Environmental Assessment and Review Framework

March 2018

Myanmar: Climate-Friendly Agribusiness Value Chains Sector Project

Prepared by the Ministry of Agriculture, Livestock and Irrigation for the Asian Development Bank.

CURRENCY EQUIVALENTS

(As of 26 March 2018)

Currency unit	–	Myanmar Kyat (MK)
MK1.00	=	$0.000753
$1.00	=	MK1,328.00

ABBREVIATIONS

ADB	–	Asian Development Bank
CDZ	–	Central Dry Zone
CFAVC	–	Climate-friendly Agribusiness Value Chains
CSA	–	climate smart agriculture
DOA	–	Department of Agriculture
EARF	–	environmental assessment review framework
ECOP	–	Environmental Code of Practice
ECD	–	Environmental Conservation Department
EIA	–	environmental impact assessment
EMP	–	environmental management plan
ESIA	–	environment and social impact assessment
ESO	–	environmental safeguards officer
FAO	–	Food and Agriculture Organization
GAP	–	good agricultural practices
GMS	–	Greater Mekong Subregion
GRM	–	grievance redress mechanism
IEE	–	initial environmental examination
IRRI	–	International Rice Research Institute
IWRUMD	–	Irrigation and Water Resources Utilization Management Department
MOALI	–	Ministry of Agriculture, Livestock and Irrigation
MONREC	–	Ministry of Natural Resources and Environmental Conservation
PIC	–	project implementation consultant
PMU	–	project management unit
PPP	–	public-private partnership
PPTA	–	project preparatory technical assistance
REA	–	rapid environmental assessment
SPS	–	Safeguard Policy Statement
TOR	–	terms of reference
WUGs	–	water user groups

NOTE

In this report “$” refers to United States dollars.

CONTENTS

EXECUTIVE SUMMARY

1. The environmental assessment and review framework (EARF) describes the procedures to be followed in the environmental assessment of subprojects prepared and implemented under the Climate-Friendly Agribusiness Value Chain Sector Project (project). The project will incorporate the environmental safeguards required by Asian Development Bank (ADB) Safeguard Policy Statement 2009, ADB Environmental Assessment Guidelines (2003), the Government of Myanmar (government) environmental laws and regulations, and any subsequent modifications and additions agreed by the executing agency and ADB.

2. Under the ADB Safeguard Policy Statement, the project has been classified as environment Category B. As this is a sector project, and Environmental Assessment and Review Framework has been prepared. Categorization under the Myanmar EIA Procedure (2015) is ongoing with the expectation that the project by categorized as an IEE type project.

3. The overall goal of the project is to support the implementation of Myanmar's Agricultural Development Strategy (ADS)[1] Myanmar's Second Five-Year Short-Term Plan which includes the following objectives:[2] (i) extend production and use of good quality seeds; (ii) disseminate modern technology; (iii) upgrade vocational education; (iv) enhance research and development activities for sustainable agriculture; (v) encourage mechanized farming, climate smart agriculture, and extend water availability to increase productivity; (vi) change laws and regulations in line with current conditions; and (vii) encourage public-private partnerships (PPP) and increase local and international investments in agriculture.

4. The project will be implemented in the Magwe, Sagaing and Mandalay Regions in the Central Dry Zone (CDZ), linked to the Greater Mekong Subregion (GMS) Southern Economic Corridor. The project will consistent of subprojects, which will be designed and assessed during project implementation.

5. As this is a sector project, an environmental assessment and review framework (EARF) has been prepared to ensure that all subprojects avoid and/or mitigate adverse environmental impacts. All subprojects will undergo environmental screening. Subproject selection criteria have been formulated to avoid significant adverse environmental impacts. Subprojects that have potential to cause significant irreversible, diverse or unprecedented adverse environmental impacts (Category A under ADB SPS) are not eligible for funding. Subprojects will be categorized either B or C. For category B projects, initial environmental examinations and environmental management plans (EMPs) will be prepared. For Category C projects, Environmental Code of Practice (ECOP) have been developed. All EMPs and ECOPs will incorporated in bidding documents and contract documents to be implemented by contractors.

6. Two sample subprojects have been assessed: (i) the Pakkoku Climate Smart Water Management subproject for which an Initial Environmental Examination has been prepared; and (ii) the Chepa Seed Farm subproject for which Environmental Codes of Practice has been prepared.

7. The Ministry of Agriculture, Livestock, and Irrigation (MOALI) is the executing agency and will be responsible for overall project coordination and management. MOALI will establish a project management unit (PMU), which will be responsible for planning and implementation of

[1] Government of Myanmar, Ministry of Agriculture, Livestock and Irrigation (MOALI). 2017. *Agriculture Development Strategy 2018-2023*. Nay Pyi Daw.

[2] MOALI, 2015.

the works. A project management implementation consultant (PIC) firm will be recruited to assist the PMU to implement the project and to meet the reporting and procedural requirements adhering to Myanmar EIA Procedure (2015) reporting and procedural requirements and relevant ADB Guidelines.

8. This EARF outlines the assessment and screening of subprojects and the procedures to follow for relevant categories (B & C) and it summarizes the anticipated impacts to be addressed at pre-construction, construction, and operation phases. It lays out the importance of public consultation and public disclosure during life of the project, and describes the establishment of the grievance redress mechanism in terms of procedure and timeframes involved.

9. An example of an environmental management plan (EMP) is assembled as Appendix 3, and cost estimates for environmental monitoring are also provided. The procedures and recommendations to fulfil the Environmental Code of Practice (ECOP) for Category C projects is also outlined, as are the rapid environmental assessment (REA) checklists.

10. The implementation arrangements and agency responsibilities for project implementation are also described, which aims to emphasize the importance of the Project Implementation Consultant (PIC) in taking a lead role to support the MOALI Project Management Unit (PMU) in all its duties including consultation, monitoring, supervision, reporting, and capacity building.

11. Terms of reference for the international environmental supervision consultant and national environment specialists of the PIC are described.

I. INTRODUCTION

A. Background

1. Under the ADB Safeguard Policy (2009), the Project has been classified as Category B, requiring an IEE. Categorization under the Myanmar EIA Procedure (2015) is ongoing with the expectation that the project be categorized as an IEE type. The environmental assessment has been prepared in accordance with requirements of the Safeguard Policy and the EIA Procedure. Public consultation was undertaken and a grievance redress mechanism has been designed to address issues and complaints that may arise during implementation,

2. As this is a sector project, an environmental assessment and review framework (EARF) has been prepared to ensure that all subprojects avoid and/or mitigate adverse environmental impacts. All subprojects will undergo environmental screening. Subproject selection criteria have been formulated to avoid significant adverse environmental impacts. Subprojects that have potential to cause significant irreversible, diverse or unprecedented adverse environmental impacts (Category A under ADB SPS) are not eligible for funding. Subprojects will be categorized either B or C. For category B projects, initial environmental examinations and environmental management plans (EMPs) will be prepared. For Category C projects, Environmental Code of Practice (ECOP) have been developed. All EMPs and ECOPs will incorporated in bidding documents and contract documents to be implemented by contractors.

3. Two sample subprojects have been assessed: (i) the Pakkoku Climate Smart Water Management subproject for which an Initial Environmental Examination has been prepared; and (ii) the Chepa Seed Farm subproject for which Environmental Codes of Practice has been prepared.

B. Project Description

4. The overall goal of the Climate Friendly Agribusiness Value Chains Sector Project (the Project) is to support the implementation of Myanmar's Agricultural Development Strategy (ADS)[3] and Myanmar's Second Five-Year Short-Term Plan which includes the following objectives:[4] (i) extend production and use of good quality seeds; (ii) disseminate modern technology; (iii) upgrade vocational education; (iv) enhance research and development activities for sustainable agriculture; (v) encourage mechanized farming, climate smart agriculture, and extend water availability to increase productivity; (vi) change laws and regulations in line with current conditions; and (vii) encourage PPP and increase local and international investments in agriculture.

5. The Project will also support the National Export Strategy and the National Comprehensive Development Plan by improving agricultural production infrastructure and the efficiency and technologies used in post-harvest practices and processing for rice, pulses and beans, and sesame. It will also support various agribusiness policies aimed at improving the quality of agricultural inputs, in developing codes of practices and standards applied to various agribusiness activities, and in creating an enabling environment for agribusinesses to conduct business more efficiently and profitably. The Project is consistent with the ADB Midterm Strategy of poverty reduction and economic growth particularly in rural areas, addressing

[3] MOALI. 2017. Agriculture Development Strategy 2018-2023. Nay Pyi Daw.
[4] Ministry of Agriculture, Livestock and Investment, 2015.

climate change through climate resilience infrastructure development, climate smart agriculture, and in conformity with the ADB Country Partnership Strategy (2014-2018) with outcomes to increase crop production and formal employment opportunities which are all inclusive. There will be direct synergies with other ADB investment projects and programs, including Irrigated Agriculture Inclusive Development Project, CASP 2, GAFSP, and with JICA and World Bank projects in the Central Dry Zone (CDZ).

6. The project will be implemented in the Magwe, Sagaing and Mandalay Regions in the CDZ, linked to the GMS Southern Economic Corridor.

7. The project has three major outputs:

8. **Output 1: Critical agribusiness value chain infrastructure improved and made climate** resilient**.** It involves infrastructure improvements to increase farm productivity and crop diversification, enhance quality of agricultural products, and increase incomes for value chain stakeholders. Key activities include:

(i) Upgrading infrastructure (irrigation, drainage, buildings, farm and post-harvest machinery and equipment, seed testing equipment, agrometeorological stations, etc.) in 10 Department of Agriculture (DOA) seed farms[5] for production of improved and/or climate resilient seed, for sale to private producers of certified seeds and eventually benefitting 167,000 farmers;

(ii) Renovating at least 130 km of tertiary canals, rehabilitating 15 community ponds and reservoirs, constructing at least 8000 shallow tube wells with some of them linked to drip and sprinkler technologies, and small-scale pumping to bring an additional 13,000 ha under irrigation benefitting at least 35,000 households;

(iii) Rehabilitating at least 300 km of farm feeder roads to climate resilient condition to provide improved farm connectivity to markets and enable enhanced farm mechanization; and

(iv) Upgrading the safety and quality testing equipment and instrumentation in MOALI Plant Protection Division's Pesticide Testing Laboratory and Food Safety Testing Laboratory, and the Ministry of Commerce (MOC) Commodity Testing and Quality Management (CTQM) Laboratory to meet ISO 17025 standards, and providing food safety testing kits to DOA plus the private sector.

9. The project will support DOA seed farms in promoting (i) strong links with the private sector, (ii) marketing, and (iii) business development services.

10. The lead seed growers and seed producer associations near DOA seed farms will be encouraged to be integrated under a public-private partnership for seed multiplication being launched by the Livelihoods and Food Security Trust Fund (LIFT) to ensure a guaranteed market for lead seed growers.

[5] Seed farms of the Department of Agricultural Research (DAR), including the Oilseed Crops Research Centre in Magway, may be supported, subject to availability of funds.

11. The project will support the formation of water user groups (WUGs) in the project area and train WUGs to operate and maintain minor canals, community reservoirs and other water management infrastructure.

