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THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

MINISTRY OF SCIENCE AND TECHNOLOGY

NATIONAL QUALITY INFRASTRUCTURE DEVELOPMENT PROJECT

Environmental and Social Management Framework (ESMF)

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Acronyms

AAEPA	Addis Ababa Environmental Protection Authority
CBOs	Civil Society Organizations
CPC	Cleaner Production Center
CSOs	Civil Society Organizations
DAkkS	Calibration Certificate for Instruments and Equipment
ECAE	Ethiopian Conformity Assessment Enterprise
ENAO	Ethiopian National Accreditation Office
EPA	Environment Protection Authority
ELA	Ethiopian Laboratory Association
ERPA	Ethiopian Radiation Protection Authority
ESA	Ethiopian Standards Agency
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
IAEA	International Atomic Energy Agency
FMHACA	Food, Medicine and Healthcare Administration and Control Authority of Ethiopia
GAP	Gender Action Plan
GDP	Growth Domestic Product
GoE	Government of Ethiopia
GoE	Government of Ethiopia
GRM	Grievance Redress Mechanism
GTP II	Growth and Transformation Plan
IEC	International Electro-technical Commission
ILAC	International Laboratory Accreditation Cooperation
ISO	International Organization for Standardization
M&E	Monitoring and Evaluation
MEFCC	Ministry of Environment, Forest and Climate Change
MoI	Ministry of Industry
MoST	Ministry of Science and Technology
MoT	Ministry of Trade
MRA	Mutual Recognition Agreement
NMIE	National Metrology Institute of Ethiopia
NQI	National Quality Infrastructure
NQIDP	National Quality Infrastructure Development Project
OP/BP	Operational Policy/Bank Procedure
OSH	Occupation Safety and Health
PIC	Project Implementation Committee
PM	Policy Manual
PMU	Project Management Unit
PPE	Personal Protective Equipment
STC	Standard Technical Committee
WBG	World Bank Group

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Executive Summary

National Quality Infrastructure Development Project (NQIDP) is being designed to support the Government of Ethiopia (GoE) with the objective of addressing the major challenges concerning quality and standards in the country. The Project is anchored within the framework of the World Bank Group (WBG) current engagement on the industrialization agenda of the country to support the GoE to achieve its strategic objective of becoming "the light manufacturing hub of Africa by 2025". NQIDP contributes to Ethiopia's expected outcome of improved quality system, which in turn has positive impacts on the country's ambition of achieving accelerated and sustained growth.

Ethiopia's National Quality Infrastructure (NQI) faces many development challenges; the main ones include lack of capacity to provide quality and standards services, poor product differentiations, inability to meet target market standards, poor protection of public good elements, and prohibitive costs of compliance with international standards. While the project will not be able to address all the challenges, it aims to focus on the key interventions to improve the delivery of NQI services to contribute to the country's export focused manufacturing led development strategy as long-term objectives. The interventions will include, among others, developing the NQI institutions for international accreditation and mutual recognition with target markets, streamlining technical regulations and voluntary standards, building product traceability systems, enhancing the capacity for technical regulations and inspections, assessment of demand for NQI services and creating awareness about NQI services.

Hence, NQIDP is designed to strengthen NQI in Ethiopia in line with international standards and best practice so as to address the main development challenges related to NQI. The project has three interconnected components: (i) Component 1: Support to Institutional and Regulatory Development; (ii) Component 2: Support to Private Sector Engagement; and (iii) Component 3: Project Management and Monitoring and Evaluation. Addressing different gaps in the supply and demand side of the NQI services, each component will leverage the inputs and outputs of other project components to ensure that the development objective of the project is realized in an integrated manner.

The NQIDP proposed to cost US$50 million. The project is complementary to the ongoing WBG initiatives and within the framework of the industrialization program. It will work in the intersection point of the different ongoing interventions, where the issues and challenges around quality assurance have been identified to undermine the private sector competitiveness, trade and the growth of small and medium enterprises which are the founding blocks of the GoE's growth strategy.

The purpose of this Environmental and Social Management Framework (ESMF) is to provide a process to assess potential environmental and social impacts of the NQIDP. For all NQI development project activities, it will be important to ensure that potential negative environmental and social impacts are minimized, while striving to enhance benefits for the project beneficiaries and the environment. The ESMF provided a comprehensive framework on how to address potential adverse social risks and environmental impacts related to the project during its implementation.

Consultative meetings, discussions and interviews were held with various stakeholders between 28 September and 10 November 2016 covering all NQI institutions, private sectors, and Civil Society Organizations (CSOs). NQI institutions participated in the consultation

included the National Metrology Institute of Ethiopia (NMIE); Ethiopian Standards Agency (ESA); Ethiopian National Accreditation Office (ENAO); and Ethiopian Conformity Assessment Enterprise (ECAE). Fifteen private sector entities involved in leather production, textile and garments, and agro-processing were consulted. To list some, among these, are K.O.JJ Food Processing Complex Plc, Addis Modjo Edible Oil Complex Share Company, Tomoca Coffee Plc, EDE Garments and Textile Plc, Wosi Garments Sol Property, ELICO-Awash Leather Factory, Batu Tannery Plc, Wosi International Fashion design, etc. Ethiopian Laboratory Association (ELA) is one of the CBOs consulted. Interviews were conducted with the core NQI development project designing team members of Ministry of Science and Technology (MoST). The consultation, discussion, and interviews were arranged mainly by the team of consultants and an assigned focal person from the Ministry of Science and Technology. The aim of the consultation was to identify possible environmental and social impacts of the project and based on the findings recommend relevant mitigation and enhancement measures to ensure environmental and social sustainability of the project. Accordingly, a range of positive and negative impacts was identified. Some of the positive environmental and social impacts that need to be enhanced include: i) overall contribution to the macro-economy; ii) creation of novel forms of business opportunities and enhanced competitiveness; iii) enhanced social accountability of firms; and iv) enhanced services for women.

The implementation of the NQIDP will not entail major environmental impacts as most activities are confined to existing premises of the NQI institutions. However, minor impacts are foreseen in relation with renovation/refurbishment of existing facilities such as laboratories/office buildings and procurement of specialized laboratory and testing equipment. The impacts include: i) air pollution; ii) soil pollution; iii) occupational safety and health hazards and fire hazards; iv) radiation hazards (mainly associated with testing of product specimens); and v) impacts from road vibrations that may have negative implications on NQI operations. Accordingly, the Project triggered only the safeguard policy on environmental assessment (OP/BP 4.01) to address these and other related impacts.

There is no pesticide use within the scope of the project and hence OP/BP 4.09 is not triggered. Besides, because of the site-specific nature of the NQID (located in Addis Ababa NQI offices), there are no identified potential negative social impacts of the project at community level related to displacement and loss of assets. The project activities do not require land; and land acquisition does not occur during the implementation of subproject activities. Hence, OP/BP 4.12 on Involuntary Resettlement is not triggered. However, there are minor potential social risks that may affect the successful implementation of the project such as i) conflict or disagreements that could emanate from competition among workers for capacity development training; ii) staff turnover in NQI institutions that may affect the successful implementation of project; and iii) likely exclusion of women staffs from capacity building activities envisaged under the project. All the project impacts are anticipated at later stages - mostly during the implementation phase of the project. However, all these impacts are reversible in nature, and can be mitigated through proper planning and mitigation actions. The actions that ought to be considered during project implementation are identified and indicated in the monitoring plan. It is anticipated that the total cost of mitigating these environmental and social impacts is approximately Birr 38,317,125.00 (around 1.7 million USD). Thus, the cost of managing possible negative impacts is about 3. 4% of the total project cost.

NQI development project needs to be gender responsive to empower women and ensure equitable benefits to women and men. To mainstream gender and address gender inequality

during project implementation and monitoring and evaluation, Gender Action Plan (GAP) is prepared. The GAP will ensure empowerment of women in the project focusing on: (i) ensuring women's equitable participation in project implementation consultative meeting; (ii) conduct gender inclusive capacity development; iii) incorporating gender-responsive design features during NQI infrastructure development and services provisions; and (iv) strengthening the implementing agencies' institutional capacities for gender mainstreaming and women empowerment. Grievance Redress Mechanism (GRM) provides a formal avenue for affected people to gage their concerns or adverse environmental and social impacts to the implementing agency to get solutions on time and a cost effective manner. The objective of the GRM is to ensure that the views and concerns of those affected by NQIDP activities are heard and acted upon in a timely, effective and transparent manner. Ethiopia's NQI institutions, in one way or another, are member of, and/or regulated by international quality infrastructure institutions in the world. They are mentored and inspected by various international infrastructure institutions working in areas of quality infrastructure and complainant/ conflict handling. Hence, NQI institutions manage conflicts/ complaints in an organized and transparent manner, and are currently well functioning. All cases and the ways they were addressed are registered and documented. Conflicts related to NQIDP will be addressed using the existing conflict management mechanisms functioning in NQI institutions.

1. Introduction

1.1 Background and Context

Ethiopia is located in the Horn of Africa and is a land-locked country with an area of 1.1 million km^2. Ethiopian population is estimated at 96.95 million, with annual population growth rate of 2.5 percent. The country has been experienced rapid and stable economic growth over the past decade. For instance, according to the official data, between 2004 and 2014, on average, the Growth Domestic Product (GDP) growth is10.9 percent per annum. This growth rate between 2004 and 2014 is the fastest that the country has experienced and is above the average achieved by low-income and Sub-Saharan African countries.

To maintain this growth, the GoE is currently implementing the second phase of the Growth and Transformation Plan (GTP II). GTP II sets out an ambitious development vision that seeks to turn Ethiopia into a middle-income country by 2025, with an average growth rate of 11 percent per year during the implementation period (2015/16 to 2019/20) underpinned by robust growth of manufacturing output and export.

Ethiopia's economic growth was driven primarily by structural improvements supported by the conducive external policy environment of the government. Since then, the country exports quadrupled in nominal terms, while volumes doubled, reflecting a substantial positive commodity price effect. Nevertheless challenges remain to sustain its growth. When compared to other countries in the region, Ethiopia has one of the lowest participations of industry and manufacturing in GDP. Poverty is just as prevalent in Ethiopia's two largest cities (Addis Ababa and Dire Dawa) as in rural areas, and is strongly associated with unemployment. Poverty rates in the two cities are close to 30 percent and unemployment in the capital is 24 percent.[1]

During the early stages of industrial development, because of the potential for higher productivity in the manufacturing sector and the manufacturing sector's utilization of predominantly unskilled and semi-skilled labor, the movement from agriculture to manufacturing tends to benefit the poor. By focusing on improving production, productivity and quality of manufacturing output[2], GoE aims to increase manufacturing jobs on average by 15 percent annually from 380,000 in 2014/15 to 758,000 by 2019/20. In this regard, women and youths will be the primary beneficiaries of the job opportunities to be created. To achieve the vision envisaged in the GTP II, GoE has developed a set of strategies focusing on infrastructure development, skills development, productivity increase and competitiveness of the private sector, particularly in manufacturing.

To support rapid economic development underpinned by strong growth of manufacturing, the delivery of quality and standardized products and services to local and international markets is critical. Ethiopia's private sector faces a formidable array of challenges to increase its competitiveness. Over and above the constraints on trade logistics, access to finance and industrial land, one of the major stumbling blocks is the

[1] According to CSA, the midyear population estimate is 90.1 million in 2015.

[2] GTP II has identified seven manufacturing industries, as priority sectors: (i) Textile and Garment; (ii) Leather and Leather Products; (iii) Metal and Engineering; (iv) Meat, Milk and Honey; (v) Chemical and Construction Inputs; (vi) Agro-processing; and (vii) Pharmaceuticals.

attainment of the quality and standards of products and services demanded by global trading partners and customers. Certain quality standards allow trading partners and consumers to assess the quality of goods and services before purchasing them and put pressure on producers to comply with requirements.

Science, Technology, and Innovation Policy designed by GoE points out a failure to meet the quality standards as one of the major issues prevailing in most of local manufacturing and service providing enterprises in Ethiopia. Recognizing the importance of quality assurance, GoE has embarked on a reform agenda to upgrade Ethiopia's NQI to deploy appropriate production technologies and other value addition processes to ensure that all goods and services for international and domestic markets meet the required quality, environment, health and safety standards. NQI is commonly understood as the institutional framework that establishes and implements the practice of standardization, including conformity assessment services, metrology, and accreditation.

The World Bank Group's Country Partnership Strategy (CPS, FY13-16) builds on the progress achieved by Ethiopia in recent years and aims to help GoE address structural transformation and support the implementation of the GTP. Hence, NQIDP was designed that would contribute to the development and growth of the manufacturing sector, and its global competitiveness by supporting the upgrading of quality and standard system in Ethiopia. As the requirement and the base for the appraisal of NQIDP, this ESMF was prepared.

1.2 Purpose and Objective of the ESMF

This ESMF was prepared to serve as a safeguard instrument to ensure that the environmental and social impacts of the NQIDP to be financed by the World Bank are properly considered during project design and implementation. The ESMF guides designing of appropriate measures and plans to reduce, mitigate and/or offset adverse impacts and enhance positive outcomes including benefits for project beneficiaries and the environment. This ESMF thus provides a comprehensive framework on how to address potential adverse social and environmental impacts related to NQIDP project activities (or subprojects) design and implementation.

After undertaking appropriate assessments into the likely social and environmental impacts of the NQIDP, the ESMF has proposed relevant mitigation and enhancement measures and strategies to be considered during the project activity design and implementation. Additionally, the framework provides for a mechanism for screening, managing and monitoring the likely environmental and social impacts that may emanate from the project activities at the implementation phase.

The objectives of the ESMF are to:

- Establish clear procedures and methodologies for integrating environmental and social issues in planning, review, approval and implementation of subprojects to be financed under the NQIDP;
- Specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and social concerns related to the NQIDP;

- Determine the training, capacity building and technical assistance needed to successfully implement the provisions of the ESMF;
- Establish the budget required to implement the ESMF; and
- Provide practical resources for implementing the ESMF.

In this ESMF, gender mainstreaming and women empowerment action plan was also prepared to address issues of gender equality during project implementation, monitoring and evaluation.

1.3 Methodology of ESMF Preparation

The ESMF was prepared using a mixed approach. Both qualitative and quantitative research approaches were used to collect valid and reliable data from different government offices and beneficiaries of the project.

Relevant literature were reviewed to grasp the legal and regulatory frameworks of the World Bank OPs and the GoE rules and regulation related to environmental and social safeguards. Moreover, published and unpublished documents of project implementing agencies regarding their staff profile, work reports, evaluation reports, etc. were reviewed. The materials that were consulted include NQIDP appraisal documents; World Bank safeguards policies; Government policies, strategies, legal frameworks, and institutional setup; and National GTP II.

Besides, primary data collection methods were employed to gather qualitative data to meet the objectives of the ESMF. To verify and validate the data obtained through triangulation, the following methods were used: key informant interviews (KII), group discussions, consultative meetings and field observation.

Government officials and/or experts from relevant federal ministries, agencies and/or offices, which are responsible to and concerned with NQIDP were part of the interviews. KII were conducted with selected stakeholders, including department heads, agencies and office managers, experts, team leaders, etc., who are directly and indirectly affected with the implementation of NQIDP activities.

Consultative meetings were held with concerned stakeholders such as ESA, ECAE, NMIE and ENAO, CBOs such as ESA, and private sectors to solicit their views and concerns about the proposed project; aware the objectives and components of NQDP, and the ESMF. Besides, the consultative meetings enabled to investigate the gender dimensions of the project; identify environmental and social issues as well as relevant mitigation measures to ensure environmental and social sustainability of the project. Above and beyond, during the consultation, stakeholders were oriented about the objective of the proposed project, including its components and subcomponents and allowed to express their concerns and worries, which may deter project implementation.

Fifteen businesses involved in leather production, textile and garments, and agro-processing were consulted. These included EDE Garments and Textile PLC, Wosi Garments Sol Property, ELICO-Awash Leather Factory, Batu Tannery PLC, Wosi International Fashion design, etc. Ethiopian Laboratory Association (ELA) is one of the CBOs consulted. Interviews were also conducted with the core NQI development project designing team members of Ministry of Science and Technology (MoST).

2. Project Description

2.1 Project Objective

The overall aim of Ethiopia's NQIDP is to improve the delivery of quality assurance services to enterprises by strengthening Ethiopia's national quality infrastructure.

2.2 Project Components

The project has three interconnected components: (i) Component 1: Support to Institutional and Regulatory Development; (ii) Component 2: Support to Private Sector Engagement; and (iii) Component 3: Project Management and Monitoring and Evaluation..

Component 1: Strengthening Institutional Capacity - The objective of this component is to strengthen NQI institutions' capacity to deliver the demanded services to enterprises. This component will focus on two main areas of interventions: (i) supporting the development of human and technical capacity of NQI institutions; and (ii) much-needed upgrading of service facilities. By doing so, the component will provide support for the Ethiopian Standards Agency (ESA) to act as the national standards enquiry point, improve the National Metrology Institute of Ethiopia's (NMIE) calibration services to support businesses, strengthen the capacity of the Ethiopian National Accreditation Office (ENAO) to provide accreditation services, strengthen the Ethiopian Conformity Assessment Enterprise (ECAE) for providing inspection, testing, and certification services and strengthen the technical regulation and inspection capacity at the Ministry of Trade. This integrated approach will ensure conformance of goods and services to international standards and technical regulations, and enhance Ethiopia's capacity in harmonization and development of standards and technical regulations at international level in areas of strategic importance.

Hence, potential negative environmental and social impacts of NQIDP are related to this component. This pertains to refurbishment of existing buildings, related demolition waste and its management as well as radiation, chemicals and laboratory and testing equipment to be used by NQI laboratories. In this regard, it should be noted that project funds will not be used for the purchase of laboratory chemicals and reagents.

Component 2: Enhancing Private Sector Engagement - The objective of this component is to support the private sector to conform to set standards and to comply with technical regulations. This component will have two main sets of interventions: (i) support to increase the demand from the private sector for NQI services where public-private dialogue on NQI topics would be one medium; and (ii) support to private sector enterprises and associations involved in providing quality assurance services. The component will create awareness in the business community to conform to the required standards, strengthen the capacity of private sector players, sensitize consumers and users about the attributes of quality and compliance with standards and international codes, and adopt quality management systems in their operations.

Component 3: Project Management and Monitoring and Evaluation - This component will aim to ensure efficient and effective implementation of the project. Support will be provided to Ministry of Science and Technology (MoST) and its Project Management Unit (PMU) to strengthen its capacity and increase human resources required for the project implementation. Given the various entities involved in this

project, the MoST is expected to oversee the implementation of the project with the PMU set up within MoST.

2.3 NQIDP Institutional and Implementation Arrangements

NQIDP will be housed in the MoST. The project will be implemented within the premises of the existing NQI institutions that are responsible for the fields of metrology, standards, accreditation, and conformity assessment.

There are a number of stakeholders identified, which will be directly involved during project preparation and implementation. These are mainly NQI institutions established as legally autonomous entities under MoST; namely, NMIE, ESA, ENAO, and ECAE. Also, GoE has created a separate regulatory function within the Ministry of Trade (MoT) to enforce and coordinate technical regulatory activities with responsible line ministries. The Food, Medicine and Healthcare Administration and Control Authority of Ethiopia (FMHACA), which is legally mandated, among others, to issue, renew, suspend and revoke certificate of competence for specialized health institutions, food and medicine processing plants, quality control laboratories, bioequivalence centers, importers, exporters, storages and distributors and trans-regional health service institutions, is also another key stakeholder, which need to be included in the institutional implementation structure of the project. The other institution included in the implementation arrangement is the Cleaner Production Center (CPC), which is intended to oversee compliance of the project with key environmental and social concerns. Currently, the CPC is a Directorate within the Ethiopian Standards Agency. A/A EPA is the other regulatory body consulted for the implementation of this project. It is mandated to issue environmental clearance before a project activity entailing environmental impacts is implemented on the ground. It also reviews and appraises ESMP/ESIA submitted by MoST, and is expected to undertake regular monitoring of the implementation of these documents. On issues concerning radiation, the Ethiopian Radiation Protection Agency (ERPA) is mandated to regulate the procurement and utilization of radiation-emitting equipment.

As outlined on Figure 2-1 below, the MoST will be responsible for the implementation of the Project. A Directorate within the MOST will act, on behalf of the Ministry, as a coordinator of the key actors in the NQI system (ESA, ENAO, NMIE and ECAE). This directorate is the one that is dedicated for NQI development with in the MoST. The Director of this Directorate will be responsible to report to the State Minister or Minister of Science and Technology, as appropriate. The four NQI institutions (including the CPC under the ESA) and the Directorate with in MOST will form the Project Implementation Committee (PIC). The PIC is the key responsible body that sees to the implementation of the NQIDP activities including obligations and tasks emanating from the ESMF.

The chair of the PIC is the PMU. The PIC will follow up on the implementation of the project on a day-to-day basis and meets monthly to review progress. The monthly progress evaluation includes implementation of the agreed work plan, efforts to address challenges, and recommendations taken on emerging issues to the Ministry and other bodies depending on the need for high level support or intervention.

