the monitoring stations that can provide air monitoring data based on source (local/regional/transboundary).
- The project should clearly reflect the coordination mechanism between all three level of governments. Since, local government are one of the responsible government units, their capacity development in air quality monitoring and enforcement needs to ensured.

- The project should clearly specify the activities that will be implemented for and through local units.
- How can the project be linked with the local unit labour desk so that labours can be linked in the project's employment opportunities.
- The ESMF should incorporate the possible risks from floods/landslides/slope stability as some of the monitoring stations are in flood plain and slope area
- ESMF should also incorporate possible accidental risks from fencing of monitoring stations. Local level sensitization can be proposed as the mitigation measures and sensitization program needs to be included in project.
- The ESMF needs to include GESI issues and possible measures to address the issues.
- Possible interested parties suggest different meanings therefore suggested to use appropriate words such as responsible party as this the responsibility of government
- The stakeholder list should aslo include NDRRMA, SMEs, health sector, scrap dealers, farmers, ICIMOD, security agencies, and special groups.
- Special engagement plan needs to be prepared for engagement with special groups such as scrap dealers, cleaning group etc.
- Leaflet of success stories dissemination to the stakeholders for awareness raising may be helpful
- Communication through local units will be more impactful
- GRM should be functional throughout the project. 15 days timeline to address all types of grievances may not be feasible or appropriate.
- Ensure strong enforcement against burning practices; consider long-term and real-time enforcement.
- Resources needs to be allocated for research, education, awareness, and local-level communication.

Response from Deepak Gyawali, Under Secretary, DoE

- The main goal of the project is to improve the air quality standards of Nepal
- The project is of small scale and potential E&S risks from implementation of this component is minimal
- DoE will improve the ESMF and SEP document addressing the project relevant comments and suggestions received from the stakeholders
- Enforcement of air quality monitoring standard process is broadly discussed and will be critically discussed in coming days

Response from acting Secretary, MoFE

- All the stakeholders are requested to provide written comments to the DoE through email or other feasible sources
- DoE is responsible for endorsing air quality standards and monitoring only. There are other sectoral agencies that looks into different sectors contributing to the air pollution.
- Regional issues/transboundary issues required diplomatic approach and GoN is continuously engaged in addressing transboundary issues through diplomatic approach.
- MoFe and DoE will coordinate with concerned government agency for inclusion environmental parameters for local unit evaluation

- The environment sector requires coordination and collaboration with provincial and local governments and therefore federal government entities is committed in coordination and collaboration with provincial and local governments.