12. **Output 2: Climate smart agriculture and agribusiness promoted.** This output will strengthen technical and institutional capacity to integrate climate change concerns into agriculture, and help farmers and agribusinesses to enhance productivity while addressing climate change impacts. Key activities include:

(i) Deploying climate resilient varieties of rice, beans, pulses and oilseeds;

(ii) Strengthening capacity of seed growers and farmer groups, agro-dealers, and regional government staff on appropriate climate smart agriculture (CSA) technologies, certified seed production, farm mechanization and good agricultural practices (GAP), and agribusinesses on business plan development, good manufacturing practices (GMP) and HACCP [Hazard Analysis Critical Control Points] standards, value addition and food quality and safety improvement; and

(iii) Facilitating access to agricultural inputs (climate resilient seeds and varieties, agrochemicals), farm mechanization services and off-farm rural livelihood opportunities, principally through establishing an agricultural digital finance scheme to benefit at least 35,000 smallholders.

13. The project will train farmer groups, laboratory staff, and agribusinesses in operations and maintenance (O&M) of infrastructure built under output 1.

14. The project will identify smallholder beneficiaries through “common interest groups” utilizing community-driven development (CDD) processes.

15. **Output 3: Enabling environment for climate friendly agribusiness enhanced.** Under this output, the project will invest in the creation of an enabling policy and regulatory environment for agribusinesses, the identification of opportunities for private sector engagement in climate change mitigation and adaptation, and provision of improved market information services. This output will facilitate harmonization of standards, public-private partnerships, and green financing. Key activities include:

(i) Establishing an agribusiness policy cell within MOALI’s Department of Planning (DOP) for agribusiness policy and standards formulation (including farm-gate standards and codes of practice,[6] research, analysis, and advocacy), in collaboration with MOC;

(ii) Raising awareness and capacity of financial institutions to support climate friendly agribusinesses and enhance access to financial services; and

(iii) Enhancing market and credit information networks, and the delivery of land administration services in project areas, in collaboration with FAO, through building capacity of DALMS, regional and township administrations for land

[6] Example to prevent pest infestation and reduce mycotoxins in drying and storage facilities, and adopt market-driven, end-product export standards for processors

management planning, and creating demand for such services at village level.

16. Candidate Subprojects: A long list of candidate subprojects was developed during the course of the PPTA, and a range of selection criteria developed to identify preferred ones before finalizing. The project is expected to be implemented over six years and will work in the regions of Sagaing, Magwe, and Mandalay. The main infrastructure work will be the modernization and rehabilitation of 10 Department of Agriculture (DOA) Seed Farms, including the renovation of irrigation and drainage canals, the repairing of the farm feeder roads, the construction of modern buildings for seed storage, seed laboratory, machinery, training, and warehousing; rehabilitation of at least 130km of minor irrigation canals, 15 community-owned small reservoirs, and installation of 8000 shallow tube wells, with some of them linked to drip and sprinkler technologies, and small-scale pumping; and the rehabilitation of at least 300 km of farm feeder roads to climate resilient condition.

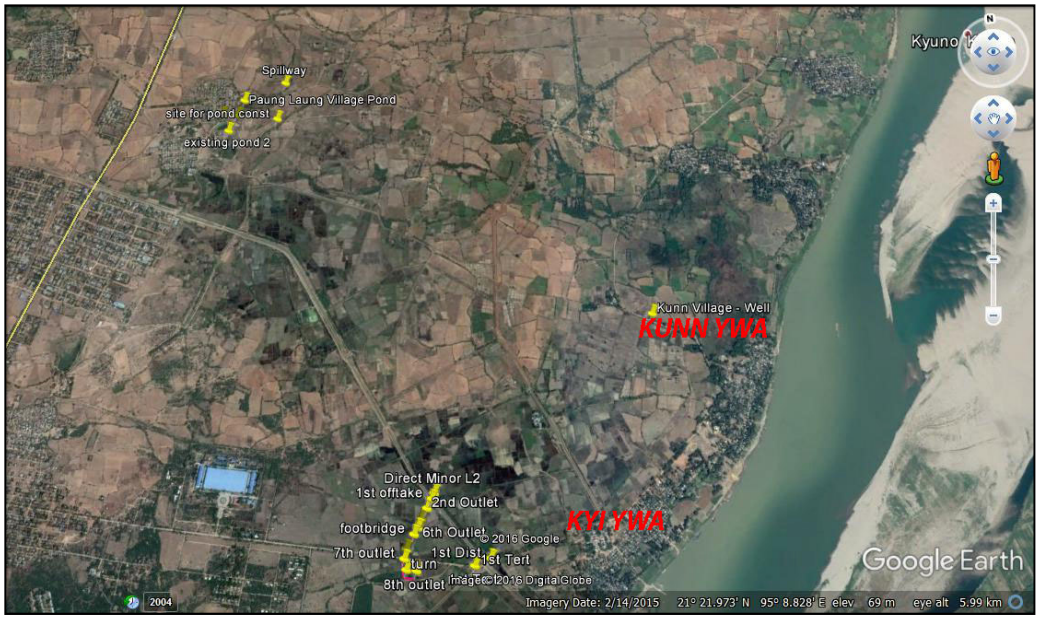
17. From the candidate subproject list, two subprojects have been identified as “core” subprojects.

18. **Pakokku Climate Smart Water Management**. This subproject comprises renovation of 2000 feet of the DML2 minor canal at Kyi Ywa Pumping Station in Shwe Tan Thit Village. The subproject objective is to increase the productivity of certified HYV rice seed and HYV paddy during the monsoon season, and of certified seed and marketable grains of pulses, beans, and sesame during the winter and summer seasons. The production of a significant quantity of certified seed and marketable grain of climate-resilient rice, pulses, beans, and sesame from the Subproject Pakokku area will lead to greater use of certified seed, improve productivity, and improve the livelihoods of farmers.

19. As illustrated in the satellite image (Figure 2), the two village sites for this subproject are north east of Pakokku Town.

20. The main activity includes renovation of Tertiary Canal, (Kyi Ywa, Shwe tan dit Village), comprises rehabilitating and modernizing critical infrastructure of small scale irrigation systems to increase production and reduce post-harvest losses.

Figure 2. Satellite Image with Site Plan of Proposed Activities



21. **Chepa Seed Farm Subproject**. This subproject, in Shwebo, comprises the rehabilitation of irrigation canals, farm roads, and rehabilitation and/or construction of buildings for seed storage, seed laboratory, machinery, and training. New machinery and equipment will also be purchased, as well as the installation of a meteorological weather station, and a perimeter fence. With improved infrastructure, the Chepa Seed Farm will be able to increase their productivity and their production of registered seed of rice, pulses, beans, and sesame. This will lead to a greater distribution of registered seed to an estimated 1197 private seed growers each year, an increased supply of certified seed from the private seed growers to farmers, increased yields of these crops, and, taken together with the associated initiatives, an increased supply of export quality products.

22. The Chepa Seed Farm is 82 total acres and has 70 acres of cultivated area with perennial irrigation, no water shortage in any season, from the Kar Bo Dam Irrigation Project. (See Figure below) The irrigation canals are earthen, leak heavily, and have been incurring high maintenance costs. There are no intakes and related structures in the irrigation system. The irrigation canals need to be rehabilitated with proper PCC lining, intakes and outlet structures, cross drainage structures, and checks.

Figure 3. Chepa Seed Farm Canals and Drains.

II. ASSESSMENT OF LEGAL FRAMEWORK AND INSTITUTIONAL CAPACITY

A. ADB Environmental Assessment Requirements

23. An EARF is required for all sector investments with potential environmental impacts. This EARF identifies the broad scope of the project and outlines the policy, procedures and institutional requirements for preparing subprojects under the project. This EARF will guide subproject screening and categorization, environmental assessment, and preparation and implementation of safeguard plans to facilitate compliance with ADB SPS (2009).

24. Each proposed subproject will be assigned to one of the following categories depending on the significance of the potential environmental impacts and risks:

(i) **Category A:** Proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works.

(ii) **Category B:** Proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects.

(iii) **Category C:** Proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. An EIA or initial environmental examination (IEE) is not required, although environmental implications need to be reviewed.

25. It is anticipated that a number of the candidate subprojects implemented under the loan will be classified as environment category C as they are considered to have “minimal or no adverse environmental impacts”.

26. A number of subprojects implemented will be classified under ADB guidelines/rules as Category B. For these subprojects an IEE is required to determine whether or not significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.

27. **Climate Risk.** All ADB projects are screened for climate risks. A detailed climate risk and vulnerability assessment is carried out for projects identified to be at medium or high risk from climate change impacts. The assessment aims to quantify risks and identify adaptation options that can be integrated into the project design.

B. Myanmar Environmental Assessment Requirements

28. The EIA Procedure Notification was enacted on 29 December 2015. The main objectives of this sub-decree are to:

(i) determine an EIA upon every private and public project or activity; it must be reviewed by the ECD of the Ministry of Natural Resources and Environmental Conservation (MONREC) (formerly Ministry of Environmental Conservation and Forestry), prior to the submission for a decision from the government;

(ii) determine the type and size of the proposed project(s) and activities, including existing and ongoing activities in both private and public sector prior to undertaking the process of EIA; and
(iii) encourage public participation in the implementation of the EIA process and take into account their conceptual input and suggestions for re-consideration prior to the implementation of any project.

29. An annex of the sub-decree lists the activities and the scale of activity which require an environmental assessment. An excerpt from this annex, covering activities related to project implementation, is included below as Table 1.

Table 1: List of Projects Requiring IEE and EIA

Type and activities of the projects	IEE, Size / Capacity	EIA, Size / Capacity
AGRICULTURE		
Crop, agro-industrial crop (rubber, palm oil, cocoa, coffee, tea, banana, sugarcane, etc.)	Between 200 - 500 ha	≥ 500 ha
Seasonal Crop (cereals, pulses, roots, tubers, oil-bearing crops, fibre crops, vegetables and fodder crops)	Between 500 - 3000 ha	≥ 3,000 ha
Irrigation Systems	Between 100 – 5000 ha	≥ 5,000 ha
Pump irrigation	< 4,500 m3/ day	≥ 4,500 m3/ day
Vegetable Oil Production and Processing Facilities	≥ 100 t/d but < 300 t/d product and < 600 t/d if production is operating a maximum of 90 d/a	≥ 300 t/d product or ≥ 600 t/d if production is operating a maximum of 90 d/a
INFRASTRUCTURE AND SERVICE DEVELOPMENT		
Dam for irrigation	Ht of dam < 15m, catchment area <400 ha	Ht of dam ≥ 15m, catchment area ≥ 400 ha
Dredging work	< 500,000 tons	≥ 500,000 tons
Road upgrading work (seasonal road to all weather road)	≥ 50 km	As determined by MONREC

EIA = environmental impact assessment, ha = hectare, IEE = initial environmental examination, MONREC = Ministry of Natural Resources and Environmental Conservation
Source: EIA Procedure Notification of Government of Myanmar (2015).