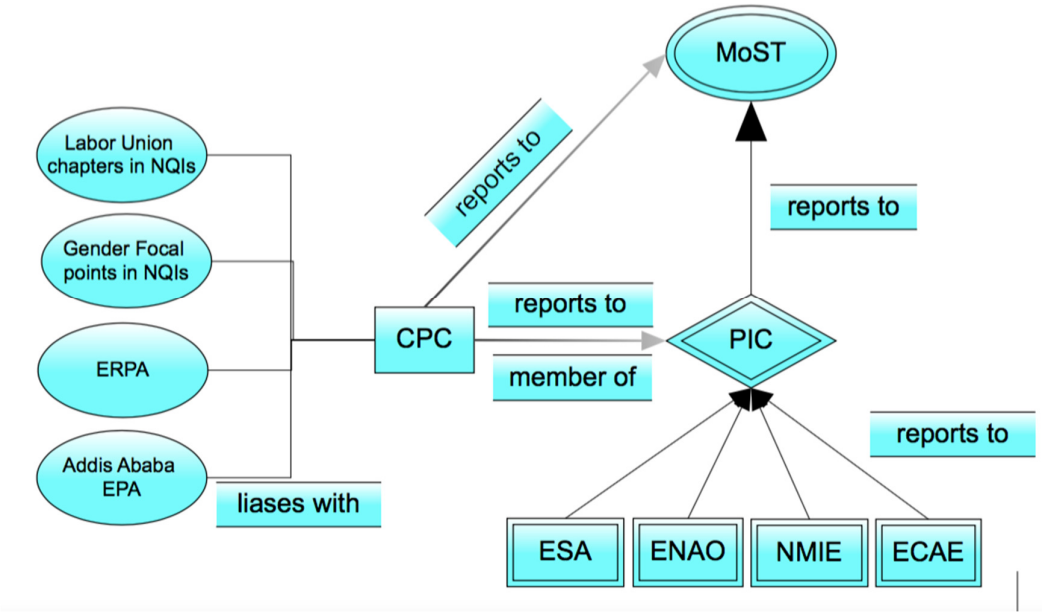

Figure 2-1: Institutional and Implementation Arrangement of the NQIDP

The PIC chaired by the PMU will have mandates over technical matters. All NQI institutions will monthly report to the PIC regarding the progress or challenges faced on technical matters (for instance on identification of equipment to purchase, selection of buildings to refurbish or type of capacity building trainings to deliver etc.). Beside this reporting obligation, all NQI institutions will report to the CPC on environmental and social matters. This may include progress achieved or challenges faced while implementing the mitigation actions envisaged under the ESMF. Both reports should be consolidated (covering both technical as well as social and environmental issues) and presented on a monthly basis when the PIC meets. In addition, the CPC will undertake spot checks and on-site inspections to ensure that social and environmental monitoring is carried out proactively as the project is implemented. The CPC will aggregate these reports and keep its own separate documentation on project progress for regular submittal to the PMU.

The CPC shall oversee whether the project implementation is carried out in compliance with the NQIDP ESMF and the environmental and social safeguards requirements of the GoE and the WB. It shall also serve as an interface with mandated government and non-governmental agencies on environment and social matters. The CPC shall liaise with the Labour Unions within the NQI institutions to ensure proper handling of social and environmental plans during project implementation and advise the Ministry on actions that need to be taken. It also liaises with regulatory bodies like A/A EPA and ERPA on behalf of MoST.

The PIC shall have representation from each of the NQI institutions. However, since the ESA also hosts the CPC at a directorate level, the CPC shall be represented independently as outlined on Figure 2-1 above. This creates a space for the CPC to address anticipated and emerging social and environmental challenges while at the same time actively engaging in project implementation.

3. Environmental and Social Baseline Conditions

3.1 Environmental Baseline Conditions

The NQIDP is planned to be implemented within NQI institutions under the oversight of the MoST in Addis Ababa. There are four NQI institutions or project implementing agencies namely, the ESA, ENAO, NMIE, and ECAE. Except ENAO, the three institutions are located within the same compound in Bole Sub-city alongside the ring road between *Megenagna* and *Gerji Mebrathail*. The compound is situated on a vast space of around 69,404 meter square of land. 45,000 square meters of the total area is occupied by office spaces and laboratory buildings while the remaining 24,404 square meters is a green area. ENAO is located in *Kirkos* sub-city, just near the area known as *Beklobet*. The organization does not have its own building and operates in a rented building facility.

The compound at Megenagna is generally neat and tidy. There are well-maintained green areas between office buildings and laboratory facilities. Some trees of various genres are also planted giving the compound a healthy breeze. There is a dedicated temporary waste storage area at one corner in the compound. A shade is built over it (see Figure 3-1) but with no walls on the sides. Consulted personnel provided information that the purpose for the purpose is to protect the temporarily dumped waste from heavy rain and sunrays while allowing for movement of air. There is a dedicated staff that takes care of waste storage and their removal. All the waste is segregated at this point. Sorting of waste is done within empty containers/ empty barrels dedicated for organic waste; chemicals and packing materials (including empty plastic jars, bottles and jerry cans). However, these containers are not properly labeled to indicate which barrel is for which waste item. Besides, these temporary storage materials are full, sometimes being affected by waste overflow. For instance the brown metallic container, which is used as a storage site, is so full that there is no more a space to fit in any more waste into it (Figure 3-1). Improper dumping of materials that could be recycled is also seen at this site. For instance there is an old refrigerator placed under the shade and occupying space of this temporary dumping site.

Figure 3-1: Temporary waste storage facility within the NQI premises at *Megenagna*

ECAE has six functional laboratories. These are chemical laboratory, microbiology laboratory, mechanical laboratory, textile laboratory, leather laboratory, and electrical and radiation laboratory. Besides, there are six branch laboratories under the oversight and supervision of ECAE. In terms of the service they deliver, all the six branch laboratories have same functionality. However, the building constructed for the branch laboratories vary from one area to another. The construction of four branch laboratories was completed, whereas two laboratories were not yet finalized. Under NMIE, there are seven laboratories functional in measurement parameters. These are 1) temperature calibration laboratory, 2) mass calibration laboratory, 3) electrical, time and frequency calibration laboratory, 4) force and pressure calibration laboratory, 5) radiation/SSDL calibration laboratory, and 6) volume calibration laboratory. All laboratories in both ECAE and NMIE require further upgrading of the existing lab rooms and furnishing with modern lab equipment. These laboratories use Good Laboratory Practices and follow the standards of ISO 17025.

The types of radiation mostly used by NQI laboratories are alpha, beta, gama and x-rays. These are next to visible rays when considered across the light spectrum. These are used only to test product specimens. The radiation laboratory facility is itself built by the Ethiopian Radiation Protection Authority (ERPA) as per the standards of the International Atomic Energy Agency (IAEA). Testing operations are strictly monitored. While administering the tests, it was stated that all forms of protective devices are used. ECAE Participants indicated that the Enterprise has secured competency certificate from ERPA for such operations. For accreditation services (to test whether a product is radiation free) ECAE uses laboratory equipment accessed from the Radiation Protection Authority itself. Appropriate protective devices are used during laboratory tests to ensure that harmful rays don't get into personnel handling the operation. For larger projects (industrial applications), experts from the ERPA come to oversee the operation.

All laboratory wastes are handled using guidance from ISO 17025 and adherence to good laboratory practices. When wastes get accumulated, NQIs intend to use the incineration facilities of cement factories in the country. It was indicated during the consultation that cement factories would use these wastes as fuel inputs. Participants also explained that the NQIs have begun discussions with the cement factories through the ELA.

3.2 Social Baseline Conditions

ESA is responsible to adopt international ISO standards to the local context. It works in line with ISO/IEC 9001/2008 and all of its activities are guided by this ISO standard. Most of ESA's activities are dominated by paper works and less involved in research which other international standard agencies are involved. Since its establishment ESA has adopted over 12,000 standards to Ethiopia. It is certified for Quality Management System by ISO. Each year, ESA is audited by a third party, named DQS based in Germany, which is one of the leading certification bodies for management systems worldwide.

ENAO is engaged in accreditation of private and public sectors evaluating them in line with the national standard adopted by ESA. ENAO is signatory to the Mutual Recognition Arrangement (MRA) of the ILAC on scope of Testing ISO/IEC 17025 and is in the process for certifying itself for quality and competence testing of medical

appliances/ laboratories (ISO 15189) certification, that could enable it to work in the health sector in the country. Additionally, the organization has been evaluated for ISO 17011 with the intention of becoming a member of the Mutual Recognition Arrangement (MRA). Respondents alluded to the current projects' benefit of creating demand among the private sector so that the voluntary testing and certification scheme of ENAO will be well taken by the community. Through the project's activities dumping of sub-standard products that may have dire environmental consequences will be curtailed.

Currently, NQI institutions (particular ENAO) are planning to work in the health sector particularly focusing on Quality Management System and Laboratory accreditation, and personnel accreditation to make the health facilities provide quality services to the community. As a result the community health will be maintained due to access to quality health care.

ECAE's prime mandate is to provide testing, inspection and certificate services to its clients. The organization recognizes and aligns its operations with the standards and compliance parameters of International Laboratory Accreditation Cooperation (ILAC) and other international trade facilitating bodies such as ISO/IEC. ECAE gives certification and testing to local goods and services so that they can be competitive in international markets. Its ultimate aim is to ensure the production of substandard goods. Hence, the institute works to improve trade balance and facilitates international trade of the country enabling the export of standard products. Its activity eliminates low the production of low standard goods that will be dumped in Ethiopian jurisdiction. This is one of the positive environmental benefits of the activities of the agency. The laboratory services that pass through the remits of its accreditation services include water pollution status determination and forest certification.

NMIE under take activities such as traceability of measurements, routine calibration, maintenance of scientific equipment, technical support on installation as well as certification to those that can do calibration services. Through the NQIDP they anticipated to give on-site maintenance to the buildings as well as moving labs (via vehicles). Through the project, the institution wants to fully refurbish a building, i.e., demolish the existing partitions, do waterproofing, and basement reinforcing activities. Since the location of the office is near the ring road, the vibration/ shock may affect their future function. Thus, they need a design of ground floors and buildings that will absorb shocks. They also planned to purchase a number of calibrating equipment. They indicated that 28 % of the total project budget will be paid off to build capacity of the enterprise.

As a basis for its operations, the organization functions as per the standards of ISO. These standards include ISO 17065 on Conformity assessment requirements for bodies certifying products, processes and services; ISO 17020 on General Criteria for the Operation of Various Types of Bodies Performing Inspection; 17021 on Conformity assessment requirements for bodies providing audit and certification of management systems and ISO 17024 on General requirements for bodies operating certification of persons.

The NQI institutions generally lack comfortable working spaces and the laboratory buildings are not properly maintained. Some of the laboratory buildings are not up to

the standard to provide basic services to the clients. As a result, some NQI institutions such as NMIE have already started demolishing existing laboratory structures in order to upgrade one of its laboratories. Figure 3-2 depicts demolished laboratory for upgrading purposes.

Figure 3-2: Demolished laboratory at NMIE with in the ESA compound at *Megenagna*

NQI institutions have a total of 547 staff members who are permanently employed. As observed in Table 3-1 hereunder, in NQI institutions the proportion of men and women in the consulted organizations is not equivalent; men outnumber women significantly. Discussion participants in these institutions indicated that women who have positions are minimal in number.

There is a trade union (workers' association) established in each of the NQI institutions. However, currently the association is not actively functioning. The union does not have collective agreement that ensures membership of workers in the trade union as a member. They are planning to adopt the collective agreement from the national workers association in Ethiopia.

Table 3-1: Staff Profile of NQI Institutions

No.	Name of Organization	Sex	Education Level			Total
			Masters	BA/BSc Degree	Diploma & below	
1	ECAE	Male	7	84	59	150
		Female	2	21	38	61
Subtotal			9	105	97	211
2	ENAO	Male	3	10	6	19
		Female	2	5	7	14
Subtotal			5	15	13	33
3	ESA	Male	13	45	30	88
		Female	1	17	35	53
Subtotal			14	62	65	141
4	NMIE	Male	6	57	39	102
		Female	2	15	42	59
Subtotal			8	72	81	161
Grand Total			36	255	256	547

NQI institutions are highly concerned with occupational health and safety measures because they are member of the ISO/ICE. Each of the institutions has ISO/ IEC standards concerned with occupational health and safety issues. For instance, ESA

abides by ISO/IEC 9001/2008, ENAO works in line with ISO/IEC 17025, and NMIE and ECAE adopted ISO/IEC 17065. NMIE and ECAE provide safety shoes, gowns, gloves, and other protective materials for their laboratory technicians. There are fire extinguishers at every corner of laboratory rooms (Figure 3-3). Besides, ECAE delivers milk for workers in the leather laboratory every day to reportedly detoxify the chemical they probably inhaled.

Figure 3-3: Fire extinguishers placed at corners in laboratory rooms

4. Administrative, Policy and Regulatory Framework

4.1 Environmental Protection Laws of Ethiopia

1. The Constitution of Ethiopia

The constitution of Ethiopia has important environmental considerations and pins down the rights of all citizens to live in a clean and healthy environment. In pursuance of this objective, Article 92 further declares that:

- The government shall endeavor to ensure that all Ethiopians live in a clean and healthy environment
- The design and implementation of programs and projects of development shall not damage or destroy the environment.
- Peoples have the right to full consultation and to the expression of views in the planning and implementation of environmental policies and projects that affect them directly.
- Government and citizens shall have a duty to protect the environment.

Ethiopia has also ratified multilateral environmental Conventions. To effectively implement and address environmental issues, Ethiopia has established the Ministry of Environment, Forest and Climate Change – in collaboration with other policymaking and regulatory bodies mandated to oversee some component of the environment.

2. Environmental Policy of Ethiopia

Ethiopia has formulated a national policy and Conservation Strategy on April 1997 for environmental management and protection and hence to implement the provisions of the Constitution on environmental matters. These policy and strategy documents address environmental issues in a holistic manner.

The overall environmental policy goal of Ethiopia is to improve and enhance the health and quality of life of all citizens and to promote sustainable social and economic development through the sound management and use of natural, human-made and cultural resources and the environment as a whole so as to meet the needs of the present generation without compromising the ability of future generations to meet their own needs.

The environmental policy has specific policy objectives including the improvement of the environment on human settlements, prevention of pollution of land, water and air, the improvement of the cultural and natural heritage of the country, the empowerment and participation of the society in environmental management, the need for environmental education and environmental impact assessment.

Overall, the environmental policy seeks to:

- Ensure that essential ecological processes and life support systems are sustained, biological diversity is preserved and renewable natural resources are used in such a way that their regenerative and productive capabilities are maintained and, where possible, enhanced so that the satisfaction of the needs of future generations is not

compromised; and, where this capability is already impaired, to seek through appropriate interventions a restoration of that capability;

- Ensure that the benefits from the exploitation of non-renewable resources are extended as far into the future as can be managed, and minimize the negative impacts of their exploitation on the use and management of other natural resources and the environment;
- Identify and develop natural resources that are currently under-utilized by finding new technologies and/or intensifying existing uses which are not widely applied;
- Incorporate the full economic, social and environmental costs and benefits of natural resource development into the planning, implementation and accounting processes by a comprehensive valuation of the environment and the services it provides, and by considering the social and environmental costs and benefits which cannot currently be measured in monetary terms;
- Improve the environment of human settlements to satisfy the physical, social, economic, cultural and other needs of their inhabitants on a sustainable basis;
- Prevent the pollution of land, air and water in the most cost-effective way so that the cost of effective preventive intervention would not exceed the benefits;
- Conserve, develop, sustainably manage and support Ethiopia's rich and diverse cultural heritage;
- Ensure the empowerment and participation of the people and their organizations at all levels in environmental management activities; and
- Raise public awareness and promote understanding of the essential linkages between the environment and development.

The policy is currently under review in order to encompass emerging issues (such as climate adaptation, greenhouse gas mitigation, management of e-wastes and wetland management). A brief summary of the draft policy is presented in the section below.

3. Revised Environment Policy of Ethiopia (draft)

The draft is currently in its eighth iteration subject to approval by the competent government body. Its goals, objectives and guiding principles are largely unchanged from the previous policy. It has nine sectoral policy and 18 cross sectoral goals. Climate Change issues are amplified as a major cross-sectoral goal in the revised policy. Accordingly, sections are included to reflect this issue and ensure that Disaster Risk management (DRM) and Climate Change Adaptation are included within respective sectoral policies to minimize and eliminate possible climatic and environmental hazards. The Policy, in this line also seeks:

- strengthen early warning and response systems to monitor the emerging climatic and related hazards in order to be able to trigger early and appropriate responses to reduce or mitigate disaster.
- enhance early warning and response systems for climate induced and non climate disaster risk reduction
- integrate climate change into development strategies
- ensure climate financing mechanism that will help the country take advantage of new and emerging climate change funds and also includes innovative ways to fund climate change actions.

- develop and implement awareness raising strategies and capacity development programs on the climate change adaptation and mitigation measures.

4. Environmental Protection Proclamations

Ethiopia has formulated and adopted a number of proclamations, standards, and guidelines to the effective implementation of the environmental policy. The regulatory framework under the federal government includes:

- Environmental Protection Organs Establishment Proclamation (Proclamation No. 295/2002),
- Environmental Impact Assessment Proclamation (Proclamation No. 299/2002),
- Environmental Pollution Control Proclamation (Proclamation No. 300/2002),
- Proclamation 94/1994 legislation on Forest Conservation ,
- Definition of Powers and Duties of the Executive Organs (Proclamation No.916/ 2015).

5. Environmental Protection Organs Establishment Proclamation, No. 295/2002

This Law established the federal Environmental Protection Authority (EPA) that preceded the current national environment management body – the Ministry of Environment, Forest and Climate Change. It also established Sectoral Environmental Units and Regional Environmental Protection Agencies. The EPA was established to formulate policies, strategies, laws and standards, which foster social and economic development in a manner that enhances the welfare of human beings and the safety of the environment, sustainable development projects and to spearhead in ensuring the effectiveness of the process of their implementation.

The former *Federal Environmental Protection Authority*, among others, has the powers and duties to:

- Coordinate measures to ensure that the environmental objectives provided under the Constitution and the basic principles set out in the environmental Policy of Ethiopia are realized;
- Prepare, review and update, or as necessary, cause the preparation of environmental policies strategies and laws in consultation with the competent agencies, other concerned organs and the public at large and upon approval, monitor and enforce their implementation;
- Liaise with competent agencies in the field of environmental protection and rehabilitation and support them in capacity development;
- Establish a system for environmental impact assessment of public and private projects, as well as social and economic development policies, strategies, laws, and programs; and
- Provide advice and support to regions regarding the management and protection of the environment.

6. Definition of Powers and Duties of the Executive Organs (Proclamation No.916/ 2015)

This law redefined the mandates of several government agencies including that of the environment. It amended all previous laws and provided for expanded responsibility to the Ministry of Environment and Forests. One significant development was the addition of "climate change" in the naming of the Ministry thereby amplifying its mandate regarding climate change mitigation and adaptation activities. Its current responsibilities include:

- environmental impact assessment or strategic environmental assessment on social and economic development polices, strategies, laws, programmes and project set by the government or Privet;
- prepare a mechanism that promotes social, economic and environmental justice and channel the major part of benefit derived thereof to the affected communities to reduce emissions of greenhouse gases that would otherwise have resulted from deforestation and forest degradation;
- coordinate actions on soliciting the resources required for building a climate resilient green economy in all sectors and at all Regional levels; as well as provide capacity building support and advisory services;
- establish a system for evaluating and decision making, in accordance with the Environmental Impact Assessment Proclamation, the impacts of implementation of investment programs and projects on environment prior to approvals of their implementation by the concerned sectoral licensing organ or the concerned regional organ;
- prepare programmes and directives for the synergistic implementation and follow up of environmental agreements ratified by Ethiopia pertaining to the natural resources base, desertification, forests, hazardous chemicals, industrial wastes and anthropogenic environmental hazards with the objective of avoiding overlaps, wastage of resources and gaps during their implementation in all sectors and at all governance levels;
- take part in the negotiations of international environmental and climate change agreements and, as appropriate, initiate a process of their ratification; play key role in coordinating the nationwide responses to the agreements;
- formulate or initiate and coordinate the formulation of policies, strategies, laws, guidelines and programs to implement international environmental agreements to which Ethiopia is a party; and upon appr oval, ensure their implementation;
- formulate environmental safety policies and laws on the production, importation, management and utilization of hazardous substances or wastes, as well as on the development of genetically modified organisms and the importation, handling and utilization of genetically modified organisms or alien species, and ensure their implementation.

The law also envisages the development of environmental cost-benefit analysis and formulates an accounting system to be integrated in development plans and investment programs.

Sectoral Environmental Units (SEUs): Every competent agency (sectoral) is required by Proclamation No. 295/2002 to establish or designate an environmental unit that shall be responsible for coordination and follow up so that the activities of the competent agency are in harmony with this Proclamation and with other environmental protection requirements. Accordingly, some sectoral agencies either have the structure or the mandated personnel (or both) to deal with environmental issues. Some of these agencies are currently re-structuring these units as Climate Resilient Green Economy Units or CRGE Units in order to mainstream actions of climate change according to their sector specific mandates. So far ministries responsible for transport, industry, agriculture, urban development and electricity have this nodal body responsible for climate change and environmental management.

Regional Environmental Protection Agencies (REPAs): Proclamation No. 295/2002 decrees that each national regional state should establish an independent regional environmental agency or designate an existing agency that shall ensure environmental objectives are met on the basis of the Ethiopian Environmental Policy and Conservation Strategy as well as other requirements. REPAs are also responsible for:

- Coordinating the formulation, implementation, review and revision of regional conservation strategies;,
- Environmental monitoring, protection and regulation;
- Ensuring the implementation of federal environmental standards or, as may be appropriate, and issue and implement their own no less stringent standards; and
- Preparing reports on the respective state of the environment and sustainable development of their respective states and submits the same to the Authority.

Recently, these agencies are restructuring their mandates and organizational structure to fit the federal body. Accordingly, most regional states are accommodating climate change and forest management in their mandates and reflecting these issues in their designation.

7. Environmental Impact Assessment Proclamation, No. 299/2002

The Environmental Impact Assessment Proclamation was issued in 2002 in order to make environmental and social impact assessment a mandatory procedure for projects to be undertaken by the government, public or private entities that require environmental and social impact analysis. The Proclamation elaborates considerations with respect to the assessment of positive and negative impacts and states that the impact of a project shall be assessed on the basis of the size, location, nature, cumulative effect with other concurrent impacts or phenomena, trans-regional context, duration, reversibility or irreversibility or other related effects of a project. Based on directives or guidelines pursuant to this proclamation, projects will be categorized as:

- Projects that are not likely to have negative impacts, and thus do not require environmental impact assessment; and
- Projects that are likely to have negative impacts and thus require environmental impact assessment.