C. International Conventions on Environment

30. International conventions and agreements to which Myanmar is a signatory along with the date of signing by Myanmar include:

(i) Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC), 23 February 2005;
(ii) Montreal Protocol on Substances that Deplete the Ozone Layer, 1 January 1989;
(iii) UNFCC, 21 March 1994;
(iv) UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage, 1985;

(v) Plant Protection agreement for the South-East Asia and the Pacific Region, Rome, 1956 (1959);
(vi) Treaty Banning Nuclear Weapons Test in the Atmosphere in Outer Space and Under Water, Moscow, 1963;
(vii) Treaty on the Prohibition of the Emplacement of Nuclear Weapons and other weapons of Mass Destruction on the Sea-Bed and Ocean Floor and in the Subsoil thereof, London, Moscow, Washington, 1971;
(viii) Convention of the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons, and on their Destruction, London, Moscow, Washington, 1972;
(ix) International Convention for the Prevention of Pollution from Ships, London, 1973;
(x) Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships, London, 1988;
(xi) United Nations Convention on the Law of the Sea, Montego Bay, 1982 (1996);
(xii) Convention on Biological Diversity, Rio de Janeiro, 1992 (1994);
(xiii) Treaty on the Non-Proliferation of Nuclear Weapons, London, Moscow, Washington, 1968 (1992);
(xiv) Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and their destruction, Paris, 1993;
(xv) International Tropical Timber Agreement (ITTA), Geneva, 1994 (1996);
(xvi) Vienna Convention for the Protection of the Ozone Layer, Vienna, 1985 (1993);
(xvii) Montreal Protocol on Substances that Deplete Ozone Layer, Vienna, 1985 (1993);
(xviii) ICAO Annex 16: Annex to the Convention on International Civil Aviation Environmental Protection Vol I Aircraft Noise;
(xix) Annex to the Convention on International Civil Aviation Environmental Protection Vol II Aircraft Engine Emission;
(xx) Treaty on Principles of Governing the Activities of States in the Exploration and Use of Outer Space including the Moon and the Other Celestial Bodies (Outer Space Treaty), London, Moscow, Washington, 1967 (1970);
(xxi) Agreement on the Networks of Aquaculture Centres in Asia and the Pacific, Bangkok, 1988 (1990);
(xxii) South East Asia Nuclear Weapon Free zone Treaty, Bangkok, 1995 (1996);
(xxiii) United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and / or Desertification, Particularly in Africa, Paris, 1994 (UNCCD) (1997);
(xxiv) Convention on International Trade in Endangered Species of Wild Fauna and Flora, Washington D.C., 1973, and this Convention as amended in Bonn, Germany 1979 (CITIES) (1997);
(xxv) Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 Dec 1982, NY, 1994 (2006);
(xxvi) Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas, Rome, 1973 (1994);
(xxvii) ASEAN Agreement on the Conservation of Nature and Natural Resources, Kuala Lumpur, 1985 (1997);
(xxviii) Cartagena Protocol on Bio-safety, Cartagena, 2000 (2008);
(xxix) ASEAN Agreement on Transboundary Haze Pollution (1997);

(xxx) International Treaty on Plant Genetic Resources for Food and Agriculture, 2001 (2004);
(xxxi) Declaration on ASEAN Heritage Parks (2003);
(xxxii) Stockholm Convention on Persistent Organic Pollutants (POPs), 2001 (2004);
(xxxiii) The Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat, 1971 as amended in 1982 and 1987 (2004);
(xxxiv) Establishment of ASEAN Regional Centre for Biodiversity (2005);
(xxxv) Copenhagen Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, Copenhagen, 1992 (2009);
(xxxvi) International Tropical Timber Agreement (ITTA), Geneva, 2006 (2011);
(xxxvii) Montreal Amendment, 1997 and Beijing Amendment, 199 to the Montreal Protocol on Substances that Deplete Ozone Layer, 1997 (2012); and
(xxxviii) Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, Basel, 1989 (2015).

D. Complying with Myanmar Government and ADB Requirements

31. The IEE (for Category B subprojects) or review of environmental effects (for Category C subprojects) will be prepared according to ADB SPS (2009) requirements. On a case-by-case basis, the ECD will determine whether the ADB assessment document will also satisfy the EIA Procedure Notification 2015. In most cases, the ADB IEE will satisfy ECD requirements but this will need to be checked for each subproject via submission to the ECD, setting out the project description and the level of ADB assessment that will be prepared.

Table 2: Comparing ADB and Myanmar Categorization Systems

ADB Project Categories	Myanmar Categorization
Category A: Projects with potential for significant adverse environmental impacts, requiring an environmental impact assessment (EIA)	**EIA type Project:** Projects with potential for significant adverse environmental impacts and large scale, an example Hydro Power Project, chemical industrial project etc, requiring an EIA.
Category B: Projects judged to have some adverse environmental impacts, but of lower degree and/or less significant than those for category A projects. Category B projects require an initial environmental examination (IEE)	**IEE Type Project**: Projects judged to have some adverse environmental impacts or medium or small scale project, requiring an IEE.
Category C: Projects unlikely to have adverse environmental impacts. No special requirement, but environmental aspects are reviewed as well.	**The EIA Procedure Notification (2015):** For projects not requiring an IEE or EIA, environmental aspects are reviewed and a stand-alone EMP may be required as is the current approach in the Environmental Conservation Department, MONREC

E. Adequacy of Legal Framework

32. While the Myanmar laws can be seen to be far reaching since its establishment in 2012, a number of regional ECD offices have indicated that they do not have the resources to ensure widespread compliance. While this situation is not unique, this EARF within which the project will operate aims to ensure compliance with both Myanmar and ADB standards. In addition to the Government of Myanmar's National Environment Policy (1994), the Protection of Wildlife and Natural Areas Conservation Law (1994), the Conservation of Water Resources and River

Law (2006) and the Environmental Conservation Law, 2012, the Environmental Conservation Rules (2014), the EIA Procedure Notification 2015, and the Environmental Emission Guidelines 2015 has been enacted and active; and are being duly adhered to as standing legal framework in Myanmar. During the past few years, development partners (e.g., JICA and ADB) have invested in the environmental conservation sector for Myanmar's institutional strengthening in adequacy of its legal framework. Significant empowerment has been administered in preparing Technical Guidelines for EIA Review, Monitoring and Compliance, EIA Guidelines for Hydropower Sector, Transitional Consultant Registration, Environmental Quality Management Trainings, Technical Assistance Capacity Development in Basic Water Environment Management and EIA Systems in Myanmar, EIA Framework, Pollution Control Management, Environmental Institutional Strengthening and other relevant capacity building projects and the expansion and strengthening of regional ECD staff offices in the urban and rural areas of Myanmar.[7]

III. ANTICIPATED ENVIRONMENTAL IMPACTS

A. Potential Impacts

33. Environmental assessment will consider all potential impacts and risks on physical, biological, socioeconomic (occupational health and safety, community health and safety, vulnerable groups and gender issues), and impacts on livelihoods through environmental media and physical cultural resources in an integrated way.

34. The anticipated environmental impacts and mitigation measures for all candidate subproject activities are provided below in Tables 5, 6 and 7. These are indicative impacts, and will need to be further explored during the detailed design stage.

35. Initial screening during the PPTA has identified that the candidate subprojects only include minor civil works with minimal environmental impacts which are primarily related to location and construction impacts. Potentially, none of the activities associated with the representative core subprojects have been assessed as having significant adverse environmental impacts and for the most part provide an opportunity to introduce building and construction standards which enhance environmental resilience. The environmental screening criteria (Table 3) have been developed to avoid significant environmental impacts during subproject site selection. Careful site selection and engineering design of subproject components, coupled with clearly defined construction, operation and maintenance procedures can avoid and reduce environmental impacts to a minimal level.

36. The REA checklists completed for the representative core subprojects provided guidance on the common types of environmental impacts to be expected for the construction and operation phases, and also flagged potential environmental issues. Project activities associated with Output 1 will include:

i. improving the infrastructure (irrigation, drainage, buildings, farm and post-harvest machinery and equipment, seed testing equipment, etc.) of ten DOA Seed Farms in the CDZ;
ii. renovating at least 130km of minor irrigation canals, 15 community-owned small reservoirs, and installation of 8000 shallow tube wells, with some of them linked

[7] Government of Myanmar, Environmental Conservation Department, MONREC. 2016. *Update on EIA/SIA: Consultation Meeting between Environmental Sector Working Group and Development Partners.* Nay Pyi Taw.

to drip and sprinkler technologies, and small-scale pumping; and the rehabilitation of at least 300 km of farm feeder roads to climate resilient condition; and

iii. enhancing the testing capability by upgrading the equipment and instrumentation of the Plant Protection Division's Pesticide Testing Laboratory and its Food Safety Testing Laboratory and of the MOC's Commodity Testing and Quality Management Laboratory

37. Subprojects will only be sustainable if they are well-managed and maintained. This requires appropriate specification and use of good quality and durable materials, good quality construction and development of local capacity and skills for maintenance.

B. Pre-construction

38. Consideration at planning and design stages can avoid or minimize potential environmental impacts. This includes attention to specification detail which aims to incorporate climate change resilience to potential increase in winds, storm events and flooding as well as use where appropriate of renewable and alternative energy systems. Table 5 highlights potential impacts and mitigation, grouped by the three main types of interventions proposed: (i) building construction and upgrade; (ii) irrigation canal upgrade and climate smart water management; and (iii) access road upgrade.

Table 3: Indicative Impacts - Design and Planning

Potential Impacts	Building construction & upgrading	Irrigation canal upgrade and climate smart water management	Access roads upgrade
Sustainability	Any activity will need to be considered sustainable such that provides benefits and services without compromising physical nor social resource quality.		
Climate Condition & change	Planning and design will take into consideration mitigation against possible extreme weather related events such as floods, droughts, storms and landslides.		
	Design will specifically aim to incorporate resilience against anticipated climate change impacts.		
Site Location	Upgrade within existing footprint. Orientate buildings to maximize opportunities for natural ventilation.	Use existing alignments to minimize impacts.	
Biodiversity	New buildings, road upgrades or irrigation canal enhancements can be adjacent to forest or regrowth shrub land and provide habitat for local wildlife populations. Areas not previously farmed or long abandoned may be involved where an irrigation command area is increased as a result of a renovated irrigation scheme. Subproject selection criteria have ensured that no critical or important natural habitats will be involved, however local biodiversity may need to be considered and the retention of linked refuge vegetation and corridors should be included where local biodiversity is recorded.		
Conversion of Land Use	Design minimizes footprint and clearance of vegetation, agricultural land and trees of conservation/cultural value.		
Air Pollution and Water Supply	Buildings, roads construction and irrigation canal works may involve potentially polluting agents and care is required to ensure soil and water resources are not compromised. The quality and quantity of localized water supply, as well as access by FGs, will not be negatively impacted by activities. On-site prevention and		

Potential Impacts	Building construction & upgrading	Irrigation canal upgrade and climate smart water management	Access roads upgrade
	abatement procedures will be established by contractors where required.		
Water Supply		The cumulative impact of renovating 130 kilometres of minor canals, installing 8000 tube wells, and rehabilitating 15 small reservoirs needs to be assessed.	
Water Supply Balance		Maintaining water supply is an integral part of water and agricultural planning within irrigation command areas. Water management should be prepared using local data for inflow, infiltration, runoff coefficients, crop water demands and agricultural calendars. Liaison with Water User Groups (WUGs) is critical for such activities.	
Increased storm water run-off as a result of climate change	Ensure buildings include adequate drainage provisions and any cut slopes are stabilized prior to completion.	Ensure canal banks are stabilized to minimize erosion and run-off.	Ensure road embankments and cuttings are reinforced to minimize erosion and run-off, drainage specifications are adequate and will not have a negative impact on localized flooding impacts.
Minimize greenhouse gas emissions	Specify energy and water efficient fixtures, fittings and equipment. Specify materials with good insulating and reflective properties for building envelope to minimize energy requirements.	Ensure design and specification maximize durability.	Ensure specified road surface and drainage is appropriate for volume of traffic and rainfall to ensure durability.
Increased vehicular traffic	Ensure planning to provide for safe access and egress.	N/A	Ensure selected road surface appropriate for volume of traffic and budget and resources available for periodic maintenance.
Waste	Planning and design can focus upon the management of waste during construction, to avoid or minimize hazardous and nonhazardous waste, and to specify treatment and/or disposal of in an environmentally sound manner.		
Need for borrow-pits	N/A	N/A	Where possible, the design should optimize cut and fill balance and plan for reuse of spoil by

Potential Impacts	Building construction & upgrading	Irrigation canal upgrade and climate smart water management	Access roads upgrade
			the local community or adjacent construction sites to minimize disposal. Any topsoil should be stored and reinstated after completion.
Grievances	Ensure public disclosure of subproject information and that affected persons are given the opportunity to provide feedback during the design process.		