As per the procedures in the proclamation, a proponent is required to undertake a timely environmental and social impact assessment - ESIA, assess the possible adverse

impacts of the proposed project, and propose the means of mitigation, and shall submit the study report to the relevant body (Federal or regional EPA) for review and decision. It is also a requirement that ESIA reports to be prepared by an expert that meets the requirements specified under directives issued by the Authority (regional/ federal).

Jurisdictions in the Proclamation: The regional environmental agency in each region shall be responsible for the evaluation and authorization of any environmental impact study report and the monitoring of its implementation if the project is not subject to licensing, execution and supervision by a federal agency and if it is unlikely to produce trans-regional impact. Those projects whose operational licensing, execution and supervision is to be carried out by a federal agency or those activities that may entail trans-regional impact has to secure their EIA approval from a federally mandated environmental body. As per the EIA law, this mandate belongs to the federal Environmental Protection Authority. The Authority has since 2013 transferred its mandates to the Ministry of Environment, Forest and Climate Change (MEFCC). The specific functions of EIA report appraisal is handed to the EIA and Licensing Directorate, which is mandated to oversee and monitor project activities for which EIA approval is sought or approval is already granted. At present, the Ministry has delegated sector ministries to handle all EIA related matters on its behalf. Thus, for agriculture related projects for instances, it is the Ministry of Agriculture and Natural Resources that will review EIA reports and grant/ deny approval. The delegated ministries report about their performance to the MEFCC periodically.

There is no requirement to review ESMFs as per the EIA Proclamation. During consultation with both MEFCC and Addis Ababa EPA, it was verified that projects that require review of EIAs have to be submitted to the federal Ministry or the regional environmental bodies depending on certain jurisdictional parameters. The review mandate will remain federal if the operations of the project proponent seeking an EIA review would entail a trans-regional impact; or the operation license is obtained from a federal government entity or if a regional environmental body sought technical support from the MEFCC. If the operation of the project is exclusively limited with in the local jurisdiction of Addis Ababa region without a trans-boundary impact, Addis Ababa EPA will have mandate over the review of the EIA report. It was accordingly concluded that the NQIDP will exclusively be implemented with in Addis Ababa City without any trans-boundary impact and hence any review of EIA documents will be done by the EPA of Addis Ababa city Administration. This said, however, consulted personnel of both the MEFCC and Addis Ababa City Administration confirmed that there is no requirement for the review of the ESMF. There is room for screening of project activities by the EPA of the Addis Ababa City Administration. But this could be handled as specific activities are identified and the view of the Authority is sought through the MoST or the Project Management Unit (PMU). Consulted EIA personnel at the EPA of Addis Ababa City Administration further remarked that during screening of project activities, the Authority may advice to conduct an EIA, environmental management plan (EMP) or simply issue environmental clearance letter without any condition for those project activities with no potential adverse impacts. Thus, it is possible to accept screening reports from the PMU and get a feedback from the Authority to chart out a course of action – on whether to have an EIA/EMP or not.

8. Environmental Pollution Control Proclamation, No. 300/2002

The aim of the proclamation is to control and manage possible causes of environmental pollution from hazardous substances, waste and any other forms of pollutants that pose serious environmental, social and health threats. The proclamation has important provisions on environmental standards, inspection procedures, offences and penalties, etc. In its provision to control pollution, the proclamation states that, among others:

- No person shall pollute or cause any other person to pollute the environment by violating the relevant environmental standards,
- The Authority or the relevant Regional environmental agency may take an administrative or legal measure against a person who, in violation of law, releases any pollutant to the environment.

9. Solid Waste Management Proclamation, No. 513/2007

This proclamation aims to prevent the adverse impacts and enhance benefits resulting from solid waste management practices. It provides the framework for the preparation of solid waste management action plans by urban local governments. The law recognizes existing solid waste management problems in the country and emphasizes the need to prevent environmental pollution that may result from the disposal of solid waste. While it empowers regional environmental agencies to draw out their plans as regards the implementation of the Proclamation and monitoring efficacy, it gives the mandate of coordination overseeing implementation to the Ministry of Forest, Environment and Climate Change.

Community participation is a core principle in the Proclamation. Urban local governments are empowered to prepare solid waste management action plans. Urban Administrations are duty bound to ensure the participation of the lowest administrative levels and their respective local communities in designing and implementing their respective solid waste management plans. Under Article 5.1 it is expected that each regional state or urban administration would set its own waste management schedule and, based on that, prepare its solid waste management plan and report the implementation of such plans.

10. Regulation 159/2008, Prevention of Industrial Pollution Regulation

This is one of the subsidiary legislations that aims at implementing Environmental Pollution Control Proclamation No. 300/2002 across industrial activities. Its objective is to ensure compatibility of industrial development with environmental concerns through ethical and proper management of resources.

The law confers obligations to industrial operators whereby their facility, should it fall under the ambit of jurisdiction of the regulation, prevent or minimize the generation and release of pollutants to a level not exceeding the set environmental standards of the country. The regulation also obliges industrial operators to handle its equipment, inputs and products in a manner that prevents damage to the environment and to human health. Moreover, the regulations urge industrial operators to prepare and implement an emergency response system of their own. On the other hand industrial operators are required to prepare and implement internal environmental monitoring systems and keep written records of the pollutants generated and the disposal mechanisms employed to

get rid of them. In relation to this, factories are required by the regulation to submit annual compliance reports with the provision of the regulations.

11. Environmental Directives, Guidelines and Standards

The Environmental Protection Authority (the predecessor to the MEFCC) has issued a number of guidelines and standards with the purpose of operationalizing the national environmental policy and laws. The National Environmental Council has endorsed these instruments. The purpose of these guidelines and directives is to ensure that development projects integrate environmental concerns at the onset while operational plans are developed.

Directive No.1 /2008 – A Directive issued to determine projects that require EIA: This was issued to determine projects and activities subject to environmental impact assessment. Lists of projects that require mandatory EIA are annexed to this directive. These projects include industrial and solid waste disposal facilities, and any project planned to be implemented in or near areas designated as protected.

12. Effluent Standards

The National environmental council has endorsed certain effluent standards for specified industrial sectors (12). These standards are posted on the official website of the Ministry of Environment, Forest and Climate Change but are not officially published. As a result, these are widely considered as draft effluent standards for Ethiopia. Other draft environmental guidelines prepared and posted on the website of the MEFCC that are widely used for several years now include the following:

13. Draft EIA Procedural Guidelines

This guideline, dated November 2003, outlines the requirements for screening, review and approval processes of development projects in Ethiopia and defines the criteria for undertaking an EIA. Projects are categorized into three schedules:

Schedule 1: Projects, which may have adverse and significant environmental impacts thus requiring a full scale Environmental Impact Assessment.

Schedule 2: Projects whose type, scale or other relevant characteristics have potential to cause some significant environmental impacts but are not likely to warrant a full EIA study.

Schedule 3: Projects which would have no impact and do not require an EIA.

However, projects will be determined on a case-by-case basis depending on the location of the project activity. Accordingly, if the activity is to be placed at an environmentally sensitive area such as land prone to erosion; desertification; areas of historic or archaeological interest; important landscape; religiously important area, etc. the project will most likely fall under Schedule I irrespective of the nature of the project.

Draft Guideline for Environmental and Social Management Plan: This was developed in May 2004 by the Environmental Protection Authority with the objective to outline the fundamental contents that need to be featured while preparing an Environmental and Social Management Plan (EMP) for a proposed development activity. It also

provides templates to be used for such purposes and possible institutional arrangements for the implementation of EMPs.

Draft EIA Guideline*:*

The EIA Guideline developed in May 2000 provides essential information covering the following elements:

- Environmental Assessment and Management in Ethiopia
- Environmental Impact Assessment Process
- Standards and Guidelines
- Issues for sector environmental impact assessment in Ethiopia covering agriculture, industry, transport, mining, dams and reservoirs, tanneries, textiles, hydropower generation, irrigation projects and resettlement

14. Technical Guideline on the Environmentally Sound Management of Biomedical and Healthcare Wastes:

This guideline was drafted in 2004 and provides information for the proper treatment of wastes from health-care establishments (public and private). The information provided takes due consideration of the waste management requirements of disposal and recovery measures as well as hygiene requirements. The safe management of biomedical and health-care wastes is essential for community and environmental health.

15. Radiation Protection Proclamation, No. 571/ 2008

The Proclamation requires for the establishment of an entity for the regulation of radiation sources and related practices in order to protect individuals, society and the environment against the harmful effects of radiation, while such sources and related practices are used for the benefit of the public. The Proclamation is applicable to radiation sources, accessories of radiation devices and related practices (Article 3(1)). The Proclamation established the Ethiopian Radiation Protection Authority (Article 4) as a regulatory body. The Authority is accountable to the Ministry of Science and Technology.

The Ethiopian Radiation Protection Authority (ERPA) is established to protect the society; property and the environment from hazards caused by radiation sources and related practices. As per Article 6, the Authority should promote researches that could support radiation protection activities. As the utilization of radiation for various purposes in increasing in Ethiopia (in the areas of medicine, for security involving X-rays, for testing materials, in home-use devices such as smoke detectors, and various industrial applications), setting up a regulatory body equipped with appropriate procedural guidelines is appropriate. Apart from this, the Authority is mandated to authorize import permit for radiation source that includes repatriating malfunctioning sources to the supplier after salvage value. The authority also conducts inspection at ports of entry to check compliance of the material according to legal requirements.

There is a notification and licensing procedure that ought to be followed by anyone who wishes to introduce additional sources of exposure or exposure pathways to people or

modifies the network of exposure pathways from existing sources. According to Article 16 of the Proclamation, any person who wishes to adopt, introduce, conduct, discontinue or cease any such practice shall follow a notification procedure and await authorization from the Authority unless the exposure to such practice is excluded or the practice is exempted from these requirements. In addition, no radioactive material could be mined, manufactured, constructed, assembled, acquired, transited, imported, exported, distributed, sold, loaned, hired, used, commissioned, maintained, repaired, disassembled, transported, stored or disposed of except in accordance with the requirement established by the Authority. The notification shall be made in writing and the person or agency requiring such shall pay appropriate licensing fees. Issued licenses may at any time be amended, suspended or even revoked if this is deemed necessary for the safety of society. The law also enlists the rights and duties of licensees and other regulatory bodies. Accordingly, the licensee assumes the prime responsible for the security of radiation source and the facility in which the source is used for different practices. The licensee is also responsible for ensuring that exposure for radiation resulting directly or indirectly from the authorized activity. Qualified personnel should be in place at entities using radiation to ensure that health and safety measures are in place and respected. In addition, there is an obligation to ensure workers safety for exposure of the radiation that will be monitored by the Authority.

The law also places limits for engaging in radiation works. Article 24 stipulates that a person wishing to engage in radiation work needs to have proper training and should be above 18 years of age. Such a person should also be healthy and free from any form of weakness.

16. Procedures and Regulatory Requirements for Fixed Facilities for Industrial/ Screening Radiography

The Ethiopian Radiation Protection Authority (ERPA) has issued Procedures and Regulatory Requirements for Fixed Facilities for Industrial/ Screening Radiography. This document specifies requirements for acquisition (importation) of sources or devices emitting ionizing radiation. Accordingly, the acquisition of these sources or devices as well as transfer to another party by any means shall be effected through the permission granted by the Authority. This will be effected by filling and submitting a protocol well before the acquisition of the source or device. The protocol demands detailed information about the type of application, the equipment in question, and when to implement it (or proposed stages of implementation), etc. If the requirements of the ERPA are satisfied, the Customs Authority will be informed for allowing the entry of the source into the country.

A full documentation is required with the application for authorization to the Authority. These include documents that indicate the source/machine specifications and design and shipping certificate, the agreements to transfer the source(s) to the supplier or to an authorized waste disposal facility at the end of the useful life and safety, operating and maintenance instructions; and ISO/IEC certification and layout of the department, basic associated equipment and accessories. The authorization process involves authorizing/licensing all practices involving ionizing radiation. The application has to be submitted to the Authority about the intended practice by completing the application protocol accompanied by a covering letter. The application will be reviewed for necessary documentations, safety provisions, layout of the department, basic associated

equipment and accessories, safety control systems, etc. In addition, the design of the facility and the adequacy of the Radiation Protection Program shall be approved by the Authority to ensure public and workers safety. After reviewing the application and request for fulfillment if any, compliance inspection will be conducted and replied accordingly.

The administrative requirements are in place and must be implemented in order to establish a written local safety rules and procedures and mechanisms for its implementation and follow up, form record keeping system, assign Radiation Safety Officer (RSO), ensure the security of the source(s) and facility at all times, etc.

The specific regulatory requirements an applicant should fulfill include:

- Sources and devices descriptions: Minimum description and design specifications of the source and device are required by the ERPA for devices such as sealed source radiographic devices, X-ray generators and accelerators.
- Verification of safety: This includes verifying the existence of shielded enclosure design for the types and intensity of radiation produced by the devices, safety controls system for radiographic/screening operations and storage of radiation sources, warning system, safety operations management, safety operations technical and safety assessment and quality assurance.
- Verification of worker protection: This involves conducting verification of worker protection in terms of classification of areas, local safety rules and supervision and monitoring.
- Verification of public protection: This involves ensuring the existence mechanism to control of visitors, sources of exposure, radioactive waste and discharges and monitor of public exposure.
- Emergency preparedness: A written emergency plan shall be established with the required inputs and the ERPA shall review for its adequacy and an authorization certificate must be available for inspection. In addition, workers involved in implementing the plan shall receive proper training.

Please see Annex 6 for further information.

4.2 Multilateral Environmental Agreements

There are quite a number of multilateral agreements in the environment sector to which Ethiopia has become a party. These agreements form part of the body of laws of the country as per Article 9 of the Ethiopian Constitution and are hence important to be considered when checking for the compliance of economic activities with laws in force in Ethiopia. Some of the main MEAs (such as UNFCCC, UNCCD, and UNCBD) are briefly stated below.

United Nations Framework Convention on Climate Change (UNFCCC): Ethiopia has ratified the Convention through Proclamation No. 97/1994 on May 2/1994. This Convention takes into account the fact that climate change has trans-boundary impacts. Its basic objective is to provide for agreed limits regarding the release of greenhouse gases into the atmosphere and to prevent the occurrence or minimizes the impact of climate change.

United Nations Convention to Combat Desertification: This Convention has been ratified by Ethiopia in 1997 through Proclamation No. 80/1997. The objective of the Convention is to combat desertification and mitigate the effects of droughts in countries experiencing serious drought and/or desertification, particularly in Africa.

United Nations Convention on Biological Diversity (UNCBD): Ethiopia has ratified this Convention by Proclamation No. 98/94, on May 31, 1994. The Convention has three goals: (i) the conservation of biodiversity; (ii) the sustainable use of the components of biodiversity; and (iii) the fair and equitable sharing of the benefits arising from the use of genetic resources.

Convention on International Trade in the Endangered Species of Fauna and Flora (CITES): Ethiopia ratified the convention in 1989. It provides an international umbrella for management and control of trade in endangered fauna and flora. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. It is initiated because of the crosses borders nature of the trade in wild animals and plants, which necessitates international cooperation to safeguard certain species from over-exploitation. CITES provides a framework to be respected by each Party, which has to adopt its own domestic legislation to ensure that CITES is implemented at the national level.

Stockholm Convention on Persistent Organic Pollutants: Ethiopia has ratified this Convention by Ethiopia by Proclamation No. 279/2002, on July 2, 2002. The Convention aims to ban the use of persistent organic pollutants (POPS). Originally, the POPs Convention contain 12 chemicals that were slated for total elimination or decreased use in industrial and agricultural processes. The list is expanding as parties to the convention ascertain the POPs character of other chemicals through the evolution of knowledge and experience.

Rotterdam Convention on Prior Informed Consent Procedures in International Trade of Hazardous Chemicals: Ethiopia ratified this Convention by Ethiopia by Proclamation No. 278/2002, on July 2, 2002. This Convention relates to prior informed consent in the context of international trade in specific hazardous industrial chemicals and pesticides. The Ministry of Trade in Ethiopia regulate (ban or severely restrict) the trade of such chemicals that have hazardous chemical formulation or serious use implications.

Basel and Bamako Conventions: Both of these Conventions have been acceded to by Ethiopia. The agreements regulate the trans-boundary movement of hazardous waste for the purpose of reclamation, or final disposal.

4.3 Labor Codes and Employment Issues in Ethiopia

Ethiopia has issued proclamations in the effort to improve employment relations and outcomes, protect child labour exploitation, and maintain proper occupational health and safety. The transitional government of Ethiopia has issued Labour Proclamation No. 42/1993. This proclamation was amended and replaced with Labour Proclamation No. 377/2003. The labour proclamations have had detailed provisions pertaining to workers suspension and protects their rights. Besides, there are other labour related proclamations such as the provisions of the Employment Exchange Service Proclamation (Proclamation No. 632/2009) and the Right to Employment of Persons

with Disability (Proclamation No. 568/2008) enacted to govern the relations between employers and employees.

The Labor Law protects Children against Child Labor abuse. Under the provisions of the Revised Family Code (2000), a child or minor is defined as "a person of either sex who has not attained the full age of eighteen years". Proclamation No. 377/2003, Article 89 prohibited employment of less than 14 years. The Proclamations states "It is prohibited to employ persons under 14 years of age". It is also prohibited to employ young workers, which on account of its nature or due to the condition in which it is carried out, endangers the life or health of the young workers performing it. "Young worker" means a person who has attained the age of 14 but is not over the age of 18 years (Article 89 Sub-Article 3).

The Labour Proclamation mandates employers to protect occupational safety, health and create better Working Environment for their workers. Article 92 states that "An employer shall take the necessary measure to safeguard adequately the health and safety of the workers…" The proclamations have details about the safety and health of workers. For instance, it forces employers to i) take appropriate steps to ensure that workers are properly instructed and notified concerning the hazards of their respective occupations and the precautions necessary to avoid accident and injury to health; ii) ensure that directives are given and also assign safety officer; establish an occupational, safety and health committee of which the committee's establishment, shall be determined by a directive issued by the Minister; iii) provide workers with protective equipment, clothing and other materials and instruct them of its use; etc.

In addition to enacting its labour codes, Ethiopia is also a signatory to the international UN conventions and has ratified the major international human rights instruments. Ethiopia has also ratified the following ILO conventions:

- Forced Labour Convention No.29 /1930;
- Freedom of Association and Protection of the Right to Organize Convention, No.87/1948;
- Employment Service Convention, No.88/1948;
- Right to Organize and Collective Bargaining Convention, No.98/1949;
- Abolition of Forced Labour Convention, No.105/1957;
- Minimum Age Convention No. 138 /1973;
- Occupational Safety and Health Convention, No.156/1981;
- Termination of Employment Convention, No.158/1982;
- The Rights of the Child Convention (1989); and
- The Worst Forms of Child Labour Convention No.182/1999.

4.4 Ethiopia's Regulations on Public Consultation

The Constitution recognizes the participation of local communities to give their pre-informed consent regarding development endeavors to be implemented in their milieu and share benefits from it as stated in its Article 43 (sub-article 2, 3 & 4). Article 43 proclaims the Right to Development, where peoples' right to:

- improved living standards and to sustainable development;
- participate in national development and, in particular, to be consulted with respect to policies and projects affecting their community; and

- the enhancement of their capacities for development and to meet their basic needs, are boldly recognized.

Thus, the Constitution creates a favorable atmosphere for assisting and empowering grass-root communities to protect their cultural heritages as well as no to be evicted from their land without their pre-informed consent and appropriate compensation. The Constitution under Article 40, sub-article 7 proclaims the rights of people to property and to get compensation for their assets they developed over the land. As per the article, all Ethiopian citizens have the right to develop immovable property on the land and get compensation in case the land is needed for public development purpose.

The Constitution up holds the right of users not to be forcefully evicted and displaced from their landholding. It protects citizen's rights to private property and set conditions for expropriation of property for public interest. Citizens have the right to immovable properties on land under their holding. The Constitution states that "every Ethiopian shall have the full right to the immovable property he/she builds on the land and to the improvements he brings about on the land by his/her labour or capital" (Article 40). The Constitution gives the right for the government to expropriate private rights over land: "without prejudice to the right to private property, the government may expropriate private property for public purpose" with prior payment of adequate compensation (Article 40 sub article 8). Article 44 (2) of the Constitution stipulates that all people who have been displaced or whose livelihoods have been adversely affected as a result of State programs shall have the right to receive adequate monetary or other alternative compensation, including transfer with assistance to another locality.

According to Proclamation No. 455/2005, the power to expropriate landholdings for a development project belongs to woredas (rural local administration) or urban administration. Article 3 of this proclamation states "a woreda or an urban administration shall, upon payment in advance of compensation in accordance with this Proclamation, have the power to expropriate rural or urban landholdings for public purpose where it believes that it should be used for a better development project to be carried out by public entities, private investors, cooperative societies or other organs …" The implementing agent is required to provide written notification, with details of timing and compensation, which cannot be less than 90 days from notification (Proclamation No. 455/2005 Article 4). Any entitled landholder who has been served with an expropriation order shall hand over the land to the local woreda or urban administration within 90 days from the date of payment of compensation should the leaseholder accept payment. Furthermore, where there is no crop or other properties on the expropriated land, the titleholder shall hand over the land within 30 days of receipt of expropriation order. Lastly, Article 4 (3) gives power to use police force if a landholder is unwilling to hand over land. The implementing agents are responsible for gathering data on the land needed and works to be done, and sending this information to the appropriate officials for permission. It is also required to compensate affected landholders (Proclamation No. 455/2005 Article 5).

4.5 World Bank Operation Policies (OPs)

The NQIDP is categorized under Category B of World Bank's classification. Since the scope and nature of the project activities (including design and scope of refurbishment; specific laboratory and testing equipment; etc.) and the specific sites for implementing them are not yet known or decided, the specific instrument proposed for analyzing potential environmental and social risks is ESMF. The ESMF is therefore required to

comply with not only the relevant national policy and legal frameworks, but also with the applicable environmental and social safeguard policies of the World Bank. The Project triggered only Environmental Assessment (OP/BP 4.01) of Bank's safeguard policy.

Environmental Assessment (OP/BP 4.01): This World Bank's Policy requires environmental assessment (EA) of projects proposed for financing by the Bank to ensure that they are environmentally sound and sustainable. The guidance helps to improve decision-making.

According to the World Bank, projects are classified into three categories (A, B, and C) based on the type, location, sensitivity and potential environmental impacts.

Category 'A' projects: The project is likely to have adverse environmental and social impacts that are diverse, sensitive and unprecedented affecting broader area than implementation sites. A full ESIA is always required for projects that are in this category, and for which impacts are expected to be ′adverse, sensitive, irreversible and diverse with attributes such as pollutant discharges large enough to cause degradation of air, water, or soil; large□scale physical disturbance of the site or surroundings; extraction, consumption or conversion of substantial amounts of forests and other natural resources; measurable modification of hydrological cycles; use of hazardous materials in more than incidental quantities; and significant involuntary displacement of people or other significant social disturbances.

Category 'B' Projects: The potential environmental impacts on humans and sensitive areas (wetlands, forests, natural habitats, etc.) are less adverse, site specific, few if any are irreversible. Even though an ESIA is not always required, some environmental analysis is necessary and some form of environmental management plan needs to be prepared with recommended measures to prevent, minimize, mitigate or compensate for adverse impacts. Typical projects include renewable energy; irrigation and drainage (small-scale), rural water supply and sanitation, watershed management or rehabilitation projects, rehabilitation, maintenance, or upgrading of projects (small-scale), rather than new construction.

Category 'C' Projects: There are no or minimal adverse environmental and social impacts. Such projects may not need ESIA other than screening. Typical projects include education, family planning, health, nutrition, institutional development, technical assistance, and most human resource projects. Such projects will not directly cause disturbance of the physical environment and biological components and do not need environmental assessment.

The NQIDP is assigned as EA Category "B" given that significant adverse environmental and social impacts are not expected to occur due to the nature of the proposed project activities (as the activities are largely limited to capacity development to the technical staff of the NQI facilities, refurbishment of existing facilities and procurement of specialized laboratory and testing equipment). Overall, the proposed operation will impact positively on the operations of NQI activities.

This process requires that NQIDP and its implementing partners screen project activities to identify their potential adverse impacts and thereby determine the corresponding mitigation measures and prepare an ESMP or ESIA to mitigate adverse environmental and social impacts.

5. Stakeholder Consultation on NQIDP Implementation: Summary

5.1 Stakeholder Consultation Approach

Stakeholder consultations were facilitated mainly by the consultants and an assigned focal person form the MoST. Prior to the date of consultation, the respective institutions were informed to fix the specific date of consultation and select the participants for the consultation. The following is a synthesis of consultation with stakeholders.

5.2 Consultation Period and Participant Institutions

A series of consultations were conducted between 28 September and 10 November 2016. Because of the site specificity of the project (located in Addis Ababa), stakeholders consultation was conducted with the pertinent staffs of NQIDP implementing institutions, project beneficiaries in MoST, the Ministry of Environment, Forest and Climate Change (MFECC), Environmental Protection Authority (EPA) of Addis Ababa City Administration, CSOs such as the ELA, and private sectors like K.O.J.J. Food Processing Complex Plc, Addis Modjo Edible Oil Complex Share Company, Tomoca Coffee Plc, EDE Garments and Textile Plc, Wosi Garments Sole Proprietorship, ELICO-Awash Leather Factory, Batu Tannery Plc, Wosi International Fashion Design, etc. Besides, consultation meetings, field visit was made by the team. The field visits entailed on-site observation of the laboratories that will potentially be upgraded through this project. These visits have triggered thorough discussions with the laboratory technicians and staffs on duty that have in turn helped to portray a clear picture and understanding of the project areas.

5.3 Views and Concerns of Stakeholders

NQI institutions have established a pool of assessors (external and internal) comprising different streams of disciplines to effectively and efficiently undertake their duties and responsibilities. The pool of assessors is recruited based on their expertise, experience, skill, and specialization. Hence, they are highly qualified professionals and expertise in the country elected through advertisement and competition based. There are two categories of assessors: i) technical assessors and i) lead assessors. The pool of assessors were given periodic training and to upgrade their knowledge and skill regarding the techniques of assessing, procedures, basic requirements, etc., that are mandatory to render testing services to customers. When trainings are completed, there is an experience of on-site evaluation to ensure that the participants have properly understood the training and evaluate their competence after the training program.

Consultative meeting participants in all institutions indicated that NQI development project will only have positive environmental and social impacts. This is because the project aims to build institutional capacity (human and technical) and promoting private sectors participation. There are no activities that involve greater construction that could cause pollution and community members' displacement due to land acquisition.

Besides, consulted participants indicated that the project targets IT infrastructure expansion that will enable NQI institutions to deliver e-learning programs and to file requests and claims online by customers. This enables to reduce the number of paper and printer inks used in the working environment. This has positive environmental and social impacts. These activities will reduce wastage related to the use of inks, papers, etc. Socially, it helps customers to get quality services without waste of time and

money, reduces complaints due to delay of services, and helps to easily reach and create awareness to wider community about the activities of NQI institutions.

One of the concerns raised by the participants was about the possible use of chemicals for a chemical metrology (not yet started) and lack of standardized system of waste disposal mechanisms. Discussants indicated that at this stage it is difficult to identify the types of chemicals to be purchased and used as part of the infrastructural development project. In fact, according to the standard operating procedure of the laboratories, they are expected to have appropriate mechanisms for safe handling and storage of chemicals and disposal of their waste. Standard Occupation Safety and Health (OSH) procedures are required. And NQI institutions also make sure that these exist. The laboratories need to comply with stringent compliance system.

Another important concern raised during consultation was about the health and occupational safety of workers working in dangerous areas such as construction, etc. To address this issue, NQI institutions work as per ISO 17020 that obliges to conduct Labor inspection. Hence, workers are given protective safety shoes, cloths, milk, etc. Besides, trainings about the standards is annually given to employees working on construction etc. sectors.

In all NQI institutions, there is complaint redress system. Participants indicated that they all have complaint handing procedure (which is also posted on their websites). They all have clear procedures on how to present or file complaints by customers. There are separate systems to address internal and external conflicts. For internal disagreements or conflicts, they follow civil servant compliant addressing procedures established by the Federal Civil Service and Good Governance Ministry. Detailed discussion of the internal and external conflict handling procedure is put in Annex 8 (Grievance Redress Mechanism).

Some institutions such as ECAE and ESA are planning to do some refurbishment work with the NQI development project. For instance ECAE will do refurbishment at the headquarters level as well as the six branches and three satellites in different parts of the country. Some IT equipment may be purchased and distributed to these sub-branches to ensure community to their services. Participants indicated that since the disposal of these purchased equipment is a national issue, incineration has been requested. ECAE has a good laboratory practice. Participants in this office stated that they didn't request the purchase of microbial and will not use gamma rays as these may have security implications and open up many questions.

The types of radiation mostly used by NQI laboratories are alpha, beta, gama and x-rays. These are next to visible rays when considered across the light spectrum. These are used only to test product specimens. The radiation laboratory facility is itself built by the Ethiopian Radiation Protection Authority (ERPA) as per the standards of the International Atomic Energy Agency (IAEA). Testing operations are strictly monitored. While administering the tests, it was stated that all forms of protective devices are used. ECAE Participants indicated that the Enterprise has secured competency certificate from ERPA for such operations. For accreditation services (to test whether a product is radiation free) ECAE uses laboratory equipment accessed from the Radiation Protection Authority itself. Appropriate protective devices are used during laboratory tests to ensure that harmful rays don't get into personnel handling the

operation. For larger projects (industrial applications), experts from the ERPA come to oversee the operation.

All laboratory wastes are handled using guidance from ISO 17025 and adherence to good laboratory practices. For accumulated wastes, NQIs intend to use the incineration facilities of cement factories in the country. It was indicated during the consultation that cement factories would use these wastes as fuel inputs. Participants also explained that the NQIs have begun discussions with the cement factories through the ELA.

Only three of the laboratory facilities will benefit out of the NQIDP through purchase of equipment. These are agro-processing textile and leather laboratories. Agro-processing in turn uses chemical, microbiology and radiation laboratories. The personnel operating these laboratories use what is known as Good Laboratory Practices /GLP/ and operate as per ISO 17025 standards. Adherence to the GLP requires NQI operators to use dosimeter badges to measure alert the maximum amount that the person can be exposed to. ECAE records this on a daily basis and, periodically, sends monitoring reports to the ERPA. For this purpose, ECAE uses its monitoring equipment that it has to determine hazard levels – not only from its own radiation facilities – but also to render services to customers nationwide that seek the determination of radiation hazard levels within their operation facilities. The equipment that will be purchased for radiation purposes will have to comply with the radiation levels allowed by the regulatory agency – ERPA. Participants indicated that the limit cannot be surpassed. ERPA will also check procurement sources as well as plans for final disposal of waste radiation equipment. The new radiation equipment requested for purchase under the NQIDP has to be traceable and is even expected to enhance safety to the existing equipment.

Chemicals that will be used as inputs into chemical laboratories have to be sourced from known and credible sellers. These chemicals are required to be traceable, with all accompanying documents including user manuals, safety procedures and guidance for storage, use and final disposal. ECAE participants indicated that there is no risk related to the operations of the microbiology laboratory. Currently, the lab is giving services using ordinary procedures on limited parameters. Most of the customers for this lab are food industries. There is no risk related to handling of biological wastes, as the test procedure is culminated with autoclaving the biological materials. Again, each procedure is standardized and ECAE has to comply with GLPs and ISO 17025 standards. To stand in business, participants reiterated that this part of the procedure cannot be bypassed by ECAE.

Tests conducted at textile and leather laboratories are largely of physical nature with minimal use of ordinary chemicals. Chemical waste from these facilities is managed according to appropriate waste management procedures. The requested purchase for textile lab equipment is also expected to give services to environmental safety testing of other factories. This will even enhance the performance of other textile factories in terms of environment friendly performance.

Participants from ERPA indicated that the importer of any radioactive material or equipment containing such material has to be licensed by the Authority. Besides, any national importing body needs to have proper operational license before it intends to import equipment that contains radioactive elements. These licenses have to be renewed

periodically. ERPA has signed a memorandum of understanding with Ethiopian Customs Authority to check compliance with this import procedure. Accordingly, the import of any of such materials without appropriate operational licenses will be blocked at any port of entry. There is a national standard that has set the threshold for the annual dosage of radioactive material that radiation workers may be exposed to.

During stakeholder consultation, NQI institutions explained that they have taken actions to mainstream gender and ensure gender equity with in their respective agencies. All the stakeholders indicated that the existence of women empowerment activities that were undertaken by respective units and gender experts. The institutions have been working to address gender as per the regulation of the GoE. Women are given special consideration and priority in training opportunities offered to their agencies. Women were given priorities at instances where job recruitment processes tend to give women equal points with the men. Some institutions attempted to design strategies aimed at delivering services to women owned organizations with a discounted cost payment system. For instance, consulted participants from ECAE have indicated that 15% service payment discount was given to women. This means women pay only 85% of the cost of service and the rest 15% was covered by the organization.

Besides these benefits and the efforts to ensure gender equity, priority was given to women in the training packages and, as much as possible, efforts were exerted to balance the proportion of men and women training participants. There are also special training packages arranged by gender units and experts in each sector offices of NQI institutions. During employment of lab technicians, since NQI institutions believe that women are more considerate, careful, and responsible in management and handling of equipment and lab setting, priority is also given for women while employment. They encourage women to be active participants in decision-making and hold positions in each department. To protect the right of workers, a women focused trade union is already established. However the collective agreement is not yet signed.

There are certain measures of waste management practices by NQI institutions. There are open roofed stores built to dump wastes temporarily. For instance, ECAE has put in place the practice of segregating waste item by item, which the team has observed during site visit. NMIE is planning and have the need to commence chemical metrology service within the coming two to three years. Hence, they will use chemical inputs, but in small amounts. During consultation, participants stated that the chemicals that will be put in use has to be certified and traceable. Hence, their impact and disposal strategy are already well known, as this is a requirement under certificates issued for such chemicals. Consulted ELA members indicated that the association is planning to establish one central incinerator facility for chemical residues/wastes (including organic solvents) in Ethiopia. Though the establishment of the facility is not part of the NQIDP, consulted members of the ELA indicated that the association has finalized preparatory works and discussed with the responsible government organizations such as Ministry of Health regarding safety and health issues. ELA is currently planning to conduct baseline study.

Consulted participants also pointed out that since they are working in line with ISO/IEC standards, their activities including NQI development project activities will not endanger the environment and pose negative social impact. Rather, the project will have immense positive environmental and social contributions. That is ESA adopts and

works with ISO 9001/2008, ECAE and NMIE as per ISO/IEC 17025, and ENAO works in line with ISO/IEC 17011. Besides, there are a number of international quality infrastructure institutions which these institutions are a member such as DAKKS, ILAC, etc., that control and inspect their activities every year. There is also an internal audit system pursued by NQI institutions by an established team of experts within the organization.

All participants of NQI institutions indicated that the society has little awareness of their function. Hence, they all agreed that awareness raising should be highly emphasized using electronic media to disseminate information about the national quality infrastructure. They strongly want to influence consumers/ society so that they will question and demand quality of goods and services they consume.

Consulted private sectors participants have been involved in delivering their products to the international markets such as China, India, Europe and the United States of America. They indicated existence of capacity gaps in the NQI institutions as well as limited nature of services available. The main challenge being faced by the private sector in their engagement with Ethiopia's NQI institutions is failure to get quality services as per the demands of the international market. The private sectors are not able to access some quality standard tests in Ethiopia's NQI institutions to meet international standards and export their products. These include such quality measures as restricted substance test, edible products stability test (shelf time/ expiry date determination test), final product surface area measurement, etc. Consulted private sectors indicated that Ethiopia's NQI institutions are not mature and are unable to move fast with the international NQI institutions such as RICH in Europe and Canada to allow them deliver quality products to the international markets in Europe. Participants also pointed out that the European product quality standards are frequently updated each year and they are unable to meet the standards since the NQI institutions in Ethiopia are premature and lack the capacity for upgrading their standards in-time. Their laboratories are also not competent and aligned with their international counterparts.

Private sector participants also reflected felt weakness among the national standard technical committee (STC) established at the national level. They indicated that some STC members lack the necessary capacity and the skill-sets to set standards for products. According to participants, some institutions simply assign staffs as a member to the STC without proper assurance of the required expertise, and knowledge about the quality of products. They indicated that these practices need to be revisited and the right professionals with the required expertise should be assigned as members to the national STC.

Users of the Ethiopia standard logo indicated that the amount they pay per month for the institution is exceedingly high. This may discourage medium and small private firms that may request for accreditation services. Besides, they indicated the lack of skilled manpower to calibrate flour factory machineries. Hence, they brought professionals from abroad mainly from Germany that entailed payment of international fees for their services.

Consulted participants from the MEFCC and the Environmental Protection Authority of Addis Ababa City Administration indicated that there is no requirement to review ESMFs as per the pertinent environmental impact assessment (EIA) laws or procedural

guidelines. During consultations, it was verified that those projects that require review of full scale EIAs have to be submitted to the federal Ministry or the regional environmental bodies depending on certain jurisdictional parameters. The review mandate will remain federal if the operations of the project proponent seeking an EIA review would entail a trans-regional impact; or the operation license is obtained from a federal government entity or if a regional environmental body sought technical support from the MEFCC for the review of the EIA. If the operation of the project is exclusively limited with in the local jurisdiction of a certain region, it is the regional environmental authority that will review the EIA report. When assessed against these stated parameters:

- The NQIDP is implemented only in Addis Ababa, and it will not have trans-regional environmental impact.
- The operations of the NQIs does not require federal licensing; and
- There is no specific request from any regional state on the review of EIA documents for the implementation of the NQIDP.

Thus, the implementation of the NQIDP does not fall under a federal mandate. Besides, all project activities are localized and site specific. All project activities are confined to the premises of the NQI institutions in Addis Ababa. Thus any review of EIA documents will be done by the EPA of Addis Ababa city Administration. This said, however, consulted personnel of both the MEFCC and Addis Ababa City Administration confirmed that there is no requirement for the review of the ESMF. There is room for screening of project activities by the EPA of the Addis Ababa City Administration. But this could be handled as specific activities are identified and the view of the Authority is sought through the MoST or the PMU. Consulted EIA personnel at the EPA of Addis Ababa City Administration further remarked that during screening of project activities, the Authority may advice to conduct an EIA, environmental management plan (EMP) or simply issue environmental clearance letter without any condition for those project activities with no potential adverse impacts. Thus, it is possible to accept screening reports from the PMU and get a feedback from the Authority to chart out a course of action – on whether to have an EIA/EMP or not.

5.4 Views of Stakeholders about the Contribution of the Project

Participants indicated that their needs and challenges are many. NQI development project can address some aspect of their problems such as access to modern lab technologies, better office and laboratory settings, etc, and the project will contribute a lot in meeting their mission. They indicated that the project will assist them in their ambition to be renowned institutions in Africa regarding accreditation, conformity assessment, and metrology. In addition, the project has significant contribution in raising the country's export goods which in turn increase the national income for export tax. It enables to create competitive private firms in the national and international market.

Besides, consultative meeting participants revealed that NQI development project will have contribution at institution levels in particular and at national level in general. Participants during the discussion pointed out that this NQIDP:

- increases number of customers, who will seek accreditation services;
- allows each NQI institutions to IT services such as software;

- helps to give fast services to customer reduces customers' waiting hours;
- builds institutions good images both nationally and internationally;
- promotes paperless work that have a contribution to clean environment;
- increases the awareness of the society on use and demand for standard goods which in turn creates high demand by private firms for accreditation;
- improves society health and safety due to increased use of standard goods and services as a result of awareness raising;
- creates confidence among institutions and personnel regarding their service provision;
- creates well capacitated, mutually organized, and functioning NQI institutions;
- curbs technical barriers of NQI in Ethiopia;
- increases export and import of products both in volume and quality;
- improves environmental quality and better trade regulation;
- leads to increase in competitiveness of Ethiopian products globally due to increases acceptance of goods and services produced in Ethiopian;
- facilitates fair trade, competitive prices, safe products for consumers, etc.;
- encourages transparent governance.

5.5 Main Challenges Identified During Consultation

Consultative meeting participants have expressed their institutions main challenge that needs to be addressed if possible. ENAO has indicated that they do not have office and laboratory building. This has caused a serious problem to keep customers files and documents in a more organized and confidential manner, inconvenience to provide proper services, high staff turnover, etc. The problem is further aggravated by the location of the current building rented just adjacent to the railway where there is no accessible bypass or crossing to get ENAO. Hence, workers and customers travel a long distance that causes fatigue and loss of time. ENAO and NMIE indicated that the internal office infrastructures such as toiletries, cafeterias, etc are not too conducive to women. Women staffs are not free and comfortable like men regarding the seats arrangements, café settings, etc.

5.6 Stakeholders Consultation and Disclosure Policy

The World Bank requires undertaking stakeholder consultation and disclosure of the ESMF. Stakeholder consultative meetings were carried out with NQIDP beneficiary offices and agencies under MoST such as ECAE, ENAO, NMIE, and ESA. Besides, meetings were arranged between the study team and a number of private sectors and CSOs such as the ELA. The consultative meetings were done with the aim of exploring the likely social and environmental impacts of NQIDP and forward possible mitigation measures as well as create awareness about the objective, components and subcomponents of the project. List of consulted stakeholders is attached to this report (see Annex 10). The ESMF will be disclosed at World Bank's Infoshop and the website of MoST.

6. Potential Environmental and Social Impacts of NQIDP

The proposed NQIDP can have positive and negative impacts and the impacts may occur mainly during the construction phase, (*i.e.*, upgrading of existing facilities and operation) and implementation phase (specifically in relation with NQI laboratory activities and waste management). The environmental and social management plans that will be prepared at later stages are intended to maximize the positive impacts and ensure sustainability of subprojects by avoiding, minimizing, mitigating or compensating the negative impacts through appropriate mitigation measures. As can be noted from Table 6-2 on Impact Matrix, most of the project impacts are positive. The negative impacts are largely reversible with lower levels of effects because of the factors related to intensity, duration, spatial extent, and probability. The significance of impacts is calculated based on a UNEP impact evaluation criteria depicted in Figure 6-1.

Impact rating		Description	Significance
Intensity	severe	severe alteration of natural properties, functions, processes	high
	notable	notable alteration of natural properties, functions, processes	medium
	negligible	negligible alteration of natural properties, functions, processes	low
Duration	long-term	continuously or regularly (once per day) over project life, permanent or irreversible effects (including aftermath effects)	high
	medium-term	several years (< 5) of duration, (including aftermath effects) reversible, periodic events (several times per year)	medium
	short-term	less than one year or restricted to construction, reversible	low
Spatial extend	far-range	effects beyond project site and nearby areas beyond 1,000 m distance of origin	high
	mid-range	within the project site and nearby areas within 1,000 m distance of origin	medium
	localized	punctual, within the area of the project site within 100 m distance of origin	low
Probability	definite/likely	highly probable (> 80%) or definite	high
	possible	fair chance of occurring	medium
	unlikely	little or no chance of occurring (< 20%)	low

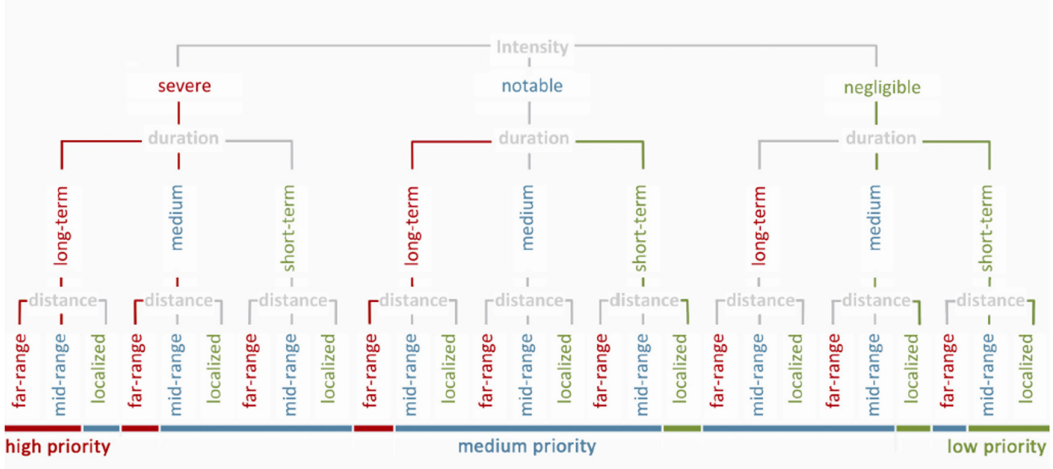

Figure 6-1: Significance ratings for impact evaluation criteria (Source: UNEP 2008)

Interpretations of impact rating of the NQIDP interventions

1. *Extent / spatial scale of the impact*

It indicates the area over which the impact will be experienced. A description should be provided as to whether impacts are either limited in extent or affect a wide area. For example, impacts can either be site specific, within the project boundary or beyond.