C. Construction Impacts

39. During construction activities for buildings, access roads, bridges, canals and other irrigation infrastructure, the main issues will be a potential for soil, air and water pollution and soil erosion, all of which must be managed by strict control of construction contractors. Additional localized traffic congestion should also be anticipated and this must be minimized by responsible transport planning. Health and safety of the community and construction workers is also a primary concern.

40. Mitigation of construction-phase impacts relies heavily on the responsibility of works contractors to follow specification clauses in contracts designed to minimize pollution of air and water and soil erosion. This mitigation will in turn rely on oversight by the ESO in the PMU and also by the PIC.

Table 4: Indicative Impacts - Construction

Generic– relevant to all subprojects	
Anticipated Environmental Impacts	**Mitigation Measures**
Occupational health and safety	Appoint an Environmental Health and Safety Officer to carry out daily site management checks and to provide training for construction workforce. Provide appropriate personal protective equipment for workers.
Community health and safety	Ensure access to active construction sites and movement of construction heavy equipment is controlled.
Loss of trees and vegetation	Ensure construction working area is clearly demarcated and trees/vegetation protected from damage. Permits and compensation may be required for removal of certain tree species.
Disruption to businesses and communities	Prepare and implement traffic management plans in coordination with local authorities. Conduct public consultation prior to and during construction and ensure information is provided in advance on noisy and/or disturbing activities.
Construction activities could potentially negatively intersect with the annual farming calendar.	Farmers will benefit from consultation on planned schedules for construction including to mitigate loss of irrigation water, road access etc.
Building, road and irrigation upgrades and construction	
Building / Construction *(e.g. Seed farm processing buildings, roads, canals)*	**Mitigation Measures**

Generic– relevant to all subprojects	
Anticipated Environmental Impacts	**Mitigation Measures**
Impact on topography and slope stability	Construction activities should avoid steep slopes, landslide and erosion prone areas.
Management of spoil and materials	Cover material and spoil stockpiles and during transport
Siltation of irrigation channels and water resources	Appropriate cut off and cross drains should be installed to avoid run-off to irrigation canals and watercourses.
Dust generation and dispersal	Carry out regular spraying of haul routes and active construction
Roads construction and upgrading can contribute to erosion.	During construction, contractor to minimize potential for erosion through application of procedures to mitigate and minimize erosion.
Excavation may generate excess spoil	Find beneficial uses for spoil in construction or local infill to avoid the need for disposal
Damage to utility infrastructure	Confirm location of existing utilities and any need for temporary disruption.
Irrigation	**Mitigation Measures**
Impacts on water quality and agricultural productivity	Control works and ensure effective site management and clean-up on completion.

D. Operation Phase Impacts

41. Subprojects will only be sustainable if they are well-managed and maintained, this requires development of local capacity and skills for maintenance.

42. **Operation and protection of water source.** The management of these sources should be included as part of the operational environmental protection measures. This will include watershed protection, pollution control, protection of any local fisheries and maintenance of local beneficial users (direct irrigators, subsistence gardens.).

43. **Loss of terrestrial vegetation and habitat.** New areas not previously farmed or long abandoned, which come into the command area with the renovated irrigation scheme may have regrowth shrub land or forest and provide habitat for local wildlife populations. Subproject selection criteria have ensured that no critical or important natural habitats will be involved, however local biodiversity may need to be considered and the retention of linked refuge vegetation and corridors should be included where local biodiversity is recorded. Water User Groups (WUGs) should be involved in subproject selection processes.

Table 5: Indicative Impacts - Operation

Generic– relevant to all subprojects	
Anticipated Environmental Impacts	**Mitigation Measures**
Operational Maintenance	Sufficient training to all technical staff provided to manage, operate and maintain infrastructure and operations at a high standard at handover.
Occupational health and safety	Ensure training for operational workforce in key environmental health and safety issues; machinery noise, protection and prevention of accidents. Provide appropriate personal protective equipment for workers.

Generic– relevant to all subprojects	
Anticipated Environmental Impacts	**Mitigation Measures**
Recycling, Energy Efficiency.	Information, Education and communication program on aspects of recycling and energy efficiency incorporated into handover schedule.
Integrated management of farming inputs; fertilizers, herbicides and pesticides	Capacity building and training to reinforce efficient and responsible use of farming inputs to link with national integrated pest management program.
Effects of extreme weather events.	A training program to promote township/village based disaster risk management at handover.
Seeds and Pulses processing	
Increased localized concentrations of processing in one place leads to increased waste	Organic waste from processing requires (i) management and consideration of recycling opportunities post-processing and (ii) care in transportation from site to minimize any potential negative impacts.
Irrigation	
An increase in rice paddy areas may result in increased greenhouse gas emissions.	Greenhouse gas emissions should be calculated and assessed for significance at handover.
Water pollution	Ongoing monitoring of surface water to identify and resolve impacts on downstream water bodies.
Siltation of irrigation channels and water resources	Routine maintenance of channels is required by Water User Groups (WUGs).
Knock-on impacts of increased agricultural production due to improved water availability – on soil and water (including groundwater) quality due to increased use of fertilizers and pesticides.	WUGs and individual farmer groups offered training on improved agronomic practices including correct application of fertilizers and pesticides, so as to mitigate any negative impact.

IV. ENVIRONMENTAL ASSESSMENTAND REVIEW OF SUBPROJECTS

A. Subproject Selection Environmental Criteria

1. General Exclusion Criteria

44. The following subprojects will not be eligible for funding under the project:

i. Subprojects including activities listed on the Prohibited Investment Activities List in Appendix 5 of SPS; or
ii. Subprojects that do not comply with national environment, health and safety laws and regulations; or
iii. Subprojects that have potential to cause significant irreversible, diverse or unprecedented adverse environmental impacts (Category A under ADB SPS (2009)).

2. Environmental Criteria

45. Potentially eligible subprojects will be subjected to the following subproject selection criteria related to environment safeguards prior to selection:

i. No subprojects that have the potential to directly or indirectly result in conversion or degradation of natural habitat (e.g., primary forests or wetlands) will be included

ii. No subprojects that fall in part or in whole within a legally protected area, an area supporting high biodiversity value or qualifying as critical habitat will be included

iii. No subprojects that utilize water from or discharge to a water body in a legally protected area, an area supporting high biodiversity value or qualifying as critical habitat will be included

iv. Subprojects that are within natural habitat or in proximity to surface water bodies will have minimal or no operational impacts

v. Subprojects that are within proximity to residential or other sensitive human receptors will have minimal or no operational impacts

vi. No subprojects where the structural failure of infrastructure may threaten the safety of local communities will be included

vii. No subprojects that have the potential to directly or indirectly result in permanent damage to physical cultural resources of national or international importance will be included

viii. No subprojects that will result in removal of any physical cultural resources or lead to destruction/disturbance to historical and cultural places/values will be included;

ix. No subproject will be undertaken in areas where soil contamination requiring remediation exists;

x. No subprojects will be undertaken unless it will have sustainable water supply and will not utilize water of very poor quality, as evidenced by the presence of high levels of pollution;

xi. No subprojects will be undertaken where there are water use conflicts or other water security issues;

xii. No subprojects will be undertaken if they require works in sensitive archaeological areas or recognized national, provincial and district monuments of cultural or historical importance

xiii. No subprojects that not bring about significant change in land use from residential and/or institutional to commercial and/or transport and/or industrial in the vicinity of the subproject site will be included

B. Environmental Screening of Subprojects

46. At the subproject selection stage, all potential subprojects shall be screened and assigned a category in accordance with Myanmar Environmental Assessment Procedure (2015) and the ADB SPS (2009). Relevant categories are:

Myanmar Environmental Impact Assessment Procedure (2015)	ADB SPS 2009
EIA Type Project	Category A – requires EIA
IEE Type Project	Category B – requires IEE
Neither an EIA nor an IEE Type Project and therefore may not be required to undertake any environmental assessment.	Category C - no environmental assessment is required although environmental implications need to be reviewed

In practice, a standalone Environmental Management Plan may be required.	For CFAVC Project, Environmental Codes of Practice will be prepared

47. Subprojects will be screened using the Environmental Screening Checklist (Appendix 1).

48. Candidate subprojects with potential for significant adverse impacts and requiring an environmental impact assessment (EIA) (i.e., Category A) will be rejected.

49. Candidate subprojects requiring an initial environmental examination (IEE), will prepare the IEE in accordance with Myanmar Environmental Impact Assessment Procedure (2015) and the ADB SPS (2009).

50. Candidate subprojects requiring no further environmental assessment (Category C) will follow the Environmental Codes of Practice (Appendix 2).

51. A Climate Risk Assessment and Management document for the project has been prepared during project preparation stage, and the impact assessment of all subprojects will need to take account of its findings.

C. Procedures for Environment Category B Subprojects

52. The process shall initially involve a scoping exercise. Scoping is a planning exercise to determine the content and emphasis (level of detail) for the assessment. Scoping quickly assesses the existing environmental context of the project area, the likely environmental impacts, and determines the methodology of assessment and required expertise.

53. **Assessment Methods.** The IEE assessment should include the following steps:

(i) **Desk Study:** Review available information such as maps, reports, feasibility and design reports for the subproject and site. Identify site information needed to prepare the IEE. The subproject area of influence and assessment area shall be defined and ADB SPS and Myanmar EIA Procedure (2015) requirements referred to and duly followed.

(ii) **Consultation and Information Disclosure:** Carry out focus group discussions with affected persons and local stakeholders, including government and non-government agencies on the proposed subproject. MONREC should be consulted to confirm if there are any domestic environmental approval requirements. Other government approvals required for specific subproject activities, e.g. tree-cutting, increase in water intake should also be confirmed. Following completion of project preparation, affected persons and stakeholders should be made aware of the final details of the subproject and how their feedback was taken into account.

(iii) **Field Assessment:** Field visits shall be carried out to assess environmental baseline conditions and to identify potential impacts and risks to physical, biological, socioeconomic and physical cultural resources in the project's area of influence.

(iv) **Identification of Environmental Impacts and Mitigation Measures:** The impacts will be identified in terms of their significance, extent, reversibility, and duration. Alternative analysis should be carried out for any potentially significant

impacts. Measures should be identified to avoid minimize and/or mitigate adverse impacts and to enhance positive impacts.

(v) **Design of Environmental Management Plan (EMP):** The IEE shall include an EMP which sets out the proposed mitigation measures, monitoring and reporting requirements, institutional arrangements for subproject and EMP implementation, cost estimates and performance indicators. The EMP will contain requirements for the Contractor to prepare a Contractor Environmental Management Plan prior to the start of construction. The EMP will be incorporated into tender documents and construction contracts. A generic EMP matrix is presented in Appendix 3.

54. At project implementation stage, the first IEE (including EMP) of each subproject prepared under this EARF will be submitted to ADB via the PMU for prior review before contracts are awarded for construction. Upon confirmation that the proposed subproject meets ADB SPS (2009) requirements, subsequent IEEs including EMPs can be approved by the PMU Director. The approval is subject to post review by ADB upon request. If the MONREC's approval of the IEE is required, this approval must be obtained before submission of the IEE to ADB (in case of prior review) and before contracts are awarded for construction (in case of post review).