Examples of criteria for rating the extent / spatial scale of impacts.		
Rating	Definition	Score
High	Beyond subproject site	3
Medium	Within subproject site	2
Low	Site specific/within the area of the project site	1

2. *Intensity / severity of the impact*

This is related to the magnitude of impact in relation to the sensitivity of the receiving environment; taking into account the degree to which the impact may cause irreplaceable loss of resources. It is expressed in terms of relative severity of the impact in terms of its potential for causing either negative or positive effects. Intensity also takes account of other aspects of impact whether or not an impact is reversible and the likely rate of recovery.

Examples of criteria for rating the nature /intensity / severity of impacts.		
Rating	Definition	Score
High	Severe alterations of natural functions, properties and processes.	3
Medium	Where the affected environment is altered but the functions and processes are continue al be it in a modified way/notable alteration of natural functions, properties, processes	2
Low	Negligible alteration of natural properties, functions and processes:	1

3. *Duration of the impact*

It should be determined whether the duration of the impact will be short term (< 1 year), medium term (1 to 5 years), or long term (more than 5 years with the impact ceasing after the operational life of the development), or considered permanent).

Examples of criteria for rating the duration of impacts.		
Rating	Definition	Score
Long–term	Where the impact will cease after the operational life of the activity, either because of natural processes or human interventions. More than 5 years, but possible to cease afterwards.	3
Medium–term	Reversible over time, lifespan of the project (0 to 5 years)	2
Short–term	Quickly reversible, less than the project lifespan and/or less than one year.	1

The combined score of these three criteria corresponds to a consequence rating, as follows: it is the sum of scores of the three impact characteristics (intensity (I), extent (E), and Duration (D)"

Consequence of Impact = I + E + D

The combined consequence of impacts is calculated as a sum of the intensity (I), duration (D), and spatial extent (E) of the impacts. The method used to calculate the overall consequence of impacts is shown hereunder.

Combined Score (I + D + E)	3 – 4	5 - 7	8 - 9
Consequence rating	Low	Medium	High

Once the consequence is derived, the probability of the impact occurring will be considered, using the probability classifications. The probability or degree of certainty of the impact is then rated low and high depending the degree of likeliness of the impact happening regardless of prevention measures.

The overall significance of impacts is determined as a function of the consequence and probability of the impact using the rating system described in Table 6-1:

Impact significance = Consequence of impact X Probability of impact

Table 6-1: Impact significance calculation

Consequence of Impacts		**Probability of Impacts**		
		Unlikely	**Possible**	**Definite**
	Low	Low	Low	Medium
	Medium	Low	Medium	High
	High	Medium	High	High
		----------Impact Significance ----------		

Based on the above calculation, the negative impacts from the NQIDP are prioritized as follows.

Table 6-2: Potential positive and negative impacts and scoring

Potential Impact	Type	Intensity	Duration	Spatial Extent	Overall Consequence	Probability	Priority
Contribution to macro economy	+++						
New types of business opportunity	++						
Enhancing competitiveness in the market	++						
Provision of quality goods and services	+++						
Improved social accountability to firms	++						
Enhanced beauty, sanitation and medical services for women	+++						
Air pollution	- -	L	L	L	L	H	M
Soil Pollution	-	L	H	L	M	L	L
Impacts on occupational safety	- -	H	H	L	M	M	M
Fire hazards	-	H	H	L	M	L	L
Impact of road vibration on NQI operations	- -	H	H	L	M	M	M
Keys: Positive impact: +++ High impact, ++ Medium impact, + Low impact Negative impact: - - - High impact, - - Medium impact, - Low impact L=low; M=medium; H=high							

Source: Consultants' analysis

6.1 Potential positive impacts

The NQIDP has positive project benefits in terms of its contribution to the macro economy, creation of new business opportunities, enhancing competitiveness in the market, provision of quality goods and services, enhancing social accountability to firms, as well as enhanced beauty, sanitation and medical services for women.

Contribution to the Macro-Economy

This is an indirect positive impact of the project. The NQIDP will address priority quality objectives of Ethiopian and foreign products by helping them comply with acceptable international environment and labour standards. While it catalyzes the market to act against dumping of sub-standard products and near end of life equipment that may soon be turned into wastes, it also facilitates international trade whereby it enhances the reliability of Ethiopian products by trading partners. The country can export branded goods that will be internationally acceptable. In the global business, it is clear that consumers in the developed countries prefer standard products accredited by renowned institutions in the area. The project has greater contribution in making NQI institutions capable both materially and qualified human power which will contribute to the acceptance and credibility of these institutions internationally. As a result, producers in the country will get customers in the global market and sale their products with fair price. Hence, this potentially enhances the profitability of private firms as well as tax revenue of the nation from export markets.

Novel forms of business opportunities and enhanced competitiveness

The project will lay the foundation for the creation of competitive firms who can supply goods and services to the domestic and international market. Consequently, the project will have the compounding effect of making the country and the country's products access better income from the export of manufactured goods. As the market for such products endure and gets regulated, the production of better quality products will drive the traditional types out of business. New opportunities will thus arise that create green jobs and quality products.

Social Accountability of Firms

The project aims to equip NQI institutions with appropriate facilities and instruments, building human power, upgrading laboratories and office, and raising the awareness of the broader society towards the importance and role of certifying products that meet consumer satisfaction as well as the right to get commensurate products. Conversely, the project creates demand on firms to abide to standards and have more social accountability. Domestically, the project helps to raise the awareness level of society towards standard goods as well as the core objectives of conformity assessment, metrology, and accreditation, which in turn makes the wider community to prefer and demanded accredited products. As a result, there could be a high need and demand of NQI services such as for conformity assessment and metrology by firms to get accreditation for their products. Getting accredited means getting their products to be preferred by customers, enjoying a good customer base in the future and enhancing profitability that would guarantee their sustainability as a business. This would have the leverage effect of making businesses to care for the community who are their customers and thereby develop social accountability. As profits continue to rise, firms will get it expensive to fall back to the quality thresholds they have set for themselves. They would in fact allocate a portion of their profit to sustain their quality. As a result, communities will consume standard goods and their health will be maintained and health risks associated with low product quality will be avoided or otherwise minimized.

Enhanced services for women

The project will have enormous contribution for women. Consumption of sub-standard goods particularly cosmetics and medicine has serious health impacts. Commonly, in everyday life women regularly use cosmetics, jewelries and medicines at times of pregnancy or birth - more frequently than men. As discussed above, the function of the project is strengthening NQI institutions capacity to regulate business and firms deliver standard goods and accredited services. Besides, the project aims to raise the awareness level of the broader society to use standard goods and services. Hence, delivery of standard goods and services by firms will benefit women; and consumption of standard goods has greater contribution for women's health.

6.2 Negative Impacts

The activities within the NQIDP project will not entail land acquisition or restriction of access to the community. Physical works are pretty much confined to the existing site of the NQI facilities alongside the ring road near *Megenagna*, Addis Ababa. No severe negative environmental impacts are anticipated emanating as a result of the project

activities and sub-components (i.e. refurbishment of existing NQI facilities, capacity building, technical equipment purchase and use as well as some chemical purchase for inputs into some of the equipment). Thus, major environmental damages (such as loss of vegetation, soil erosion, soil contamination and water pollution etc.) owing largely to project siting are not anticipated. This said, however, the implementation of the infrastructure investment under the first component of the project may result in unintended environmental and social consequences, albeit insignificant in magnitude. The following is a summary of anticipated negative impacts.

Air and soil and ground water pollution

This relate to the anticipated refurbishment and renovation of the existing physical infrastructure and facilities as well as wastes as a result of the project activity. As the list of equipment and chemical inputs for the laboratories are not fully finalized, it is possible to indicate only a few of the impacts and likely measures that ought to be considered. These impacts may include demolition wastes, air pollution due to particulate matter (dust) from the construction, soil and water pollution, and waste generation from chemicals, electrical, electronic, and metallic equipment that result as by-products during future operations of the facilities. These wastes pose a potential threat to human health and the environment when improperly disposed. Improper disposal of such wastes in practice may cause health and pollution hazards.

Occupational Safety and health impacts and fire hazards

Potential dangers likely to originate from technological or laboratory accidents (sudden fires), dangerous procedures, infrastructure failures or certain human activities, which may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation, should also be considered while implementing project activities. As future activities are not expected to make use of chemicals at industrial scales, wastewater or hazardous waste management may not be issues. However, as indicated under subsection 1, misuse and abuse of chemicals, disposal of wastes as well as chemicals may pose potential concerns and have to be included in management plans.

Impact of road vibration on NQI operations

Most of the NQI facilities are situated at the side of the ring road at the place commonly called *Megenagna*. It was noted, during the consultation, that some measurement and calibration equipment are sensitive to slight reverberations. The project has sought a mechanism whereby the structures subject to renovation and refurbishment will reinforce the walls and floors to withstand this impact.

Negative social impacts

There are no identified potential negative social impacts of NQI development project at community level related to displacement and loss of assets because of the fact that project activities don't require community members' land. Hence, involuntary resettlement and loss of assets due to land acquisition will never occur and could not be an issue in NQI subproject implementation. Generally, the project targets i) strengthening NQI institutions capacity, and ii) enhancing private sector engagement in demanding and providing quality assurance services.

Thus, the NQI development project hasn't triggered any of Bank's social safeguard policies. The project basically aims to upgrading the existing infrastructures and build capacity of NQI institutions in Ethiopia. There will not be land acquisition and loss of community members' assets. Hence, OP/BP 4.12 on Involuntary Resettlement isn't triggered. Field visit and discussion with stakeholders during consultative meetings also confirmed that upgrading work do not demand further land and do not cause both economic and physical dislocation of community members. There are laboratories and office structures, which will be upgraded at their initial location. As a result, land acquisition is not a concern during project implementation. Checklists or guidelines for safeguards screening and negative project impact identification were developed and included in this ESMF (See Annex 1).

However, potential social risk of the project is related to conflict or disagreements that could emanate from competition among workers for capacity development training. One of the core pillar activities of the project is capacity building component. It plans to develop human and technical capacity of NQI institutions with the aim of providing support for ESA to act as the national standards enquiry point, improve the NMIE's calibration services to support businesses, strengthen the capacity of ENAO to provide accreditation services, strengthen the ECAE for providing inspection, testing, and certification services. Unless the right procedure is set and followed and proper gender-responsive criteria, conflict or disagreements would arise as a result of the need for capacity building training of NQI development project.

Another social risk that may affect the successful implementation of project is staff turnover in NQI institutions. In all government organization, staff turnover is common and in some it is much higher due to low salary and lack of good governance and managerial related problems. Hence, staff retentions are crucial for the successful completion of the project. Better salaries should be considered for PMU staff members. Besides, at least two staff members of NQI project implementing agencies should participate in the orientation and capacity building training intended for project implementation. Hence, in case when one staff leaves the office, the other will be easily take-over and involved to effectively implement the project.

6.3 Enhancement/Mitigation Measures for Identified Impacts

The impacts of the NQIDP, which are categorized into social, occupational, and environmental, are presented with enhancement or mitigation measures during the construction and implementation phases (Tables 6-3 and 6-4).

Table 6-3: Construction (Refurbishing) Phase Impacts

Identified Impacts	Enhancement/Mitigation Measures	Responsible Body	Estimated cost (ETB)
Air pollution	Provide safety devices for construction workers Wetting walls during times of demolition	CPC	Part of construction cost

Table 6-4: Implementation Phase Impacts

Identified Impacts	Enhancement/Mitigation Measures	Responsible Body	Estimated cost (ETB)
Socio-economic issues			
Contribution to macro economy	Enforcement of rules and regulations Building in incentive schemes for compliant businesses through, for instance, popularization schemes using online and media outlets as well as organizing annual events with the Ethiopian Chamber of Commerce and consumer association/s	MoT FMHACA	ETB 20,250,000.00 Weekly (30 min) radio program for five years year @ ETB 10,000 per week (both for production and airtime): Total=2,600,000 Weekly (30 min) TV program for five years @ 50,000 per week (both for production and airtime): Total=13,000,000 Website platform and monthly e-newsletters (using current staff); website hosting and maintenance for five years @ 30,000 per year; office stationery @ 100,000 per year): Total=ETB 650,000 Annual forum (1000 persons x ETB 500 per

Identified Impacts	Enhancement/Mitigation Measures	Responsible Body	Estimated cost (ETB)
			person): 500,000 for five years: total 2,500,000 Promotional materials @ 300,000 per year lumpsum for five years: total 1,500,000
New types of business opportunity	Popularizing these new businesses through online and other media outlets	PMU @MoST	Same as above
Enhancing competitiveness in the market	Encourage the involvement of large number of private and public firms in accreditation activities Raise awareness of private businesses about the benefit of being accredited, conformity assessment, and getting metrology services		Same as above
Provision of quality goods and services	Raise community awareness towards the benefit of consuming goods with good quality so that		Same as above
Improved social accountability to firms	Enforcement of rules and regulations Building community awareness on quality issues		Same as above
Enhanced beauty, sanitation and medical services for women	Encourage women not to consume low standard goods particularly cosmetics and medicines has serious health impact.		Same as above
Low participation and under-representation of female staffs during the project implementation	Allow women to be employed in the PMU and involve them as technical committee members Awareness raising program for management bodies of the implementing agencies regarding gender mainstreaming and women empowerment Special training packages need to be designed for women on gender mainstreaming and awareness raising Women need to be active participants during project design and monitoring and evaluation to address their needs (work as per the gender action plan prepared)		Same as above
Occupational safety and health issues			
Impacts on occupational safety and health	Strengthening CPC as the social and environmental management and monitoring unit The PMU should implement good laboratory practice in all labs to ensure	CPC	ETB 4,925,000.00 (ETB 985,000.00 per year for five years)

Identified Impacts	Enhancement/Mitigation Measures	Responsible Body	Estimated cost (ETB)
	proper handling, storage, use, and disposal of chemicals based on local and international standards and regulations. Training staff in relevant aspects of proper handling, use, storage, and disposal of chemicals. Promoting the use of PPEs in laboratories and enforcing rules regarding proper use of PPEs for vulnerable staff		CPC: personnel (one social and one environmental expert @ 20,000 per month): Total=240,000; office furniture, equipment and stationery@ 500,000 lump sum: total: 740,000 per year Training of trainers on dangerous goods management for 20 employees from the PMU (fee for trainers @ETB 10000 per day for one week per year: 70,000; trainees' costs @250/day for seven days for 20 participants plus transportation and venue costs (additional 2000 per person): 75,000: total ETB 145,000 for one year Promotion of PPEs @ 100,000 (lump sum) per year
Environmental issues			
Soil and ground water pollution	Adopt good solid and chemical waste management procedures including segregation at source, minimize waste, promote re-using and recycling, and good laboratory practice. Provide training to the right staff on solid, liquid and chemical waste management Put in place high-temperature incinerator to deal with hazardous waste Seal ground surface of temporary storage sites with impermeable membranes to protect percolation of leachates to ground water table Ensure that good laboratory practice including proper microbial waste management is put in place (such as use of autoclaves to treat residual microbes) and the standard practice is adhered to in the labs	CPC	ETB 8,000.000.00 (one time cost) Training: cost already included above High temperature incinerator: This requires a detailed assessment of the type and quantity of dangerous waste that might be generated inside the premises of the NQI institutions based on which a proper incinerator would be built. For this purpose a lump sum package is allocated that includes detailed assessment, some training for safety and environment team members, as well as

Identified Impacts	Enhancement/Mitigation Measures	Responsible Body	Estimated cost (ETB)
	Provide training to the right staff on good laboratory practice including appropriate microbial management systems		design and construction of the incinerator. This sum also includes the cost for purchase of impermeable membrane. A lump sum of ETB 8 million is budgeted for this.
Fire hazards	Make sure that each block including warehouses, office buildings, laboratory facilities are equipped with standard hose reels fire detection and alarm systems, smoke detection systems, security monitoring systems, fire suppression systems, and other relevant systems Make sure that standard hydrants are available and properly working in the compound	PMU @ MoST	Part of the NQI institutions' normal and regular operation cost
Radiation hazards	Procure and import laboratory radiation equipment as per Ethiopia's Radiation Protection Proclamation (No. 571/2008) Ethiopian Radiation Protection Authority (ERPA) monitors workers safety requirement for radiation exposure ((In this case, it should not exceed the IAEA's requirement: 20 mills sv/per annul) Ensure that ERPA radiation protection legislations, standards and procedures are enforced at ECAE radiation lab/s Ensure that relevant staff at ECAE are trained on radiation protection on a regular basis as well as use radiation safety manual	CPC and ERPA	Training: cost already included above
Impact of road reverberation on NQAI operations	Undertake regular monitoring to examine impacts of the road reverberation on operations	CPC	-

7. Environmental and Social Management Process

7.1. Guiding Principles

NQIDP is category 'B' for World Bank OP/BP 4.01 and the project activities/subprojects will most likely not require a full scale ESIA. However, environmental and social analysis is necessary, and appropriate ESMP or ESIA has to be prepared to prevent, minimize, mitigate or compensate for adverse impacts and maximize beneficial impacts on a sustainable basis. (*It should be noted that any project activities that would be rated as category 'A' will not be financed by NQIDP.)* Thus, the environmental and social management planning and implementation under NQIDP will be guided by the following principles.

- The planning process for sub-project activities will be participatory and all NQI institutions have the opportunity to prioritize needs; and participation in such activities will be entirely voluntary;
- The design of project activities will be guided by technical support and technical materials to avoid or minimize adverse impacts and encourage positive environmental and social effects;
- The planning and implementation of project activities will integrate appropriate ESMP or ESIA plan;
- Identified project activities by the NQI institutions will be screened, vetted and adopted by A/A EPA on the basis of selection criteria and screening designed to eliminate program activities with major or irreversible environmental or social impacts.
- When the design and implementation of ESIA is mandatory, the PMU may modify the program activities, recommend a management plan, or disapprove program activities.
- The implementation of program activities will be supervised and monitored at the level of NQI institutions as well as the PMU. Participating NQI institutions, with assistance from safeguards focal persons, will ensure that the specified mitigating measures are implemented.

7.2 Procedures and Steps

The ESMF emphasizes that project activities or subprojects planning should strive for plans and designs that avoid or minimize adverse environmental and social impacts and effectively manage such impacts. All the potential environmental and social impacts as a result of the project activities or subprojects, and associated potential mitigation measures are described in the previous chapters.

Thorough consultation was conducted with A/A EPA, to identify the key steps and procedures required during the environmental and social management process (see Figure 7-1 below).

1. ***Step one***: During project activity selection, the NQI institutions have to check whether the identified project activity is eligible or not for financing under the Project. See Annex 1.1 for further information on eligibility checklist. The Project activity will then be sent to the PMU for further consideration.

2. ***Step Two***: The PMU then informs the MoST and the CPC about the intended activities under the project.

3. ***Step Three***: The CPC undertakes screening (see Annexes 1.1 and 1.2) of project activities to ascertain the likely social and/or environmental impacts that it may entail. Impact rating should be calculated both in terms of consequence of impacts and probability of impacts as depicted in Chapter 6 of this report so as to avoid subjective impact analysis. Please also consult with relevant GoE's proclamations (e.g. Radiation Protection Proclamation (No. 571/2008)) and standards (e.g. Environmental Standards). Those project activities with no potential adverse impacts can be directly approved by Addis Ababa Environmental Protection Authority (AAEPA). For those project activities likely to have low to moderate impacts may be modified if suitable mitigation measures are incorporated into the design by NQI institutions. Mitigation measures can be referred from Annex 5. Those project activities likely to have 'high' adverse impacts and 'unknown' impacts should be tagged as '**project activities of environmental and social concern**' before referring the plan for approval.

4. ***Step Four***: MoST submits the screening results and reports (Annexes 1.1 and/or 1.2) of project activities to Addis Ababa Environmental Protection Authority (AAEPA) for further review or approval.

5. ***Step Five***: AAEPA reviews the report (taking into account that most project activities may not necessarily need a full scale ESIA since NQIDP is category B) and any other required document to decide if an ESMP/ ESIA is required. The Review report to the MoST should include i) the decision on each project activity whether an ESIA is required or not, ii) if an ESIA is required, the recommended scope of the ESIA clearly indicating the aspects to be seriously addressed, the skills required and duration of the ESIA, iii) if an ESIA is not required, include guidance on special needs such as technical guidelines and an environmental and social management plan on any of the project activities, and iv) approval without conditions for those project activities with no potential adverse impacts.

6. ***Step Six***: MoST is responsible for ensuring that the required ESMP/ESIA is conducted as per the safeguards requirements of the Government of Ethiopia and the World Bank. Please see Sample ToRs for preparing ESMP and ESIA in Annexes 3 and 4 respectively. The ESMP/ESIA can be conducted by a team of experts drawn from the NQI institutions, including the environmental safeguards specialist (to be recruited by the project) or by a consultant as deemed necessary. If a team of NQI institutions is opted, they have to be given the necessary trainings on ESMP/ESIA procedures, safeguard policies, relevant policies and ESIA guidelines before conducting the environmental and social impact study. The ESMP/ESIA report should consist of i) description of the project activity (with location), the environmental baseline, the impacts, mitigating measures, and recommendations for implementation and monitoring of the mitigating measures, among others (see Annexes 3 and 4) for detail

information on the contents of the ESMP/ESIA report). (*It should be noted that any project activities that would be rated as category 'A' will not be financed by NQIDP.)* A copy of the ESMP/ ESIA report will be submitted to the World Bank for review and comments.

7. ***Step Seven***: The World Bank will review and provide comments and inputs on the draft site specific safeguards instruments (ESMP/ESIA) to MoST.

8. ***Step Eight***: After incorporating the World Bank comments and inputs, MoST will submit the ESIA/ESMP to AAEPA for review and approval.

9. ***Step Nine***: AAEPA will review (the ESIA/ESMP) and make decision by approving the project activity (*with conditions relating to implementation*); recommending re-design (*with required and/or recommended amendments*); or rejecting the project activity (*with comments as to what is required to submit as an acceptable report*). ESIA/ESMP review should be done in the given time frame (shortest possible time) to avoid delays in project activity implementation. The result of the review has to be communicated to MoST as soon as completed (***Note***: *The final documents will be disclosed at MoST website and World Bank Infoshop as appropriate. The local level disclosure of the final ESIA/ESMP will be carried out using appropriate language and culturally sensitive manner.)*

10. ***Step ten***: MoST will inform appropriate NQI institutions to take action as per the decision of AAEPA.

11. ***Step Eleven***: Implementation monitoring will be carried out by the CPC, in consultation with the World Bank, AAEPA and those concerned.

The environmental and social management steps are summarized below (Fig. 7.1).

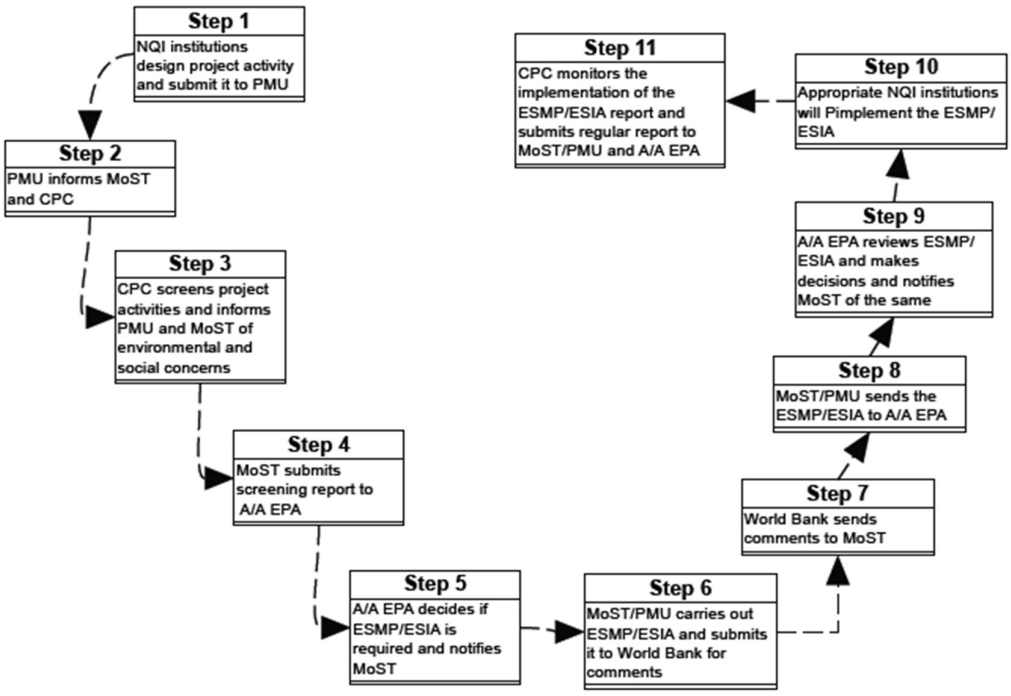

Figure 7-1: Key steps and procedures for an environmental and social management process

8. Capacity Building, Training and Technical Assistance

For the effective implementation of the environmental and social management framework, the capacity of the CPC should be enhanced through a number of interventions. Moreover, awareness raising on some key issues of accreditation, conformity and metrology services should be conducted for the general public and the business community. Given the poor technical capacity at the CPC and the NQI institutions in effectively carrying out social and environmental management actions, there is a strong need for in-house capacity building through the recruitment of two staff members. The major capacity building interventions needed for the implementation of the ESMF is listed in Table 8-1.

Table 8-1: Menu of proposed capacity building interventions

Trainings/ Capacity building supports	**Target groups**	**Indicative topics/ aspects of ESMF**	**Potential trainers /tools**	**Duration and Time of training**
Awareness raising programs at the federal and regional level through radio and TV broadcasts	General public and business community	□ The multi-faceted benefits quality compliance □ Quality compliant businesses and products □ Implementation of safeguards issues as per the ESMP □ the benefits of accreditation, conformity and metrology services □ Legal issues around quality of products	Radio and TV programs Web platforms Promotional materials Annual forums	Weekly radio program (30 min) for five years Weekly TV program (30 min) for five years Annual national forums for five years

Awareness raising	Management bodies of NQI institutions	□ Social and environmental issues and management at workplace □ Gender mainstreaming at workplace □ Radiation protection and management □ Microbial waste management	Newsletters CPC staff Gender Department ERPA staff	Monthly newsletters Biannual meetings
Training	Pertinent staff members of the NQIs and the PMU	□ The multi-faceted benefits ensuring quality of goods □ Radiation protection and management □ Microbial waste management □ Chemical management □ Use of PPEs □ Safeguards implementation, monitoring and documentation	A/A EPA social and environmental management experts; World Bank safeguard experts; ERPA staff	7 days/year, for five years
Technical support	CPC and PMU	Technical expertise on social and environmental management	One new staff member (environmental safeguards specialist)	Five years

9. Implementation, Supervision and Monitoring

Each NQI institution will prepare a proper safeguard instrument (ESIA or ESMP) for its specific subprojects in consultation with MoST. Once the required safeguard instrument is prepared, it needs to be submitted to Addis Ababa Environmental Protection Bureau, which issues environmental and social clearance following the review and approval of the documents. Then it would be the responsibility of the implementing NQI entity to implement the mitigation measures identified in the approved safeguard instruments. Each implementing entity will assign a person, who will be responsible for implementing the mitigation measures, submitting regular reports and liaising with CPC on the same. Safeguards coordinator/s at CPC will monitor and oversee the implementation of mitigation measures as per the environmental and social management plan. The design of the process monitoring and reporting procedures need to be prepared in parallel with the preparation of the activity plan for each NQI implementing entity. It should be made ready before the commencement of the implementation of the program activities.

The monitoring will also focus on compliance and effectiveness of the ESMF and application of the recommended standards in order to confirm that the necessary mitigation measures are considered and implemented. As such, results will be monitored to support compliance with safeguard policies, to identify the emergence of any unforeseen safeguard issues, to determine lessons learnt during project activities implementation; to provide recommendations for improving future performance; and to provide an early warning about potential cumulative impacts. Furthermore, the

World Bank will conduct periodical reviews of the implementation of the ESMF and other safeguard instruments under NQIDP.

NQIDP will also include a Mid-Term Review approximately 24 months after project effectiveness to assess progress and identify areas for course correction where needed. An Implementation Completion and Results report (ICR) will be prepared at the end of the project period as per WBG procedures.

The implementing NQI institutions will report quarterly and annually to the CPC on their respective activities during the preceding quarter and year, respectively. These quarterly and annual reports should capture the experience with implementation of the ESMF procedures. A sample quarterly and annual reporting form is annexed (Annex 2). The purpose of these reports is to provide:

- A record of the subproject transactions;
- A record of experience and issues running from quarter-to-quarter/year-to-year throughout the subproject that can be used for identifying difficulties and improving performance; and
- Practical information for undertaking an annual review.

Putting in place a robust system of compliance monitoring and reporting would help to analyze emerging issues and suggest appropriate measures. The CPC compiles the information and prepare quarterly and annual ESMF performance reports for submission to the PMU. The CPC shall ensure that any periodic review of the whole project addresses the project's social and environmental concerns. The objective of such reviews is to assess project performance in complying with ESMF procedures, learn lessons, and improve future performance. The lessons from these reviews will be used by the PMU to improve procedures and capacity for ESMF implementation.

9.1 Environmental and social auditing

Environmental and social auditing can be defined as "a systematic, periodic, documented and objective review of project activities related to meeting environmental and social requirements." An audit should assess the actual environmental and social impact, the accuracy of prediction, the effectiveness of mitigation and enhancement measures, and the functioning of monitoring mechanism. Further, the review should be systematic and objective. The objectives of environmental and social audits are to:

- Verify compliance with environmental and social requirements;
- Evaluate the effectiveness of environmental and social management plan prepared; and
- Assess risk from regulated and unregulated practices.

Auditing has been universally accepted as one of the components of Environmental and Social Management Plan (ESMP) and should be undertaken after construction, during operation, and upon the completion of the project decommissioning as well in the entire life of the project.

Since the project is implemented within Addis Ababa and under the oversight of the MoST, auditing environmental and social requirements is a task that will be carried out by the Ministry. Environmental and Social audits can be done once every year during

the project's life. The audit report should be communicated to the implementing agencies. For the purposes of auditing and monitoring, useful guidelines are annexed with this report (Annexes 5 and 7).

9.2 Monitoring and Evaluation Plan

The Cleaner Production Center under MoST will take charge of regular monitoring of the implementation of the mitigation measures (Table 9-1).

Table 9-1: Monitoring and Evaluation Plan

Parameters	Measures	Institutional Responsibility	Monitoring Frequency	Monitoring Indicators	Monitoring Cost, ETB[3]
Institutional capacity	Strengthening the CPC as the social and environmental management and monitoring unit	CPC	Regularly until action is effected Reports of the PMU	Official statement from MoST mandating CPC for this task New staff members of the units on payrolls	
Contribution to macro economy	Enforcement of rules and regulations Building in incentive schemes for compliant businesses through, for instance, popularization schemes using online and media outlets as well as organizing annual events with the Ethiopian Chamber of Commerce and consumer association/s	CPC	Quarterly and annually	Annual event reports Website information Regular reports Copies of newsletters	
New types of business opportunity	Popularizing these new businesses through online and other media outlets	CPC	Quarterly and annually	List of new businesses accredited by the NQI institutons	
Enhancing competitiven	Encourage the involvement of large number of	CPC	Quarterly and annually	Annual event reports	

[3] A total of 5% of the management plan is allocated as a lump sum for implementing the monitoring plan.

Parameters	Measures	Institutional Responsibility	Monitoring Frequency	Monitoring Indicators	Monitoring Cost, ETB[3]
ess in the market	private and public firms in accreditation activities Raise awareness of private businesses about the benefit of being accredited, conformity assessment, and getting metrology services			Website information Regular reports Copies of newsletters	
Provision of quality goods and services	Raise community awareness towards the benefit of consuming goods with good quality so that	CPC	Quarterly and annually	Annual event reports Website information Regular reports Copies of newsletters	
Improved social accountabilit y to firms	Enforcement of rules and regulations Building community awareness on quality issues	CPC	Quarterly and annually	Annual event reports Website information Regular reports Copies of newsletters	
Occupational safety and health issues					
Impacts on occupational safety and health	Strengthening CPC as the social and environmental management and monitoring unit The PMU should implement good laboratory practice in all labs to ensure proper handling, storage, use, and disposal of chemicals based on local and international	CPC	Quarterly and annually	Copies of documents depicting chemical management systems Availability of facilities allowing for proper handling, use, storage, and disposal of chemicals Copies of local labor	

Parameters	Measures	Institutional Responsibility	Monitoring Frequency	Monitoring Indicators	Monitoring Cost, ETB[3]
	standards and regulations. Training staff in relevant aspects of proper handling, use, storage, and disposal of chemicals. Promoting the use of PPEs in laboratories and enforcing rules regarding proper use of PPEs for vulnerable staff			union reports carrying workers' grievances Training reports Periodic monitoring reports of NQI institutions Periodical renewal of ERPA license for the radiation lab Personal observation of PPE use in the facilities	
Environmental issues					
Air pollution	Provide safety devices for construction workers Wetting walls during times of demolition	CPC	During the construction phase	Personal observation of safety devices being used during construction	
Soil and ground water pollution	Adopt good solid and chemical waste management procedures including segregation at source, minimize waste, promote re-using and recycling, and good laboratory practice. Provide training to the right staff on solid, liquid and chemical waste management	CPC	Quarterly and annually	Documents showing waste management plan and reports on implementation Training reports Assessment report on the proper type of incinerator for the facility	

Parameters	Measures	Institutional Responsibility	Monitoring Frequency	Monitoring Indicators	Monitoring Cost, ETB[3]
	Put in place high-temperature incinerator to deal with hazardous waste Ensure that good laboratory practice including proper microbial waste management is put in place (such as use of autoclaves to treat residual microbes) and the standard practice is adhered to in the labs Provide training to the right staff on good laboratory practice including appropriate microbial management systems			Observation and report on the presence of a properly functioning incinerator ground surface of temporary storage sites covered by impermeable membranes	
Fire hazards	Make sure that each block including warehouses, office buildings, laboratory facilities are equipped with standard hose reels fire detection and alarm systems, smoke detection systems, security monitoring systems, fire suppression systems, and other relevant systems Make sure that standard hydrants are available and properly working in the compound	CPC	Quarterly and annually	Availability of fire fighting systems and tools in each block inside the premises of the NQI institutions Conversation with employees on fire incidences	

Parameters	Measures	Institutional Responsibility	Monitoring Frequency	Monitoring Indicators	Monitoring Cost, ETB[3]
Radiation hazards	Procure and import laboratory radiation equipment as per Ethiopia's Radiation Protection Proclamation (No. 571/2008) Ethiopian Radiation Protection Authority (ERPA) monitors workers safety requirement for radiation exposure Ensure that ERPA radiation protection procedures are enforced at ECAE radiation lab/s (See Annex 6) Ensure that relevant staff at ECAE are trained on radiation protection on a regular basis as well as use radiation safety manual Ensure compliance with international operating standards such as ISO 17025	CPC and ERPA	Annually	NQI institutions report CPC annual report Periodical renewal of ERPA license for the radiation lab	
Impact of road vibration on NQAI operations	Undertake regular monitoring to examine impacts of the road vibration on operations	CPC	Quarterly and annually	Conversation with department heads on trends regarding magnitude and impacts of road vibration	

10. Total Social and Environmental Cost

The total environmental cost (excluding costs of those measures that are part and parcel of the design, and regular operation and supervision activities) is estimated as shown in Table 10.1.

Table 10-1: Estimated Total Social and Environmental Cost

Component	Cost, ETB					
	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Mitigation Cost[4]	5,035,000.00	13,035,000.00	5,035,000.00	5,035,000.00	5,035,000.00	33,175,000.00
Monitoring Cost (5%)	251,750.00	651,750.00	251,750.00	251,750.00	251,750.00	1,658,750.00
Total Mitigation and Monitoring Cost	5,286,750.00	13,686,750.00	5,286,750.00	5,286,750.00	5,286,750.00	34,833,750.00
Contingency (10%)	528,675.00	1,368,675.00	528,675.00	528,675.00	528,675.00	3,483,375.00
Grand Total	5,815,425.00	15,055,425.00	5,815,425.00	5,815,425.00	5,815,425.00	38,317,125.00

[4] The mitigation cost is predominantly considered as capacity building cost, which includes awareness raising, training, and provision of office equipment, furniture and stationery, as well as technical equipment.

11. Gender equality and Social Inclusion

Women are in a disadvantaged position in all aspects of life in Ethiopia. In the overall system, women benefit less from social services like education, health, etc., and hold lower positions in the economic and political affairs of the society. To enhance the benefit of women and promote their participation in the political and economic spheres, Ethiopia has developed a number of policy resolutions addressing gender inequality and women empowerment such as the Women National Policy (1993), the federal Constitution (1995), and the Amended Labor proclamation No. 377/2003. These regulations promote mainstreaming of gender in all its development strategies to address gender inequality. Women's National Policy[5] was formulated and adopted in 1993 in order to tackle gender inequality. The national policy was formulated with the objectives of creating and facilitating conditions for equality between men and women; creating conditions to make women beneficiaries of social services; and eliminating stereotypes, and discriminatory perception and practices that constrain the equality of women[6].

The 1995 Constitution of Ethiopia under Article 35 guarantees the rights of women for equal employment, participation and consultation, get affirmative actions, and share benefits of development endeavors. The Labor Proclamation No. 377/2003 also stipulates that women shall not be discriminated against employment and shall have access to equal payment on the basis of their sex. The same proclamation prohibits employment of women on type of work hazardous or harmful to their health (listed by the Minister). Besides, Ethiopia has also ratified UN Convention on the Elimination of all Forms of Discrimination against Women (1979).

To successfully implement national laws and internationally agreed norms, Women's Affairs Bureaus were established at federal, regional and woreda levels. Implementing agencies have the duties and responsibilities of ensuring gender mainstreaming and empowerment of women in all aspects of life of society like the political, economic, and social affairs.

Similarly, gender equality and women participation are fundamental to the World Bank to materialize social justice and address vulnerable groups. The Bank supports the designing of gender-responsive projects to engage and benefit women from the development projects. Gender mainstreaming and empowerment to ensure gender equity has to be the focus of NQI development project

During stakeholder consultation with the clients as part of NQI development project preparation for designing this ESMF, gender mainstreaming and women engagement was identified as key issues to be considered during project design and implementation. The consultation helps to identify the need to prepare a Gender Action Plan (GAP). The GAP will ensure and focus on the following main issues to mainstream gender and empower women in the project: (i) ensuring women's equitable participation in project implementation consultative meeting; (ii) conduct gender inclusive capacity development; iii) incorporating gender-responsive design features during NQI infrastructure development and services provisions; and (iv) strengthening the

[5] The Transitional Government of Ethiopia, Office of the Prime Minister (1993). National Policy on Ethiopian Women. Addis Ababa.

[6] Emebet Mulugeta (n.d). Report On Selected Practices On Gender Mainstreaming – Ethiopia

implementing agencies' institutional capacities for gender mainstreaming and women empowerment.

To achieve gender equality and benefit women equally from NQI development project, women need to be consulted during project implementation review meetings. Besides, women participation will be given due emphasis while monitoring of the project by PMU and evaluation of the project by external consultants at final stage. The consultation during project review will address the constraints on women's participation in project implementation and monitoring and evaluation (M&E). Hence, the overall monitoring framework of the project will include sex disaggregated indicators and other relevant issues of gender. Gender action plan was prepared (Table 11-1) to make NQI project gender responsive and address gender equity. Therefore, a mechanism must be built into the project to allow women staffs to be beneficiaries as men staffs in the capacity building activities. Gender mainstreaming tool to be used to deal and identify with gender issues during project design and implementation is presented hereunder.

There are practical actions that have been undertaken by NQI institutions to mainstream gender and ensure gender equity. During consultative meeting, all the stakeholders indicated that they have been addressing gender per the regulation of the government of Ethiopia (GoE). Women are given special consideration and priority in training packages and job recruitment to ensure their participation. For instance, during job requirement when men and women have got equal value, women have been selected. ECAE has also designed strategies to deliver services for women owned organizations. Consultation participants from ECAE have indicated that 15% service payment has been reduced for women. This means women pay only 85% of the cost of service and the rest 15% was covered by the organization. Besides, priority was given to women in the training packages and, as much as possible, efforts were exerted to balance the proportion of men and women training participants. There are also special training packages arranged by gender units and experts in each sector offices of NQI institutions. During employment of lab technicians, since they believe that women are more considerate, careful, and responsible in management and handling of equipment and lab setting, priority is also given for women while employment. They encourage women to be active participants in decision making and hold positions in each department.

Women were also prohibited not to move and hold heavy load objects that will affect their health and physique conditions. For example, MMIE have some works that involve lifting up heavy materials. Women are relived in doing such activities and they are not forced to move objects/materials weighting above 10kg. NMIE has also engaged in providing training community wings mainly targeting women based CBOs. The communities CBOs are formed to support NMIE's work. CBOs have a great contribution to meet their mission and support metrology activities through raising the awareness level and mobilize community members in this regard. NMIE also work to reduce the impact of x-rays on beneficiaries in medical institution mainly through supervising as well as awareness raise activities. It controls the standard of x-ray machines as well as the structure and setup of building set up to be used for this purpose.

There are some gender related issues that are indicated during consultative meeting to make NQI development project gender responsive. For instance, discussants and

informants in ENAO indicated that the existing infrastructures and facilities are not comfortable for women's' work. Hence, they indicated that infrastructure upgrading work will consider women and make the whole physical and working environment to be comfortable for them. There are specific concerned gender departments and units established to address gender issues in NQI institutions, except for ESA.

As discussed in the social baseline, the total numbers of currently available permanent employees of implementing agencies are 547 of which the proportion of female workers accounts to about 33%. Hence, the participation of women in NQI sectors is limited and more gender-responsive activities have to be part of project life cycle.

In NQI institutions the proportion of men and women in the consulted organizations is not equal; men out weigh women quantity and the positions held. The project has to maximize and ensure equitable benefits between men and women. To this end, the project will promote active participation of women in the PMU as well as in the technical committee membership. The technical committee should monitor the implementation of gender mainstreaming checklists and propose actions to be taken to in order to address gender equality particularly gender specific training for staffs and PMU staffs. Besides, the PMU should conduct assessment to identify a variety of constraining factors that affect women participation as well as the problems they encounter in the NQI institutions.