D. Procedures for Environment Category C Subprojects

55. Category C Projects must follow Environmental Codes of Practice. Guidelines for the development of ECOP are included as Appendix 2.

56. Similar to the EMP, the ECOP covers all phases of subproject implementation from preparation through construction and operation, and sets out potential environmental impacts and corresponding environmental protection measures to: (i) avoid, and (ii) where avoidance is not possible, mitigate environmental impacts, and (iii) achieve compliance with national environmental regulations and ADB SPS (2009).

57. The ECOPs will be incorporated into tender documents, construction contracts, and operational management procedures. Contractors, PIC, PMU and regional MOALI office will implement these measures, depending upon subproject phase. The effectiveness of these measures will be carefully monitored to ensure they are effective and to make adjustments, as required.

58. The environmental implications of proposed activities will be reviewed in relation to the types of activities and impacts identified in the ECOP. If there are any unanticipated environmental impacts and risks that are not already covered by the code then additional measures can be added.

V. CONSULTATION, INFORMATION DISCLOSURE AND GRIEVANCE REDRESS MECHANISM

A. Public Consultation

59. The public consultation and participation process during the project preparation stage should involve: (i) reconnaissance surveys of the subproject sites, and (ii) participatory meetings with local stakeholders.

60. Reconnaissance surveys will comprise on-site discussions with relevant government agency officials (regional, district, township) and farmer groups to provide information on the physical and biological resources, social-economic environment, opportunities and constraints relevant to the proposed subproject.

61. Additional participatory meetings with government stakeholders and representatives from farmers groups including rice seed, pulses, water users and access road beneficiaries should also be undertaken to collect data and to present the project (designs and locations), and to ascertain social and environmental issues and concerns.

62. Feedback from the participants on subproject implementation and consensus on how to deal with environmental issues in the area will be important goals of the consultation process.

63. Details of ECOP and IEE / EMP documentation should be clearly delivered during public consultation meetings.

B. Public Disclosure

64. All IEEs, EMPs and environmental monitoring reports must be submitted and disclosed on ADB website. IEEs will also be disclosed on the PMU's website. In the case of some foreign financed projects in Myanmar, a dedicated project website has been developed to offer ongoing news and updates. MOALI has its own website to broadcast information about agriculture and forestry issues. Decision on a dedicated project site will be a welcome addition to raise awareness of progress of project implementation.

C. Grievance Redress Mechanism

65. **Proposed Mechanism**: The PMU will establish a Project Public Complaint Unit (PPCU) which will act as a central recording and coordinating unit in compliance with ADB SPS (2009) requirement to prevent and address community concerns and assist the project to maximize environmental and social benefits. Each subproject PIU will ensure that a Grievance Redress Mechanism (GRM) is publicized locally so that the community is fully aware of the mechanism and the local points of entry to it. The GRM will be set-up to also address land acquisition and resettlement concerns as detailed separately in the land acquisition and resettlement framework. The setting up of the GRM in the PMU and its initial implementation through the PMU and PIUs will be supported by the Environmental Specialist (and social safeguards specialist) of the PIC.

66. The GRM will be accessible to diverse members of the community, including more vulnerable groups such as women and youth. Multiple points of entry, including face-to-face meetings, written complaints, telephone conversations, or e-mail, will be available. Opportunities for confidentiality and privacy for complainants will be honored where this is seen as important.

67. When construction starts, a sign will be erected at each construction site providing the public with updated project information and summarizing the GRM process including details of the GRM entry points. The contact persons for different GRM entry points; PMU, PIU, WUG leaders, contractors, and operators of project facilities, will be identified prior to construction. The contact details for the entry points (e.g. phone numbers, addresses, e-mail addresses, etc.) will be publicly disseminated on information boards at construction sites and on the website of the local government.

68. The preferred action sequence for complaints handling is that the complaint should be investigated and resolved by the unit receiving the complaint. If this is not possible, the complaint should be referred to the PMU (whose wider membership will enable coordinated action in response).

69. The PPCU will maintain records of complaints and actions taken to correct them. This data will be included in the PMU's reports to the ADB. The PPCU will establish a GRM tracking and documentation system. The system will include the following elements: (i) tracking forms and procedures for gathering information from project personnel and complainant(s); (ii) staff to update the database routinely; (iii) systems with the capacity to analyze information so as to recognize grievance patterns, identify any systemic causes of grievances, promote transparency, publicize how complaints are being handled, and periodically evaluate the overall functioning of the mechanism; (iv) processes for informing stakeholders about the status of a case; and (v) procedures to retrieve data for reporting purposes, including the periodic reports to the ADB.

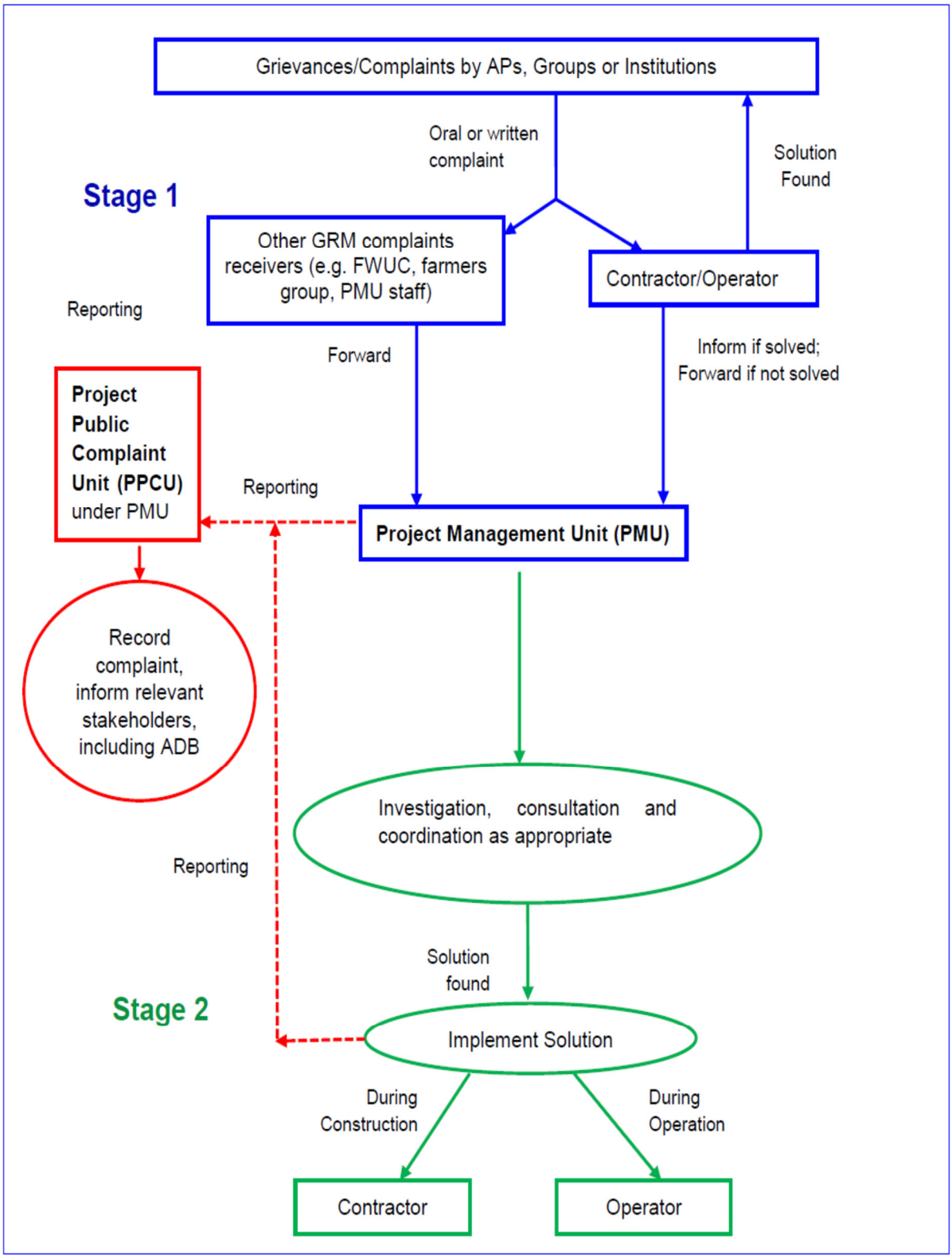
1. GRM Procedure and Timeframe

70. The procedure and timeframe for the grievance redress mechanism are described as follows (see Figure 2). The stages are represented by different colors in the flow diagram:

(i) **Stage 1:** If a concern arises during construction, the affected person will submit a written or oral complaint to the contractor directly. Whenever possible, the contractor will resolve the issue directly with the affected person. The contractor will give a clear reply within one week. If successful, the contractor will inform the PPCU accordingly.

(ii) **Stage 2:** If no appropriate solution can be found, the contractor should forward the complaint to the PMU within five working days. The complainant may also decide to submit a written or oral complaint to the PMU, either directly or via one of the GRM entry points. The PMU will investigate and identify the solution and provide a clear reply for the complainant within five working days. The environment consultants of the PIC will assist the PMU in replying to the affected person. The PMU will timely convey the complaint/grievance and suggested solution to the contractors or operators of facilities. The contractors during construction and the operators during operation will implement the agreed upon redress solution and report the outcome to the PPCU within seven working days.

Figure 2: Grievances Redress Mechanism Procedure



71. To ensure that complaints are dealt with in a timely fashion, the time limits set for referral of complaints and resolution, as stated above, are summarized as follows:

(i) **Stage 1** = a clear reply within one five-day working week
(ii) **Stage 2** = If no solution found, contractor submits to PMU within five working days. The PMU investigates and provides a clear reply for the complainant within five working days. The contractor is then responsible for implementing the identified solution and reporting to the PPCU within seven working days.

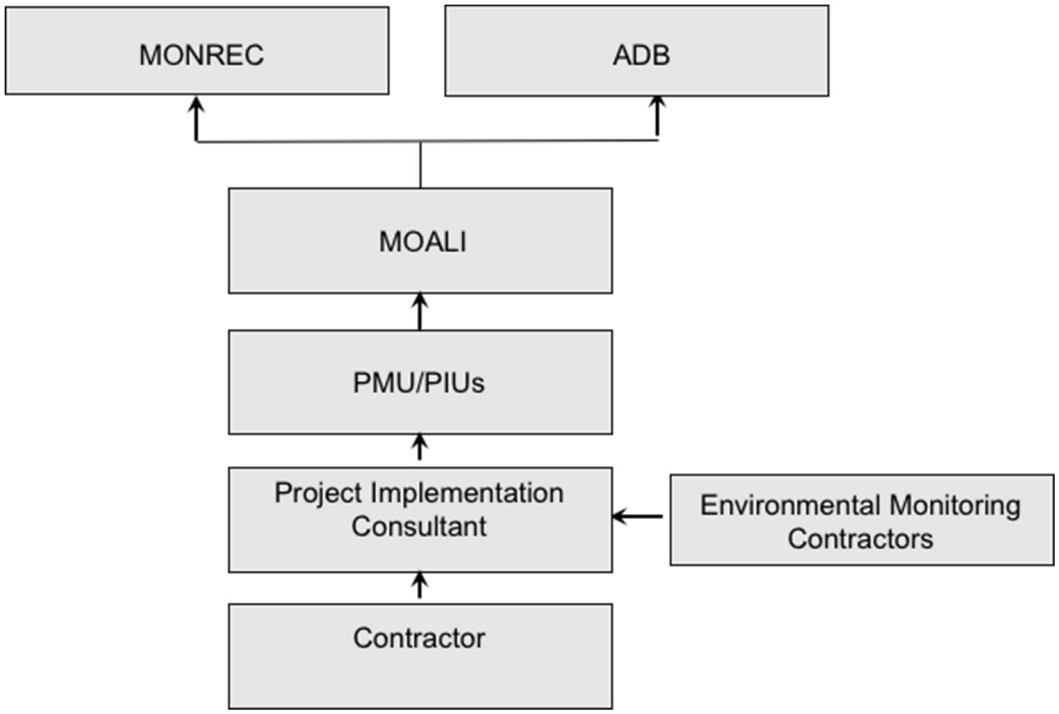
72. The PMU will maintain records of complaints and actions taken to correct them. This data will be included in the PMU's reports to the ADB.

VI. INSTITUTIONAL ARRANGEMENT AND RESPONSIBILITIES

A. Implementation Arrangements

73. The Ministry of Agricultural, Livestock, and Irrigation (MAOLI) does not have environmental and social management systems to: (i) administer the Environmental Assessment and Review Framework; or (ii) supervise, monitor, and report on environmental and social safeguards for the Project. These responsibilities must be undertaken by the Project Management Unit (PMU) for this project.

74. There are seven agencies involved in the implementation, supervision, monitoring and reporting: Contractors, the Project Implementation Consultant, the MOALI Project Management Unit, MOALI, Ministry of Natural Resources, and Environmental Conservation, ADB, and third party Environmental Monitoring Contractors (see reporting relationships below).



75. **Construction Contractors**. Construction Contractors will be responsible for:

i. implementation of the Environmental Management Plan mitigation measures or Codes of Environmental Practices; and
ii. frequent monitoring and reporting on implementation

76. **Project Implementation Consultant (PIC)**. The PIC will be responsible for:

i. Administration of the EARF, preparation of IEEs, and preparation of ECOPs (overseeing the work of the feasibility study and detailed design contractor where delegated to them);
ii. supervision and monitoring of and reporting the contractor implementation of the environmental safeguards for subprojects on behalf of MOALI PMU;

iii. supervision of third party environmental monitoring contractors;
iv. assist MOALI PMU in preparing of the environmental safeguard monitoring reports; and
v. assist MOALI PMU in organization of training and capacity development.

77. **MOALI PMU.** The MOALI PMU will have overall responsibility for:

i. ensuring implementation of all mitigation measures;
ii. ensuring implementation of all monitoring programs;
iii. oversight of supervision and monitoring of subproject implementation
iv. establishment and operation of the Grievance Redress Mechanism;
v. training and capacity development of environmental staff of PMU/PIUs;
vi. meeting all the conditions of the Environmental Compliance Certificate (as issued by MONREC); and
vii. submitting semi-annual Monitoring Reports through MOALI to the MONREC and to ADB.

78. **Project Implementation Agencies**. Implementing agencies will be responsible for conducting monitoring and compliance of environmental and social safeguards, including the gender action plan (based on training and guidance provide by the NPMU and PIC).

79. Ministry of Natural Resources and Environmental Conservation (MONREC). MONREC is responsible for:

i. review of the periodic environmental safeguard monitoring reports submitted by MOALI to ensure that adverse impacts and risks are mitigated as planned;
ii. as necessary, conduct monitoring and inspection of projects to determine compliance with all environmental and social requirements;
iii. as necessary, impose penalties and /or require Project Proponent to undertaken corrective action; and
iv. where Projects are not in compliance or not likely to comply with its environmental and social requirements, take appropriate enforcement actions including: (i) suspension of project operation; and (ii) employing third parties to correct non-compliance.

80. **ADB.** ADB is responsible for:

i. conducting periodic site visits for projects with adverse environmental impacts;
ii. conducting supervision missions for detailed review for projects with significant adverse environmental impacts; and
iii. reviewing the periodic environmental safeguard monitoring reports submitted to ensure that adverse impacts and risks are mitigated as planned.

81. **Independent Third Party Environmental Monitoring Contractors.** Environmental Monitoring Contractors will be responsible for conducting air quality, water quality, noise, and biological environmental monitoring programs on behalf of the MOALI PMU.

1. Environmental Staffing Requirements

82. Environmental staff are needed by the (i) Construction Contractors, (ii) Project Implementation Consultant, and (iii) the MOALI PMU. It is MOALI's responsibility to ensure that qualified and trained staff are hired by all three agencies. MOALI will assign an Environmental

Safeguard Officer to the PMU (see Table 8). The Environmental Safeguards Officer (ESO) will have a detailed understanding of the environmental assessment and resettlement framework (EARF) and relevant laws and regulations and ADB requirements for initial environment examinations (IEEs) and reporting.

83. ESO will:

i. Provide oversight including supervision, monitoring, and reporting on behalf of the PMU, in close collaboration with the international and national environment safeguard specialists;
ii. Coordinate the PIC (and FSDD) activities to implement EARF, prepare IEEs, and prepare ECOPs;
iii. Ensure that the PIC screening activities comply with the selection criteria for environment;
iv. arrange training to provincial departments, farmer water user communities and agricultural cooperative members to facilitate implementation of the EARF;
v. establish and operate the Grievance Redress Mechanism (GRM), and
vi. coordinate preparation of the semi-annual environmental monitoring reports and forward the reports to MOALI for submission to MONREC and ADB.

2. Training and Capacity Development

84. MOALI needs to provide capacity development and/or training programs to ensure staff in all IAs (i) fully understand the environmental management plan; (ii) understand their responsibilities; and (iii) are capable to undertake their responsibilities. As MOALI does not have environmental and social management staff, the PIC will help conduct necessary training and capacity development programs.

3. Independent Third Environmental Monitoring Contractors.

85. Independent Third Party Environmental Monitoring Contractors need to retained to conduct ambient environmental monitoring of air quality, water quality and noise.

Table 8. Indicative Staffing and Outside Consultant Needs

Staff	Position	Level of Effort
MOALI PMU	Environmental Safeguard Officer	Full time during Project
Contractors	Environmental Safeguard Officer	Full time during construction
Project Implementation Consultants	Environmental Supervision Consultant	Six (6) person months
	Environmental Safeguard Specialist(s)	Twenty (20) person months
Outside Consultants to PMU or through the Project Implementation Consultant	Environmental Management Training	$13,500
	Independent Third Party Environmental Monitoring Contractors	$45,400

4. Recommended Reporting Requirements.

86. Monitoring will be through monthly reporting by the Contractor; and quarterly reporting by the PIC. The PIC will draft semi-annual environmental monitoring reports. The PMU will finalize the environmental monitoring reports and MOALI will submit the reports to ECD and ADB (see Table below).

Table 9. Reporting Responsibilities.

Responsibility	Reporting Requirement	Reporting to
Contractor	Monthly inspection and monitoring reports	PIC
Project Implementation Consultants (PIC)	Quarterly inspection and monitoring reports	MOALI PMU
	Draft semi-annual environmental monitoring reports	MOALI PMU
MOALI PMU	Final semi-annual environmental monitoring reports	MOALI
MOALI	Submission of Final semi-annual environmental monitoring reports	ECD, ADB

B. Consultation, Participation and Information Disclosure

87. **Consultation during subproject preparation**. To facilitate a clear understanding of the project activities, as well as the GRM, there is a need for public participation and consultation to be an ongoing process during project preparation and implementation.

88. **Future public consultation plan.** Plans for public involvement during construction and operation stages will have been developed during project preparation. These include public participation in: (i) monitoring impacts and mitigation measures during the construction and operation stages; (ii) evaluating environmental and economic benefits and social impacts; and (iii) interviewing the public after the project is completed. These plans will include several types of public involvement, including site visits, interviews, workshops and investigation of specific issues (Table 10). The assumptions in Table 10 are that the PMU can access the regional and district partner offices responsible, and that considering the anticipated phased implementation, follow up consultation and project information will be iterated where necessary or requested.

Table 10: Public Consultation Plan

Organiz	Format	No. of Times	Subject	Attendees	Budget
Construction Stage for ECOP Cat C & IEE / EMP activities					
PIC/PMU	Public consultation & site visit	once before construction and once each year during construction	Adjusting of mitigation measures, if necessary; construction impact; feedback and suggestions	Residents adjacent to components, village / group representatives	$5,000
PIC/ PMU	Workshop/ press conference	As needed based on public consultation	Feedback / suggestions on mitigation measures, public opinions	Experts of various sectors, media	$2,000
Operational Stage as required Cat C & Cat B					
PIC	Public	Once at project	Effectiveness of mitigation	Residents	$1,500

Organiz	Format	No. of Times	Subject	Attendees	Budget
O&M Units	consultation and site visits	handover	measures, impacts of operation and maintenance feedback and suggestions.	adjacent to component sites, social sectors	
				Total budget:	**$8,500**

O&M = operation and maintenance, PIC = project management implementation consultants, PMU = project management unit – takes an oversight role.

C. Institutional Capacity Building and Training

89. The capacity of PMU, implementing agencies and contractors' staff responsible for implementation and supervision of any IEE or ECOP will be strengthened. All parties involved in implementing and supervising IEEs or the ECOPs must have an understanding of the goals, methods, and practices of project environmental management. The project will address the lack of capacity and expertise in environmental management through institutional capacity building and training.

90. The PIC international and national environmental consultants will provide advice and guidance and conduct capacity building on environmental management and monitoring, as required.[8] A training and capacity development program (Table 11) outlines indicative costs for overall project Institutional Capacity Building and Training which will include adoption of the ECOPs, completion of IEEs for category B projects, the GRM, the implementation of the monitoring plan as well as the routine reporting requirements for all environmental monitoring.

Table 11: Training and Capacity Development Plan

Training	Attendees	Contents	Times	Period (days)	No. of persons	Cost ($/ person /day)	Total Cost
EMP implementation	PMU, IAs, contractors	Development and adjustment of the EMP, roles and responsibilities, monitoring, supervision and reporting procedures, review of experience (after 12 months)	Twice - Once prior to, and once after the first year of project implementation	2	20	100	$4,000
ECOP Implementation	PMU, IAs, contractors	Development and adjustment of the ECOP, roles and responsibilities, monitoring, supervision and reporting procedures, review of experience (after 12 months)	Twice - Once prior to, and once after the first year of project implementation	2	20	100	$4,000

[8] PIC International Environmental Consultants may benefit from and/or require training to get up to speed with Myanmar's EIA Procedure (2015).

Training	Attendees	Contents	Times	Period (days)	No. of persons	Cost ($/ person /day)	Total Cost
Grievance Redress Mechanism	PMU, IAs, contractors	Roles and responsibilities, Procedures, review of experience (after 12 months)	Twice - Once prior to, and once after the first year of project implementation	1	15	100	$1,500
Environmental protection	PMU, IAs, contractors	Pollution control on construction sites (air, noise, wastewater, solid waste)	Once (during project implementation)	2	15	100	$3,000
Environmental monitoring	PMU, IAs, contractors	Monitoring methods, data collection and processing, reporting systems	Once (at beginning of project construction)	1	10	100	$1,000
						Total estimated cost:	**$13,500**

ECOP = Environmental Code of Practice, EMP = Environmental Management Plan, IA = Implementing Agency, PMU = Project Management Unit.