There are four core requirements for mainstreaming gender in the NQI development project (gender mainstreaming checklist was also included under Annex 9). These are: i) whether or not all data are disaggregated by gender; ii) issues of division of labor and positions have to be assessed from gender dimensions; iii) assessment of the project, institutional arrangement, and human resources issues done from gender perspective; and iv) all project results indicators be disaggregated by gender to monitor women's participation in the project interventions/preparation of gender sensitive monitoring and evaluation plan.

Table 11-1: Proposed gender action plan

Project Components	Sub-activities of project	Gender Related Activities to be done	Responsible Body
Component 1: Strengthening Institutional Capacity	i) supporting the development of human and technical capacity of NQI institutions	✓ Provide awareness-raising activities for top officials on the gender equality ✓ Strengthen the capacity (both in material and training) of gender specialists or units in NQI institutions (If not exist, assign gender focal person and provide the relevant training to ensure gender equality) ✓ Ensure that human and technical capacity building benefits are likely to be distributed equitably between men and women (gender balance) ✓ Develop a participation strategy for men and women during project activity implementation ✓ Conduct women-specific consultation to take their views and suggestions about project implementation ✓ Hire female project staffs in PMU and assign them in the technical committee	PMU, technical committee, and MoST
	ii) Upgrading of service facilities	✓ Infrastructure upgrading should be gender responsive and women need to consulted during the renovation ✓ Assess the gender-specific implications of upgrading activities ✓ Specify the minimum number or percentage of female laborers to be employed and prohibit the use of child laborers as per the labor code of Ethiopia ✓ Provide safety materials for men and women working to address occupational health and safety issues	PMU, technical committee, and MoST
Component 2: Enhancing Private	i) support to increase the demand from the	✓ Target women entrepreneurs in trainings aimed to strengthen the	PMU, technical

Project Components	Sub-activities of project	Gender Related Activities to be done	Responsible Body
Sector Engagement -	private sector for NQI services where public-private dialogue on NQI topics would be one medium;	capacity of private sector players in standards ✓ Organize gender sensitive forums and maintain gender equity of participants	committee, and MoST
	ii) support to private sector enterprises and associations involved in providing quality assurance services.	✓ Provide priority for women-owned business certification and develop their capacity ✓ Document sex-disaggregated beneficiary data and relevant measures taken to ensure gender equality	PMU, technical committee, and MoST
Component 3: Project management & Monitoring & Evaluation		✓ Communication strategy and channels should address and capture the attention from women and men ✓ Develop a participation strategy for men and women during project monitoring and evaluation ✓ Develop a feedback mechanism in which both males and females will have a say ✓ Disaggregate all relevant indicators by gender, such as number of women access to capacity building, working in PMU, etc. ✓ Measure the impacts of the project components on women and men	PMU, technical committee, and MoST

12. Grievance Redress Mechanisms (GRM)

GRM provides a formal avenue for affected people or stakeholders to engage with the project implementers or owners on issues of concern or unaddressed environmental and social impacts. People adversely affected (or about to be affected) by a development project will raise their grievances and dissatisfactions about actual or perceived environmental and social impacts in order to find a satisfactory solution. Not only should affected persons be able to raise their grievances and be given an adequate hearing, but also satisfactory solutions should be found that mutually benefit the project and affected persons. It is equally important that project affected people have access to legitimate, reliable, transparent, and efficient institutional mechanisms that are responsive to their complaints. The objective of the GRM is to ensure that the views and concerns of those affected by NQIDP activities are heard and acted upon in a timely, effective and transparent manner. NQI institutions manage conflicts/ complaints in an organized and transparent manner. All cases and the ways they were addressed are registered and documented. Conflicts related to NQIDP will be addressed using the existing grievance redress mechanism function in NQI institutions. There are set procedures and strategies to address internal conflicts/ complaints (customers' related complaints/conflicts) and internal conflicts (workers' related conflict). Details of the grievance redress procedures and the sample grievance form to be used during project implementation are attached under Annex 8.

In addition to this, there is a World Bank mechanism on Grievance Redress available for anyone with complaints about the project. Accordingly,

Communities and individuals who believe that they are adversely affected by the World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel, which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit http://www.worldbank.org/GRS. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

13. References

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14. Annexes

Annex 1: Environmental and Social Impact Screening Checklist for Implementing and Regulating Agencies

Annex 1.1. Eligibility checklist for project activities or subprojects (Form 1)

Subproject Name: _____ NQI institution; _____;
Woreda: _____; Kebele: _____

Answer the following questions to determine if the project activity/subproject is eligible or not*		
Will the sub-project:	Yes	No
Involve the release of radiation beyond acceptable limits (In this case, it should not exceed the IAEA's requirement: 20 mills sv/per annul)		
Cause large-scale physical disturbance of the site or the surroundings		
Release hazardous chemicals and/or wastes into the air, soil and/or water		
Release microbial waste into the environment		
Entail harm and occupational hazard to workers		
Contravene international and regional conventions on environmental issues		

***** *Please see Chapter 6 to avoid any subjective impact analysis as well as relevant GoE's proclamations (e.g. Radiation Protection Proclamation No. 571/2008) and standards (e.g. Environmental Standards).*

Eligibility Recommendations:

*(It should be noted that if you answer is **"YES"** to any of the questions above, your project activity is not eligible and has to be rejected unless the features can be avoided by change of design and/or other appropriate mitigation measures.*

Program activity is eligible and approved: ☐

Project activity is not eligible and rejected: ☐

CPC staff who did the eligibility check:

	Name(s)	Signature	Date
1.	_____	_____	_____
2. .	_____	_____	_____

Screening supervised and approved by:

Name……..…. Position: ……..Signature: ……... Date: …….....

1. _____ _____ _____ _____

Annex 1.2. Screening checklist for subprojects/project activities needing special attention (Form 2)

A. Project activities/subprojects of environmental and social concern

- Name of Subproject/project activity:_____;
- Address:- Sub-city: _____; Woreda: _____; Kebele: _____
- Focal person who did the screening: _____

Date: _____ Signature: _____

Feature of Concern: Will the project activity/subproject	Yes	No
Use chemicals		
Use radiation		
Have chemical wastes, disposal and pollution issues		
Involves land acquisition, or loss of assets, or access to assets on the land		
Others (please mention)		

If the project activities have any of the above features ('Yes' answers), the CPC focal person/expert, with the NQI institutions, notifies the MoST and the AAEPA to make sure that the necessary procedures and guidelines are followed as per Annexes 3, 4, 5 and/or 6. In addition, the Project activities have to be screened for any potential environmental and social concern and can be screened using the checklist shown below.

Recommendations

Sub-project needs special attention: ☐

Sub-project does not need special attention ☐

Screening supervised and approved by:

Name……..… Position: ……..Signature: ……... Date:

1. _____ _____ _____ _____

B. Checklist for environmental and social impact rating for project activities or subprojects of environmental and social concerns

Impact rating will be calculated both in terms of consequence of impacts and probability of impacts as depicted in Chapter 6 of this report so as to avoid subjective impact analysis. Please also consult with relevant GoE's proclamations (e.g. Radiation Protection Proclamation (No. 571/2008); and Procedures and regulatory requirements for fixed facilities for industrial/screening radiography (see Annex 6)) and standards (e.g. Environmental Standards).

Will the project activity/subproject (related with Component 1) have	Rate of Impacts				
	None	Low	Medium	High	Unknown
Soil contamination due to poor management of laboratory chemicals and contaminated wastes (solid and liquid wastes)					
Health hazards to the laboratory community during handling, storage, use of chemicals, and disposal of chemical wastes					
Health problems due to demolition/ refurbishment of existing NQI structures					
Radiation safety issues					
Radiation waste					

Potential groundwater pollution					
Other (specify):					

Summary of assessment (based on field visit):

_____
_____
_____

Environmental Category (B or C) of the project activity/ subproject (with justification):

_____
_____
_____

Recommendation

☐ Approved without condition (*Project activity is not of environmental and social concern and approved*)

☐ Partial ESIA required:

☐ ESMP required:

☐ Rejected; reasons for rejection:

☐ Others (specify):

Certification (for all approved project activities/subprojects): I certify that all the potential adverse effects of the project activity have been thoroughly examined, and the project activity/subproject does not have any impact and/or the mitigation measures in the plan are adequate to avoid or minimize all adverse environmental and social impacts.

Completed by: [Name of AAEPA Focal/responsible person – type here]
Position: [type here]
Date: [type here]
Reviewed by: [Name – type here]
Position: [type here]
Date: [type here]

Annex 2: ESMF Quarterly and Annual Reporting Form
This annual report form needs to be completed by respective NQI institutions.

1. General

NQI institution: [Type here]
Reporting Year: [type here]
Date of the report: [Type here]

2. Report summary (narrative):

Here the narrative of the ESMF implementation during the reporting period is summarized. The figures in the report are discussed here. The ESMF implementation monitoring activities carried out including aspects monitored, issues identified, proposed solution and follow up activities are summarized here.

Annex 3: Guideline for ESMP Preparation

The ESMP should be formulated in such a way that it is easy to use. References within the plan should be clearly and readily identifiable. Also, the main text of the ESMP needs to be kept as clear and concise as possible, with detailed information relegated to annexes. The ESMP should identify linkages to other relevant plans relating to the project, such as plans dealing with resettlement or indigenous peoples issues. The following aspects should typically be addressed within ESMPs.

Contents of Environmental and Social Management Plan

Description of the subproject

The subproject description should be based on the project feasibility study. Not all the detailed subproject information needs to be included as much of it is unnecessary for the environmental review. The subproject description should present a condensed description of those aspects of the subproject likely to cause environmental effects. The subproject should be described in terms of its basic activities-series of activities to carry out laboratory analysis, location, layout, and schedule (in terms of the project life cycle). This subproject description section of the report should furnish sufficient details to give a brief but clear picture of the following:

- Type and nature of the subproject.
- Need for the subproject.
- Location (use maps showing general location, specific location, subproject boundary and subproject site layout).
- Size or magnitude of operation, including any associated activities required by or for the subproject.
- Description of the subproject, including drawings showing subproject layout, activities of subproject, etc.

Description of the environment

A clear description of the organization delineation of the study area is important to define the area within which impacts must be considered. Once the study area is well defined, studies to gather the baseline conditions for valued environmental components must be developed. These components and values include, to the extent applicable (but are not necessarily limited to):

- Physical components
- Ecological components
- Human and economic development
- Quality of life values

It is not necessary to gather information on all the components listed in such environmental component checklists. The baseline studies should concentrate on identifying those environmental components that may be significantly impacted by the project.

Description of the adverse impacts

The predicted adverse environmental and social impacts for which mitigation is required should be identified and briefly summarized. Cross-referencing to the environmental and social assessment (ESA) report or other documentation is recommended, so that additional detail can readily be referenced.

Description of mitigation measures

The ESMP identifies feasible and cost effective measures to reduce potentially significant adverse environmental and social impacts to acceptable levels. Each mitigation measure should be briefly described with reference to the impact to which it relates and the conditions under

which it is required (for example, continuously or in the event of contingencies). These should be accompanied by, or referenced to, designs, equipment descriptions, and operating procedures which elaborate on the technical aspects of implementing the various measures. Where the mitigation measures may result in secondary impacts, their significance should be evaluated.

Description of monitoring program

Environmental performance monitoring should be designed to ensure that mitigation measures are implemented, have the intended result, and that remedial measures are undertaken if mitigation measures are inadequate or the impacts have been underestimated within the ESA report. It should also assess compliance with national standards and World Bank requirements or guidelines.

The monitoring program should clearly indicate the linkages between impacts identified in the ESA report, indicators to be measured, methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions, and so forth. Although not essential to have complete details of monitoring in the ESMP, it should describe the means by which final monitoring arrangements will be agreed. Responsibilities for mitigation and monitoring should be clearly defined. The ESMP should identify arrangements for coordination between the various factors responsible for mitigation.

Implementation schedule and reporting procedure

The timing, frequency, and duration of mitigation measures should be specified in an implementation schedule, showing links with the overall project implementation plans (PIP). Where implementation of mitigation measures is tied to the project legal agreements, these linkages should be outlined. For example, some mitigation measures may be made conditions for loan effectiveness or disbursement. Procedures to provide information on the progress and results of mitigation and monitoring measures should also be clearly specified.

Cost estimates and sources of funds

These should be specified for both the initial investment and recurring expenses for implementing all measures contained in the ESMP, integrated into the total project costs. Where practicable, decisions regarding appropriate mitigation measures should be justified by an economic evaluation of potential environmental impacts, aimed at:

- Measuring the cost-effectiveness of different mitigation options where a project is required to meet a set of environmental standards or achieve specific environmental objectives
- Determining the appropriate level of mitigation where there is scope for a trade-off between environmental quality and the costs (and benefits) of achieving it
- Internalizing the economic value of residual impacts or intended environmental improvements into the final economic appraisal of the project.

It is important to capture all costs—including administrative, design and consultancy.

Annex 4: Sample ToR for ESIA Preparation

Introduction

This terms of reference has been prepared as a general guideline for the preparation of an Environmental and Social Impact Assessment for use with project activities that would be implemented within the scope of the NQIDP. *[Please give more details about the project activities/subprojects and its components [here]]*

Objectives of the ESIA

The aim of the study is to achieve the following objectives:

- To review of existing Environmental and Social Impact Assessment (ESIA) reports.
- To identify and assess potential environmental and social impacts of the project activity.
- To identify all potential significant adverse environmental and social impacts, of the projects and recommend measures for mitigation.
- To review and develop an Environmental and Social Management Plan (ESMP)
- To prepare an Environmental and Social Impact Assessment and ESMP reports compliant to the relevant authorities, and detailing findings and recommendations.

Specific Objectives

- Document existing environmental and social baseline information in the project site;
- Evaluate project options and advise on the most appropriate option taking into account a combination of environment and social dimensions;
- Outline project activities that will be undertaken during implementation of project works;
- Review national policy, legal and administrative framework relevant to the development of the project;
- Conduct public consultations and describe disclosure requirements;
- Identify the negative environmental and social impacts of the project and propose feasible mitigation measures to address such impacts;
- Outline an Environmental and Social Management Plan (ESMP) and define the institutional structure to guide the implementation of the ESMP;
- Provide a set of recommendations for the project design to avoid and/or minimize the negative impacts and maximize the positive impacts of the project.

Scope of the ESIA

- Establish baseline environmental (bio-physical, social) description of the project setting including both direct and indirect impacts;
- Provide justification for the project taking into account national development policies and strategies;

- Identify stakeholders (including clients of the NQIs) and assess implications of the project activity on them;
- Identify and review national legislations and institutional frameworks governing social and environment management related to the project;
- Identify and hold consultative meetings with key stakeholders of the project focusing on issues of environmental, social as well as occupational safety and health;
- Identify and provide a description and evaluation of possible project alternatives in terms of the technology, design and layouts, levels of works in consideration of the project sites. The assessment of alternatives should cover assessment of the sites, routes and alignments for the project infrastructures. An analysis for each alternative in terms of cost and technical feasibility should be given and the best option justified;
- Describe development activities to be undertaken in the project and map out key environmental and social impacts of the project in terms of their extent, duration and reversibility. The ESIA should provide matching feasible mitigation measures for such impacts;
- Assess noise and vibration effects on NQI facilities associated with the construction and operation of the proposed facilities;
- Identify wastes from the implementation and operations of the project. These should include details of the processes for each activity, generation of wastes, types, quantity and methodology for collection, storage, treatment and disposal of wastes. Measures for the effective management of all categories of wastes should be outlined in the ESIA study;
- Occupational health and safety issues during the construction and operation of the project activity are to be outlined in the ESIA in line with national occupational health and safety requirements. This should comprehensively cover among others protections against, exposure to dust and hazardous materials that may be present in construction materials and demolition waste and a host physical hazards associated with the use of heavy equipment in line with this nature of project;
- Prepare an Environmental and Social Management Plan (ESMP) detailing measures for addressing potential negative environmental and social impacts of the project. In addition, the ESMP should clearly identify institutional roles, responsibilities and costs in addressing the mitigation measures that will be proposed in the ESIA; and
- Propose a Monitoring Plan with clear monitoring indicators and institutional roles to be used in tracking the implementation and compliance of the proposed mitigation measures.

Reporting Requirements: ESIA reporting shall be guided by the provisions in the national EIA law (Proclamation No. 299/2002) and procedural and substantive guidelines.

Duration of the Assignment and Timing for the ESIA: The assignment shall be completed within 2 man-months from the time of signing the Contract Agreement.

Required Competences for the ESIA Study: The ESIA Consultant (or team leader) should hold the following experience and expertise:

- The consultant (or team leader) should be a holder of a masters degree or above in environmental sciences, environmental engineering or similar disciplines.
- Relevant trainings on EIA is an added value.
- He or she must, at a minimum, have 10 years of experience in conducting ESIA studies or other similar tasks. In addition, he/she must be registered as an Environment Practitioner from the Ministry of Environment, Forest and Climate Change.
- Experience working with World Bank projects is an advantage.

Annex 5: Checklist of Potential Negative Impacts and Possible Mitigation Measures for Project Activities

Types of project activities	Potential negative impacts	Examples of possible mitigation measures
Institutional strengthening: Refurbishment of buildings	Dust and pollution of air Demolished wastes	• Provision of safety devices for construction workers • Wetting walls during times of demolition • Set aside appropriate sites for temporary storage and dumping of demolished waste.
Institutional strengthening: Procurement and use of laboratory and testing equipment	Leakage of chemicals and chemical wastes into the soil resulting in soil pollution and ground water pollution.	• Put in place sound solid and chemical waste management procedures including segregation at source, minimize waste, promote re-using and recycling • Proper storage and management of laboratory chemicals and reagents • Provision of training to the right staff on safe handling, storage and use of chemicals; and solid, liquid and chemical waste management • Seal ground surface of temporary storage sites with impermeable membranes • Put in place high-temperature incinerator to deal with hazardous waste (liaise with the ELA)
	Impacts on occupational safety and health	• Strengthening CPC as the social and environmental management and monitoring unit • Providing training to relevant staff in relevant aspects of solid, liquid, and chemical waste management. • Promoting the use of PPEs in laboratories and enforcing rules regarding proper use of PPEs for vulnerable staff
	Radiation	• Procure and import laboratory radiation equipment as per Ethiopia's Radiation Protection Proclamation (No. 571/2008) • Ethiopian Radiation Protection Authority (ERPA) monitors workers safety requirement for radiation exposure (In this case, it should not exceed the IAEA's requirement: 20 mills sv/per annul) • Ensure that ERPA's radiation protection legislations, standards and procedures are enforced at ECAE radiation labs • Ensure that relevant staff at ECAE are trained on radiation protection on a regular basis as well as use radiation safety manual

Types of project activities	Potential negative impacts	Examples of possible mitigation measures
		• Ensure compliance with international operating standards such as ISO 17025
	Microbial waste	• Put in place GLP including proper microbial waste management (such as use of autoclaves to treat residual microbes) • Provide training to the right staff on good laboratory practice including appropriate microbial management systems
Institutional strengthening: Capacity building, including upgrading the competence/ expertise of personnel at NQIs	Low participation and under-representation of female staffs during the project implementation	• Allowing women to be employed in the PMU and involve them as technical committee members • Building in awareness raising program for management bodies of the implementing agencies on gender mainstreaming and women empowerment • Providing special training packages need to be designed for women on gender mainstreaming and awareness raising • Ensuring active participation of women during project design, monitoring and evaluation to address their needs
Institutional strengthening: Implementation phase	Fire hazards	• Ensuring that each block including warehouses, office buildings, laboratory facilities are equipped with standard hose reels fire detection and alarm systems, smoke detection systems, security monitoring systems, fire suppression systems, and other relevant systems • Ensuring that standard hydrants are available and properly working in the compound
	Impact of road reverberation on NQAI operations	Undertaking regular monitoring to examine impacts of the road reverberation on operations

Annex 6: Procedures and regulatory requirements for fixed facilities for industrial/screening radiography

Ethiopian Radiation Protection Authority (ERPA)
P.O. Box 20486 Code 1000
Addis Ababa, Ethiopia

1. PROCEDURES

Acquisition/Importation/Requirements

- Any intent for acquisition/importation/of sources or devices emitting ionising radiation has to be notified to the Authority. This is effected by filling and submitting the protocol AP-NT-01 (Found in ERPA) well before the acquisition of the source.
- The protocol requests detail information about the type of application, the equipment in question, and when to implement it (or proposed stages of implementation), etc.
- If the requirements of the ERPA are satisfied, the Customs Authority will be informed for allowing the entry of the source into the country.
- According to the Radiation Protection Proclamation 571/2008, transfer of these sources to another party by any means shall be through the permission granted by the Authority.

Documentation Requirements

Full documentation should be presented with the application for Authorisation to the Authority. These include:

- Source/Machine specifications (including: manufacturer, type of radionuclide, activity, and max. min. parameters that could be set, date of manufacture, etc) design and shipping certificate.
- Copies of agreements to transfer the source(s) to the supplier or to an authorised waste disposal facility at the end of the useful life.
- Copies of safety, operating and maintenance instructions; and ISO/IEC certification.
- The Radiation Protection Program (RPP) that include the Quality Assurance of the facility.
- Floor Layout plan of the facility
- Provision of accessories required
- Copies of educational qualifications of workers

Authorisation Process

- All practices involving ionising radiation have to be Authorised/Licensed. Application has to be submitted to the Authority about the intended practice by completing the application protocol (Can be found in the ERPA) accompanied by a covering letter.
- The application shall be reviewed for necessary documentations, safety provisions, layout of the department, basic associated equipment and accessories, safety control systems, etc.
- The design of the facility and the adequacy of the Radiation Protection Program shall be approved by the Authority to ensure public and workers safety.

- After reviewing the application and request for fulfillment if any, compliance inspection will be conducted and replied accordingly.