D. Environmental Quality Monitoring

91. The recommended environmental quality monitoring plan is presented in Table 12. Monitoring will be need during pre-construction, construction, and operation phases. An indicative amount of $45,400 has been allocated for environmental quality monitoring.

E. Total Costs for EARF Implementation and Environmental Supervision

92. The estimated total cost for EARF Implementation is $270,400 (Table 13).

Table 13. Summary for Costs for EARF Implementation

1. Consultants			
a. Remuneration, Per Diem, Travel	Months	Cost/Month	
International Consultants	6	20,500	123,000
National Consultants	20	4,000	80,000
2. Training and Capacity Development			13,500
3 Environment Quality Monitoring			45,400
4. Public Consultation			8,500
		TOTAL	$ 270,400

Table12: Environmental Quality Monitoring Plan

Parameters	Location	Frequency	Costs	Responsibilities
Pre-Construction				
Planning for design as well as implementation will include monitoring to ensure that all sites buildings, irrigation upgrading, access road construction, are managed in a systematic manner and good site management practices as set out in the ECOP are implemented.	For example, as per the intentions behind the ECOP, planning and design documentation will emphasize the value of top soils, along with the need to manage site waste and to maintain a clean and safe site which can be verified through successful monitoring.	Specific planning and design documentation for activities will reinforce the ECOP.	Specified in contract documents.	PIC to inspect.
Existing on-site vegetation	All on-site vegetation designated for protection and inclusion in the finished site should be identified. (Some sites may have none).	Once at the pre- construction period.	One day including logistics	National Nominated Officer to visit site
Surface water quality: pH, SS, EC, NH4+, NO3- , PO4 3-, DO, BOD5, COD, Oil& Grease, Coliform	At main canal headworks to establish baseline water quality for surface water entering main canal	Twice: once at beginning of construction period, and once at beginning of wet season irrigation period	A unit cost of $420 per suite of tests.	PIC
During Construction				
Dust and noise	Site inspection of all subproject sites	Quarterly	A unit cost of one day monitoring including logistics	PIC to supervise
Surface water quality: pH, SS, EC, NH4+, NO3- , PO4 3-, DO, BOD5, COD, Oil& Grease, Coliform	Canal waters 100m downstream of major construction sites.	Quarterly	A unit cost of $420 per suite of tests	PIC

Parameters	Location	Frequency	Costs	Responsibilities
Silt and dredge spoil: Organic matter, Zn, Cu, Pb, Hg, As, Cd moisture content, phenols, mineral oil.	Canal silt cleared from waterway. Three sampling locations - at start, midpoint and end of irrigation canals.	Once at each location to check disposal/reuse safety.	Logistics to move spoil -	PIC
Operation Phase				
Surface water quality: pH, SS, EC, NH4+, NO3- , PO4 3-, DO, BOD5, COD, Oil& Grease, Coliform	Canal waters at start, midpoint and end of main canal.	Semi-annual	A unit cost of $420 per suite of tests.	IWRUMD to contract an organization to do sampling and testing.A TOR for independent water sampling is included in Annex III.
Groundwater quality: “Priority Parameters”: pH, Turbidity, Arsenic, Iron, TDS, Pesticides, coliforms.	Household wells located within each of the water user community areas.	Semi-annual	PMU to contract an organization to do sampling and testing	IWRUMD to contract an organization to complete sampling and testing

ECOP = environmental code of practice, IWRUMD = Irrigation and Water Resources Utilization Management Department, PIC = project management implementation consultants, PMU = project management unit, TOR = terms of reference.

VII. CONCLUSION

93. Under the ADB Safeguard Policy (2009), the Project has been classified as Category B, requiring an IEE. Categorization under the Myanmar EIA Procedure (2015) is ongoing with the expectation that the project by categorized as an IEE type project.

94. The environmental assessment has been prepared in accordance with requirements of the Safeguard Policy and the EIA Procedure Public consultation was undertaken and a grievance redress mechanism has been designed to address issues and complaints that may arise during implementation.

95. Through climate-adapted infrastructure and livelihood improvement, the project is expected to achieve significant benefits including improved climate resilience and increased crop diversity. As this is a sector project, an environmental assessment and review framework (EARF) has been prepared to ensure that all subprojects avoid and/or mitigate adverse environmental impacts. All subprojects will undergo environmental screening. Subproject selection criteria have been formulated to avoid significant adverse environmental impacts. Subprojects that have potential to cause significant irreversible, diverse or unprecedented adverse environmental impacts (Category A under ADB SPS) are not eligible for funding. Subprojects will be categorized either B or C. For category B projects, initial environmental examinations and environmental management plans (EMPs) will be prepared. For Category C projects, an Environmental Code of Practice (ECOP) has been developed. All EMPs and ECOPs will incorporated in bidding documents and contract documents to be implemented by contractors.

96. Implementation of the EARF and environmental supervision, compliance monitoring of subprojects, and reporting will be conducted by the environmental staff in the MOALI Project Management Unit with strong support from environmental specialists of the Project Implementation Consultant. Necessary human and financial resources have been allocated for these activities. Assuming that these environmental safeguard measures are effectively implemented, the Project is not expected to have a significant adverse environmental impact.

SUBPROJECT ENVIRONMENTAL SCREENING FORM

INSTRUCTIONS: This checklist is to be completed to support the environmental categorization of subprojects.

Subproject Name:	
Location:	
Date:	
Person Preparing the Screening Form:	
Signature	

Screening Category

Complete Part 1, Part 2, and Part 3 below to support the assignment of screening category

Environmental Category Check (√) the appropriate type.

- ❑ **IEE Type Project (ADB Category B)**
  - ❑ Terms of Reference for IEE attached
- ❑ **No Further Assessment Needed, however**
  - ❑ Environmental Management Plan Required
  - ❑ Environmental Codes of Practice to be Followed

Part 1: Exclusion Criteria

	Yes	No
General Exclusion Criteria		
Subproject has activities listed on the Prohibited Investment Activities List in Appendix 5 of ADB SPS (2009)		
Subproject does not comply with national environment, health and safety laws and regulations		
Subprojects has potential to cause significant irreversible, diverse or unprecedented adverse environmental impacts (Category A under ADB SPS (2009)).		
Environmental Criteria		
Subproject has potential to directly or indirectly result in conversion or degradation of natural habitat (e.g., primary forests or wetlands) will be included		
Subproject falls within part or in whole within a legally protected area, an area supporting high biodiversity value or qualifying as critical habitat		
Subproject utilizes water from or discharge to a water body in a legally protected area, an area supporting high biodiversity value or qualifying as critical habitat		
Subproject is within natural habitat or in proximity to surface water bodies will have minimal or no operational impacts		
Subproject is within proximity to residential or other sensitive human receptors will have minimal or no operational impacts		
Subproject is such that the structural failure of infrastructure may threaten the safety of local communities		
Subproject has the potential to directly or indirectly result in permanent damage to physical cultural resources of national or international importance		
Subproject will result in removal of any physical cultural resources or lead to destruction/disturbance to historical and cultural places/values will be included;		
Subproject will be undertaken in areas where soil contamination requiring remediation exists		
Subproject does not have a sustainable water supply		
Subproject will utilize a water source of very poor quality, as evidenced by the presence of high levels of pollution		
Subproject will be undertaken where there are water use conflicts or other water security issues		
Subproject require works in sensitive archaeological areas or recognized national, provincial and district monuments of cultural or historical importance		
Subproject will bring about significant change in land use from residential and/or institutional to commercial and/or transport and/or industrial in the vicinity of the subproject site		

If **"yes"** is answer to any question, the subproject is not eligible for funding.

PART 2: SCREENING BASED MYANMAR ENVIRONMENTAL IMPACT ASSESSMENT PROCEDURE Annex 1. Categorization of Economic Activities for Assessment Purposes

Refer to Table 1: Subproject Activity Screening Criteria below. Check (√) the appropriate type.

	EIA Type Project
	IEE Type Project
	No further environmental assessment. However, Environmental Codes of Practice must be followed. (see Appendix 2. Environmental Codes of Practice Environmental Assessment and Review Framework for Climate Friendly Agribusiness Value Chain

Table 1. Subproject Activity Screening Criteria: List of Projects Requiring an IEE or EIA under the Myanmar EIA Procedure (2015)

Annex 1 Ref.	Type and activities of the projects	IEE, Size / Capacity	EIA, Size / Capacity
29	Crop, agro-industrial crop (rubber, palm oil, cocoa, coffee, tea, banana, sugarcane, etc.)	Between 200 - 500 Hectares	≥500 Hectares
30	Seasonal Crop (cereals, pulses, roots, tubers, oil-bearing crops, fibre crops, vegetables and fodder crops)	Between 500 - 3000 Hectares	≥ 3,000 Hectares
41	Irrigation Systems	≥ 100 ha but < 5,000 ha	≥ 5,000 ha
110	Groundwater Development for Industrial, Agricultural or Urban Water Supply	< 4,500 m^3/d	≥ 4,500 m^3/d
111	Dams and Reservoirs	Dam height < 15 m and Reservoir area < 400 ha	Dam height ≥ 15 m or Reservoir area ≥ 400 ha
112	Lake, River and Channel Land Filling that impacts on the Public	Area < 50 ha	Area ≥ 50 ha
114	Dredging	Total < 500,000 t	Total ≥ 500,000 t

Source: Myanmar EIA Procedure (2015), Annex 1

PART3: SCREENING BASED ON ENVIRONMENTAL FACTORS – Rapid Environmental Checklists

Complete the appropriate Rapid Environmental Assessment Checklist forms below. Provide a summary of the results of screening. Include any relevant issues and concerns.

Rapid Environmental Assessment Checklists

Building Activities

This REA template is for the proposed building activities

Instructions:
(i) The project team completes this checklist to support the environmental classification of a project.
(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title: Myanmar Climate Friendly Agribusiness Value Chain Sector Project

Screening Questions	Yes	No	Remarks
A.Project Siting Is the project area adjacent to or within any of the following areas:			
▪ Underground utilities			
▪ Cultural heritage site			
▪ Protected Area			
▪ Wetland			
▪ Mangrove			
▪ Estuarine			
▪ Buffer zone of protected area			
▪ Special area for protecting biodiversity			
▪ Bay			
B. Potential Environmental Impacts Will the Project cause…			
▪ Encroachment on historical/cultural areas?			
▪ Encroachment on precious ecology (e.g. sensitive or protected areas)?			
▪ Impacts on the sustainability of associated sanitation and solid waste disposal systems?			
▪ Dislocation or involuntary resettlement of people?			
▪ Disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?			

Screening Questions	Yes	No	Remarks
▪ Accident risks associated with increased vehicular traffic, leading to loss of life?			
▪ Increased noise and air pollution resulting from increased traffic volume?			
▪ Occupational and community health and safety risks?			
▪ Risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?			
▪ Generation of dust in sensitive areas during construction?			
▪ Requirements for disposal of fill, excavation, and/or spoil materials?			
▪ Noise and vibration due to blasting and other civil works?			
▪ Long-term impacts on groundwater flows as result of needing to drain the project site prior to construction?			
▪ Long-term impacts on local hydrology as a result of building hard surfaces in or near the building?			
▪ Large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ Social conflicts if workers from other regions or countries are hired?			
▪ Risks to community safety caused by fire, electric shock, or failure of the buildings safety features during operation?			
▪ Risks to community health and safety caused by management and disposal of waste?			
▪ Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?			

Checklist for Preliminary Climate Risk Screening

Country/Project Title: Myanmar Climate Friendly Agribusiness Value Chain Sector Project

Screening Questions		Score	Remarks[9]
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?		
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc.)?		
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?		
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?		
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?		