Administrative Requirements

The following management responsibilities have to be placed and implemented:

- Establishing written local safety rules and procedures and mechanisms for its implementation and follow up
- Establishing record keeping system
- Assignment of Radiation Safety Officer (RSO)
- Providing personal monitoring service to workers
- The design of the facility has to reduce the radiation produced around the premise to below the public limit (1μ Sv/h) to ensure public safety
- Ensuring the security of the source(s) and facility at all times
- Other conditions related to protection and safety demanded by the Authority

2. Regulatory Requirements

I SOURCES AND DEVICES DESCRIPTIONS

Minimum sources and devices descriptions and design specifications required by the ERPA are:

I-1 Sealed Source Radiographic Devices

Manufacturer	Device Model Number	Source Model Number	Device/Source Serial Number	Radionuclide	Maximum Activity	Number of Devices

I-2 X-ray Generators

Manufacturer	Model Number	Serial Number	Voltage	Current

I-3 Accelerators

Manufacturer	Model Number	Serial Number	Voltage	Current

II VERIFICATION OF SAFETY

II-1 Shielded Enclosure Design

1. Safety assessment by a qualified expert shall be performed
2. The thickness and type of shielding shall be appropriate for the types and intensity of radiation produced by the devices.
3. The sources and x-ray generators shall be properly protected from adverse environmental conditions (heat, moisture, etc.).

4. Fire detection and protection in the radiation and source storage areas shall be provided.

II-2 Safety Controls System

Safety controls for radiographic/screening operations and storage of radiation sources indicated below should be provided.

- Electrical door interlocks for entry
- Emergency stop buttons
- Installed radiation monitor
- Mechanical door interlock (e.g., key control system)
- Portable radiation monitors for enclosure entry

II-3 warning System

Signals (e.g., visible and/or audible) and posted explanations inside and outside the radiation room for:

- Source exposure or
- X-ray generator power on shall be provided

Warning notices (e.g., illuminated signs, written signs, posters, etc) shall be placed at appropriate locations including in local languages.

II-4 Safety Operations Management

Management shall be knowledgeable of the certificate of authorization and its restrictions and requirements.

Management shall provide:

- Adequate staffing levels
- Radiation Safety Officer (empowered to stop unsafe operations)
- Adequate resources for personnel training (time and money)
- Adequate equipment
- Periodic programme reviews and recommendations
- Date of the last programme review

II-5 Safety Operations Technical

1. The Radiation Safety Officer (RSO) shall have adequate knowledge and expertise in the field and shall have adequate knowledgeable about the requirements of the Regulatory Authority and the provisions of the certificate of authorization.
2. The RSO have to be provided with adequate qualified experts and given sufficient time and resources to do the job (e.g., not kept too busy with other assignments or given insufficient technical and secretarial help).
    - The RSO shall maintains knowledge of activities of workers using radiation sources
    - The RSO shall audit the performance of radiographers at temporary work sites
    - The RSO shall conduct initial and periodic training of workers

- The RSO shall maintain adequate records to demonstrate worker and public protection.
- The RSO shall give highest priority to safety and security and shall conduct all possible means to implement safety culture in a sustainable way.

The RSO shall establish and implement a system on:

- provisions for inventory of sources and accountability
- locations and uses of devices recorded including site location, serial numbers of devices, date, name of supervising radiographer
- provisions for audits and reviews of radiation safety program
- Area monitoring and follow up the personal monitoring service in consistent way

II-6 Safety Assessment and Quality Assurance

1. Any incidents or accidents shall be properly investigated and investigation reports shall be prepared and copied to the ERPA.
2. Safety assessments shall be reviewed or made based on lessons learned from any accident or accidents at similar facilities.
3. There should be a written Quality Assurance programme.
4. Maintenance and repair work shall be in accordance with manufacturer's recommendations.
5. Repair/maintenance /procedures shall be established and applied in accordance with manufacturer's recommendations.

III VERIFICATION OF WORKER PROTECTION

III-1 Classification of Areas

1. Controlled areas shall be demarcated.
2. Approved signs at access points shall be provided.
3. Radiation source storage at a physically defined location (e.g., pit, hot cell, room) shall be:
    i) Locked/secured at location with key/access/ control and supervision
    ii) Provided with radiation warning notices
    iii) Provided with proper shielding (e.g., individual containers, enclosure)
    iv) Reserved only for radiation sources
4. X-ray generators shall be properly labelled as a source of radiation:
5. Gamma radiography devices shall be properly labelled as a source of radiation:

III-2 Local Safety Rules and Supervision

1. Local safety rules shall be established in writing (including local languages) and posted at appropriate locations.
2. The local safety rules shall include investigation levels and authorized levels; and the procedure to be followed when a level is exceeded shall be established.
3. Workers shall be instructed in implementing procedures.

4. Any radiography work shall be done in accordance with prescribed operating procedures and conditions.
5. Workers shall have adequate supervision to ensure rules, procedures, protective measures and safety provisions are followed.
6. Specifically, operating and working procedures for:

    i) Setting up controlled areas; including barriers, surveillance and posting at temporary job sites.
    ii) set-up of exposures (radiation source output beam direction, use of collimators, beam height):
    iii) use of personal dosimetry and use of protective equipment such as alarming rate dosimeter:
    iv) Performing routine maintenance of cables, connectors, etc.
    v) making surveys
    vi) appropriate response to failure of a source to retract or other incident:
    vii) Safely storing sources shall be established and properly implemented.

III-3 Monitoring

1. The authorised organisation (Currently the ERPA) shall provide personal dosimeter.
2. The dosemeters shall be:

    i) Worn properly
    ii) Calibrated
    iii) Exchanged at required frequency

3. Area and portable survey instruments and other instrumentation shall be:

    i) Appropriate
    ii) Calibrated
    iii) Operational
    iv) Operational check performed before use

4. The authorised organization's surveys shall indicate that the radiation room shielding is adequate and the dose rates around the room meet authorised radiation levels.
5. The authorised organization shall make periodic tests for leakage of radioactive materials from sealed sources.

IV VERIFICATION OF PUBLIC PROTECTION

IV-1 Control of Visitors

1. Visitors shall be accompanied in controlled area.
2. Adequate information shall be provided to visitors entering controlled areas.
3. Adequate control over entries into supervised areas and appropriate postings shall be made.

IV-2 Sources of Exposure

1. The shielding and other protective measures shall be optimized for restricting public exposure to external sources of radiation.
2. The floor plans and arrangement of equipment shall be as described in the application and appropriate consideration shall be given to any public area adjacent to the installation.
3. Provisions shall be made to detect and control contamination in the event of a leaking source.

IV-3 Radioactive Waste and Discharges

1. Provisions and agreements shall be made to transfer sources to the supplier or to an authorised waste disposal facility at the end of useful life time.
2. When sources are no longer in use and being stored, the authorised ogranisation shall have a plan for timely transfer or disposal of the sources.
3. Provisions for control of discharges to the environment in the event of contamination or leakage from a sealed source shall be made and it has to be within the authorized limit by the ERPA.

IV-4 Monitoring of Public Exposure

1. Routine periodic measurements of exposure rates in public areas adjacent to controlled and supervised areas shall be made by the RSO, staff or qualified expert.
2. The survey results shall show that the enclosure shielding is adequate and the dose rates outside the controlled and supervised areas meet authorised radiation levels, if exceeded appropriate measures shall be taken and the ERPA shall be notified.

V- EMERGENCY PREPAREDNESS

V-1 Emergency Plan

1. A written emergency plan shall be established with the required inputs and the ERPA shall review for its adequacy.
2. The plan shall be periodically reviewed and updated.
3. The plan shall take into account lessons learned from operating experience and accidents at similar facilities.
4. The procedures include recovery of radiation sources that fail return to the shielded storage device when the source drive mechanism is operated.

V-2 Training and Exercises

1. Workers involved in implementing the plan shall receive proper training.
2. Provisions shall be made of the plan to be rehearsed at suitable intervals in conjunction with any designated emergency response authorities and the ERPA.
3. Date of the last rehearsal shall be recorded, possibly supported by other documentations (video, photograph, etc.) for reference.

V-3 Verification of Records

1. A copy of authorisation certificate shall be available for inspection.
2. The following required information shall be properly recorded and kept:

   - Personal dosimetry records with current and collected dose analyzed.
   - Area surveys records.
   - Instrument tests and calibrations records.
   - Tests for leakage of radioactive material from sources.
   - Inventory of sources and accountability records.
   - Audits and reviews of radiation safety programmes records.
   - Incident and accident investigation reports.
   - Maintenance and repair work records.
   - Facility modifications records.
   - Training provided, initial and fresher.
   - Evidence of health surveillance records.
   - Waste disposals programme and records.
   - Transportation of radioactive material records like, package documentation, package surveys, transfer/receipt documents, details of shipments dispatched.
   - Log of off-site operations, location, name of responsible radiographer and date.

Annex 7: Suggested Template for ESMP Compliance Monitoring

A. Project Activity/subproject Information

1.1. Name of subproject proponent:

1.2. Subproject title:

1.3. Subproject location:

1.4. Reporting period:

B. Main findings of the monitoring, including feedback/grievance received from stakeholders:

C. Impacts/issues as per the ESMP of the subproject:

Issues (Potential impact)	Mitigating measures	Schedule/Duration of mitigating measures	Status of Compliance			Means of verification/ Remarks	Factors affecting safeguards compliance	Actions needed
			Overall target	Target as of the reporting period	Variance			

D. Conclusions and recommendations:

E. Experts / team leader who prepared/approved the report

		Name	Signature	Date
Prepared by	1.	_____	_____	_____
	2.	_____	_____	_____
	3.	_____	_____	_____
Approved by		_____	_____	_____

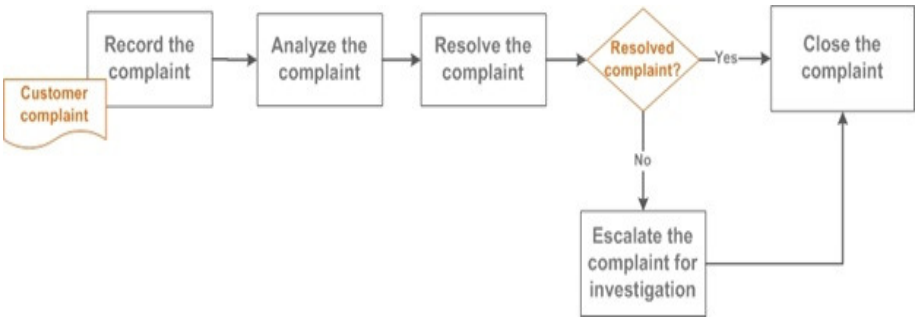
Annex 8: Grievance Redress Mechanism (GRM)

Ethiopia's NQI institutions, in one way or another, are member of, and/or regulated by international quality infrastructure institutions in the world. They are mentored and inspected by international institutions working in areas of quality infrastructure such as International Institution for Standardization (ISO), International Electro-technical Commission (IEC), Germany Accreditation Organization (DAKKS), International Laboratory Accreditation Cooperation (ILAC), and International Organization for Legal Metrology (OILM). For instance, ECAE and ENAO are members of ILAC. NMIE is a member of OILM. NMIE has accreditation and regulated by DAKKS annually. The institution is currently working to make the country member of International Bureau of Weights and Measures (BIPM). BIPM is international organ having regulatory role and function regarding weight and measurement units. Membership to BIPM is possible not as an organization rather as a country.

Besides, there is also in-country regulatory and control mechanism of NQI institutions in Ethiopia. ENAO checks and supervises other NQI organizations. The NQI institutions have accreditations from ENAO and every year ENAO inspects and supervise these institutions to checks whether or not they meet and work as per the standard. Failure to abide with the standards will cause the snatching of their national accreditation.

There are internationally established complaint and conflict redress procedures and guidelines these organizations are following and must comply with to keep continue as a member of ISO/IEC as well as to retain their national accreditation from ENAO. Failure to abide with international complaint/conflict handing mechanism would result in cancellation of membership. As result complaints/conflicts have been addressed with ISO/IEC standards.

It is the policy of ISO to objectively investigate and resolve conflicts or complaints relating to all the services provided by all member states. ISO/IEC believes that effective complaints management system can help: i) Identify opportunities for improvement of products and services; ii) eliminate the root cause of the complaints and repeated occurrence of problems, instead of just dealing with the complaints when happens; and iii) deal with a complaint in its early stages, avoiding escalations and problems. The steps for handling the complaint/ conflict are as follows:



1. Record the complaint: When a firm receives a complaint, it must be recorded appropriately in complaints system. All complaints (phone calls, e-mails, hand-written comments from the comment box, etc.) should be recorded by the corresponding responsible person.

2. Analyze the complaint: all complaints should be analyzed initially in order to decide whether a quick resolution is possible or escalation is needed. The complaints should be dealt with as soon as possible; however, a timeframe for quick resolution should be defined by each organization. If the complaint can't be resolved in this timeframe, escalation of the complaint is required, and the customer should be informed that their complaint is being investigated.

Not all complaints can be resolved quickly to the satisfaction of both parties. The procedure should set criteria for when a complaint should be escalated. General cases when complaints are escalated for investigation are:

- when a quick resolution was tried, but the customer is still dissatisfied;
- in cases of some VIP customers;
- in cases of complex and/or sensitive complaints;
- when the complaint raises complex and/or high-risk issues, etc.

3. Resolve the complaint: there should be designated persons for dealing with complaints. The two most important things that this person should take into account are what does the customer want to achieve by complaining, and can he/she resolve the complaint or should someone else be involved?

4. Investigate the complaint: In cases when a complaint is escalated for further investigation, the decision making should be on a higher management level. This step will vary by industry, types of services and products provided, the size of the company, etc.

5. Close the complaint: The responsible person should communicate the resolution to the customer by their preferred method of contact and document the resolution in the system. The feedback to the complaint should address all aspects of the complaint and provide a detailed explanation of the proposed resolution. If the customer doesn't accept the resolution, the complaint should be re-opened and escalated for investigation.

Each NQI institutions use ISO/IEC grievance redress procedures set above. Any community complaint related to environmental and social impacts of the NQI development project will be address in the same way and the process will be followed.

ESA adopts and works in line with ISO 9001/2008[7]. ISO/IEC 9001/2008 is an international standard that sets the requirements for a quality management system. ESA is currently working to adopt ISO/IEC standards into the national context. Its duty is to adapt international standards into the local context which could be used by public and private firms to be internationally competent and sustain their business and maximize their profits or services. Hence, ESA's is engaged in paper works to adopt standards rather than being an institute involved laboratory research to produce standards for the country and the globe. ECAE and NMIE manage complaints as per ISO/IEC 17025 standard. ISO/IEC 17025 specifies general requirements for the competence of testing and calibration laboratories. Clause 4.8 of this standard state that "the laboratory shall have a policy and procedure for the resolution of complaints received from customers or other parties. Records shall be maintained of all complaints and of the investigations and corrective actions taken by the laboratory". NMIE and ECAE have checklists

[7] The standard is currently revised and re-named as ISO/IEC 9001/2015

prepared for collecting customer complaints and have set timeframe for addressing them (duration of the conflict redress period varies according to the type of complaints received from customers). The have Quality Management/Assurance department responsible for conflicts/complaints in the organization.

Besides, clause 4.8 of ISO/IEC 17025 document indicated concerned bodies for handling complaints. As per the policy, it is the responsibility of management bodies (Director General, Quality Managers, Team Leaders, etc.) to ensure the effective implementation of the compliant policy and process. The policy document indicated ways of complaint receipt that can range from verbal and informal to written and formal.

ENAO address conflicts/complaints as per ISO/IEC 17011, clause 5.9. The organization developed Policy Manual (PM) 04. Clause 5.9 states that "ENAO shall receive, validate and investigate or analysis and where required take appropriate corrective/preventative actions for compliant against its staff, assessors/experts, AAC members, accredited CABs according to P05.9 (Compliant handling procedure)". ENAO has appeal receipt and handling code called clause 7.10. It receive, validate and investigate or analysis and where required take appropriate corrective/preventative actions for appeals against its adverse decision according to P07.10 (Appeals handling procedure).

Therefore, customer-worker relationship or beneficiaries' service related complaints have been handled by internationally set standards or procedures. Each member organizations are evaluated at end of each year for their conformity or addressing conflict as per the established standard procedure. Deviation or not handling conflicts or complaints as per the ISO standards leads to dismiss from membership that could lead to loss of international accreditation.

Internal workers related conflicts are also part of the ISO standard. To address internal conflicts or conflicts between workers in all NQI organizations, there is an established conflict redress committee called *Compliant hearing Committee* (in Amharic '*Kereata Semi Committee'*) which all members are forced to establish. The composition of the committee varies depending on the size of the company and is usually composed of five or six members with its own chairperson. The procedure of conflict solving is as follows: when a worker has a complaint, he/she will present his/her complaints in writings to the committee. The committee chairperson summons committee members and discuss on the issue in the presence of the complainer. They call upon the complainer to brief his/ her case and take hearings of the case. They try to give proper solution where the complaint presenter will be properly treated and get solution to his/her cases. In case where the case could not be solved by the committee members and/or needs higher officials' decision, hierarchically the case will reach to the top manager of the office. Still, if the case could not be addressed, the victim has the right to take to Ethiopian Institute of Ombudsman, and then procedurally to the legal court.

Sample Grievance Form

Personal Information and Nature of Grievance

Name (Filer of Complaint): _____

PAP's ID Number: _____

Addresses: _____ (Village; mobile phone)

Nature of Grievance or Complaint:

_____
_____

Individuals Contacted:

_____

Summary of Discussion:

_____

Signature_____ Date: _____

Name of Person Filing Complaint: _____
(if different from Filer)

Position or Relationship to Filer: _____

Signed (Filer of Complaint): _____

Review/Resolution

Date of Conciliation Session: _____

Was Filer Present? Yes ☐ No ☐

Was field verification of complaint conducted? Yes ☐ No ☐

Findings of field investigation:

_____
_____

Summary of Conciliation Session
Discussion: _____
_____
_____

Was agreement reached on the issues? Yes ☐ No ☐

If agreement was reached, detail the agreement below:

If agreement was not reached, specify the points of disagreement below:

_____
_____

Signed (Conciliator):_____ Signed (Filer):_____

Signed (Independent Observer): _____

Date: _____

Annex 9: Gender Mainstreaming Checklist

- Are men and women involved in project design?
- Is a participation strategy for men and women during project implementation and monitoring and evaluation developed and used?
- Is women-specific consultation to take their views and suggestions conducted?
- Do the project objectives identify the role of gender?
- Is TOR prepared for the gender specialist?
- Are work conditions that are conducive to women and men' health and participation prepared (e.g. laboratory facilities, construction conditions, office and toilet facilities, etc)?
- Are key gender and women's participation issues identified?
- Is a socioeconomic profile of key stakeholder groups disaggregate by gender?
- Are gender differences examined by roles, status, wellbeing, constraints, needs, and priorities, and the factors that affect those differences?
- Are men's and women's capacity to participate in trainings and working and the factors affecting that capacity assessed?
- Is the potential gender impact of the project assessed? Are options to maximize benefits and minimize adverse effects proposed and implemented?
- Are gender related policies and laws, as necessary reviewed?
- Are gender concerns addressed in the project (including project budget/ cost estimates, institutional arrangements, and M&E)?
- Are gender-disaggregated indicators developed in the monitoring and evaluation plan?

Annex 10: List of People Consulted

Attendance Sheet for Persons Contacted for the Mission- ESMF

Date: 31/09/2016

Region: AA Zone: — Woreda: — Kebele: —

S/N	Name of Participants	Sex	Age	Representation/ Organization	Position	Cell Phone	Sign
1	Mulugeta Derebew	M	40	NMIE	Department head	0929242016	
2	GIZACHEW BETRU	M	29	NMIE	A/Director(SM)	0911237835	
3	KETEMA TOLOSA	M	42	ESA	Cleaner Production projects coordinator	0911-424587	
4	YISSMA JIRU	M	43	ESA	Head, Communication & Public	0911237836	
5	Endalew Mekonen	M	36	ESA	DDG	0912 913523	

Attendance Sheet for Persons Contacted for the Mission- ESMF

Date: 05/10/2016

Region: Addis Ababa Zone: — Woreda: — Kebele: —

S/N	Name of Participants	Sex	Age	Representation/ Organization	Position	Cell Phone	Sign
1.	Mulugeta Mekonnen	M	40	ENAO	Accreditation Director	0911146536	
2.	Adugna Aledisa	M	29	ENAO	ICT Head		
					DDG Welifeled	0910[illegible]	
3	Gashaw Tefaye	M	43	ECAE	ECAE (DDG)	0911226446	

S/N	Name of Participants	Organization	Position	Tel.
1.	Roman Kassahun	MEFCC	Director, ESIA Directorate	0911794117
2	Eyob Woretaw	Addis Modjo Edible Oil	Operation Director	0911761935
3	Fikru Alemu	MoST	Agro-processing Expert	0913591490
4	Aberra Berhanu	A/A EPA	EIA Coordinator	0911183940
5	Kirubel Seyoum	Tomoca Coffee PLC	Production Manager	0911723482
6	Solomon Getachew	ERPA	Director General	0911203963

Attendance Sheet for Persons Contacted for the Mission- ESMF

Date: 08 NOV. 2016

Region: Addis Ababa Zone: Addis Ababa Woreda: – Kebele: –

S/N	Name of Participants	Sex	Age	Representation/ Organization	Position	Cell Phone	Sign
1	Desu Demissie	M	31	EDE Garment Textile Ex PLC.	Shareholder	0913148644	
2	Eyasu Ermias	M	31	”	General M. & Sh. owner	0920100835	
3	Negede Yisihak	M	28	MoST	Technology Transfer Textile expert	0916616675	
4	Wossen Hailu	F		Wossi Garment	General manager	0911405016	
5.	Habtamu Hizkiyas	M	24	” ”	Manager	0920195422	
6	Daniel Akalu	M	35	Elico- Awash	Manager	0911-640893	
7	Samuel Belayneh	M	49	Batu Tannery PLC	Prod. Tech Manager	0911384436	
8	Mamush Kebede	M	46	”	Finance Manager	0911675767	
9	Netsanet Tesfaye	M	30	MoST	Expert (leather)	0910-10-22-19	
10	Girma Negussie	M	60	K.O.JJ Food process[illegible] comp.	Quality expert	0913[illegible]001	
12	Mulugeta Tullu	M	65	K.O.JJ ”	Deputy general manager	0911355056	