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered **low risk** project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a **medium risk** category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as **high risk** project.

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

Other Comments:

_____

Prepared by: _____

[9] If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

Rapid Environmental Assessment (REA) Checklist

Road Construction

This REA template is for the proposed road building activities

Instructions:
(i) The project team completes this checklist to support the environmental classification of a project.

(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:	Myanmar Climate Friendly Agribusiness Value Chain Sector Project
Sector Division:	South East Asia Department – Environment, Natural Resources and Agriculture

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Cultural heritage site			
▪ Protected Area			
▪ Wetland			
▪ Mangrove			
▪ Estuarine			
▪ Buffer zone of protected area			
▪ Special area for protecting biodiversity			
B. Potential Environmental Impacts Will the Project cause…			
▪ encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?			
▪ encroachment on precious ecology (e.g. sensitive or protected areas)?			
▪ alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?			
▪ deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?			

Screening Questions	Yes	No	Remarks
▪ increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?			
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation during project construction and operation?			
▪ noise and vibration due to blasting and other civil works?			
▪ dislocation or involuntary resettlement of people?			
▪ dislocation and compulsory resettlement of people living in right-of-way?			
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?			
▪ other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?			
▪ hazardous driving conditions where construction interferes with pre-existing roads?			
▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases (such as STI's and HIV/AIDS) from workers to local populations?			
▪ creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents?			
▪ accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials?			
▪ increased noise and air pollution resulting from traffic volume?			
▪ increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?			
▪ social conflicts if workers from other regions or countries are hired?			
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?			

Screening Questions	Yes	No	Remarks
▪ community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning.			

Checklist for Preliminary Climate Risk Screening

Country/Project Title: Myanmar Climate Friendly Agribusiness Value Chain Sector Project

Screening Questions		Score	Remarks[10]
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?		
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc.)?		
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?		
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?		
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?		

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered **low risk** project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a **medium risk** category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as **high risk** project.

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

Other Comments: _____
_____

Prepared by: _____

[10] If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

Rapid Environmental Assessment (REA) Checklist

Irrigation

This REA template is for the proposed irrigation activities

Instructions:
(i) The project team completes this checklist to support the environmental classification of a project
(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title: Myanmar Climate Friendly Agribusiness Value Chain Sector Project

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Protected Area			
▪ Wetland			
▪ Mangrove			
▪ Estuarine			
▪ Buffer zone of protected area			
▪ Special area for protecting biodiversity			
B. Potential Environmental Impacts Will the Project cause…			
▪ loss of precious ecological values (e.g. result of encroachment into forests/swamplands or historical/cultural buildings/areas, disruption of hydrology of natural waterways, regional flooding, and drainage hazards)?			
▪ conflicts in water supply rights and related social conflicts?			
▪ impediments to movements of people and animals?			
▪ potential ecological problems due to increased soil erosion and siltation, leading to decreased stream capacity?			
▪ Insufficient drainage leading to salinity intrusion?			
▪ over pumping of groundwater, leading to salinization and ground subsidence?			
▪ impairment of downstream water quality and therefore, impairment of downstream beneficial uses of water?			
▪ dislocation or involuntary resettlement of people?			

Screening Questions	Yes	No	Remarks
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?			
▪ potential social conflicts arising from land tenure and land use issues?			
▪ soil erosion before compaction and lining of canals?			
▪ noise from construction equipment?			
▪ dust during construction?			
▪ waterlogging and soil salinization due to inadequate drainage and farm management?			
▪ leaching of soil nutrients and changes in soil characteristics due to excessive application of irrigation water?			
▪ reduction of downstream water supply during peak seasons?			
▪ soil erosion (furrow, surface)?			
▪ scouring of canals?			
▪ clogging of canals by sediments?			
▪ clogging of canals by weeds?			
▪ seawater intrusion into downstream freshwater systems?			
▪ introduction of increase in incidence of waterborne or water related diseases?			
▪ dangers to a safe and healthy working environment due to physical, chemical and biological hazards during project construction and operation?			
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ social conflicts if workers from other regions or countries are hired?			
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?			
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (e.g., irrigation dams) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?			

Checklist for Preliminary Climate Risk Screening

Country/Project Title: Myanmar Climate Friendly Agribusiness Value Chain Sector Project

Screening Questions		Score	Remarks[11]
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?		
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc.)?		
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?		
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?		
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?		

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered **low risk** project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a **medium risk** category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as **high risk** project.

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

Other Comments: _____
_____

Prepared by: _____

[11] If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

APPENDIX 2A: ENVIRONMENTAL CODE OF PRACTICE

1. The key issues which need to be adopted to fulfil the Environmental Code of Practice for Category C projects being implemented as part of the Climate-Friendly Agribusiness Value Chain Sector Project have been spelt out in the above document. The intention and detail of the ECOP is actually combined in the below four components which will comprise the relevant capacity building and training for Category C projects.

(i) The example Environmental Monitoring Plan (Table 10) above;
(ii) Table 5. Indicative Impacts - Design and Planning;
(iii) Table 6: Indicative Impacts – Construction; and
(iv) Section IV D - Operation Phase Impacts.

2. As per the capacity building and training, the PMU will work with contractors, communities, and provincial teams to raise awareness regarding the ECOP.

3. Mitigation measures are not detailed as they have been included in the EMP and the key issue elements of the ECOP will be incorporated into tender documents, construction contracts, and operational management procedures. Contractors and PIU will implement these measures, depending upon subproject phases. Effectiveness of the measures will be carefully monitored to determine whether to continue them or to make improvements.

1. The value chain infrastructure improvements of the CFAVC Sector project consists of some subprojects characterized under the environmental category C, such as (a) the sub-output 1.1: infrastructure for production and certification of rice seed where 10 DOA seed farms get improved infrastructure, irrigation, road farm and post-harvest machinery and equipment, seed storage, seed lab, machinery building, training centre, seed testing equipment, meteorological station; (b) the sub-output 1.3: MOALI/ Plant Protection Division and MOC/ Commodity Testing and Quality Management (government) labs upgraded with equipment and instrumentation.

2. Category C projects are unlikely to have adverse environmental impacts and therefore no EIA or IEE is required. However, the environmental implications are reviewed and hence the environmental codes of practice for these subprojects are described in this annexure.

3. To manage and mitigate potential negative environmental impacts, the project applies Environmental Codes of Practice (ECOP); outlined in this document. The ECOPs contains specific, detailed and tangible measures that would mitigate the potential impacts of each type of eligible sub-project activity under the project. They are designed appropriately for the local conditions in Myanmar, simple, and readily useable by the local communities who are the main beneficiaries of the project.[12]

1. THE PROCESS: WHO, WHEN and HOW

4. The ECOPs are to be implemented by villages and/or contractors, with the support of village community facilitators and engineers of the Department of Agriculture (DOA), Ministry of Agriculture, livestock and Irrigation (MOALI) at township level. While community

[12] Annex 8: WB National Community Development Driven Development Project, Environmental and Social Management Framework (19 March 2015).

facilitators will focus on the socialization of the relevant Code and its adoption into community proposals, the DOA township engineers will be responsible for the adoption of the codes into their technical design for the sub-projects. The adoption of these codes will be closely supervised and supported by the DOA engineers at the union level.

5. The adoption of the ECOP will be monitored through the project's annual progress report submitted by the DOA at the Union level. One section of the report should be made available for assessing the application of this environmental management tool; this may include issue(s) or problem(s) in the field and measures or actions undertook in solving the problem(s).

6. The ECOP will be adopted throughout the project cycle, as described in the following table:

Table A2.1: ECOP Project Cycle

	Project Cycle	ECoP Adoption
Preparation and Planning Phase:		
Step 1	Village Meeting: prioritizing proposals, election of representatives for village tract forum	Community facilitators introduce briefly the main objective of ECOP as a mitigation tool to prevent negative environmental impact. The inclusion of the relevant codes will strengthen the design of community investments / subprojects when properly adopted.
Decision Making Phase:		
Step 2	Village Tract forum discusses tract development plan, and select subprojects, selects finance subcommittee	During subprojects selection, facilitators (assisted by the relevant local township engineers) will make sure that ECOPs are adopted in the subproject technical design.
Step 3	Village tract development plan endorsed by township aid management subcommittee	Each subproject proposal will adopt the specific section of the relevant ECOPs.
Implementation Phase:		
Step 4	Implementation of subprojects	Facilitators (assisted by the local township engineers, if needed) will ensure relevant ECOPs are adequately implemented.
Operation and Maintenance Phase:		
Step 5	Operation and maintenance (O&M)	As part of subproject's O & M, facilitators will provide support to village operation and maintenance committee in regard to the implementation of the relevant ECOP.

7. ECOPs applies to all type of investments financed during the first cycle of project implementation, based on a positive list of subprojects that are easier to implement using standardised designs. Standard designs will be modified and/or alternative designs prepared to suit local conditions. Standard designs are available for rural roads, rural water supply, rural bridges, rural electrification, jetties and rural housing.

8. ECOP applies to all type of eligible investments (open menu) financed during the second and third cycle of project implementation; these comprise small-scale new constructions based on an open menu, and typically include small feeder roads, foot-

paths and bridges, small dykes, drinking water systems, rehabilitation of class rooms and health centres, and small-scale rural electrification. The list of sub-projects in this ECOP will be updated annually to cover more activities that are devolved in each project cycle. If subproject impacts are considered to be higher (e.g., water/air/soil pollution), an Environmental Management Plan (EMP) should be prepared before the subproject works may commence.

9. These ECOPs are designed in a way to allow easy adoption during proposal development and sub-project implementation. Each sub-project proposal will adopt a relevant section of the ECOP. Technical facilitators are responsible to ensure the adoption of this specific code into the proposal.

APPENDIX 2B: GENERAL GUIDELINES FOR ENVIRONMENTAL CODE OF PRACTICE

Environmental Codes of Practice

A. General Guidelines (applicable to most rehabilitation and construction activities)
Issue Environmental Prevention/Mitigation Measures

1. Noise during construction

(a) Plan activities in consultation with communities so that noisiest activities are undertaken during periods that will result in least disturbance.
(b) Use noise-control methods such as fences, barriers or deflectors (such as muffling devices for combustion engines or planting of fast-growing trees).
(c) Minimize project transportation through community areas.
(d) Maintain a buffer zone (such as open spaces, row of trees or vegetated areas) between the project site and residential areas to lessen the impact of noise to the living quarters.

2. Soil erosion

(a) Schedule construction during dry season.
(b) Contour and minimize length and steepness of slopes.
(c) Use mulch, grasses or compacted soil to stabilize exposed areas.
(d) Cover with topsoil and re-vegetate (plant grass, fast-growing plants/bushes/trees) construction areas quickly once work is completed.
(e) Design channels and ditches for post-construction flows and line steep channels/slopes (e.g., with palm frowns, jute mats, etc.).

3. Air quality

(a) Minimize dust from exposed work sites by applying water on the ground regularly.
(b) Do not burn site clearance debris (trees, undergrowth) or construction waste materials.
(c) Keep stockpile of aggregate materials covered to avoid suspension or dispersal of fine soil particles during windy days or disturbance from stray animals 67.

4. Water quality

(a) Activities should not affect the availability of water for and availability drinking and hygienic purposes.
(b) No soiled materials, solid wastes, toxic or hazardous materials should be poured or thrown into water bodies for dilution or disposal.
(c) The flow of natural waters should not be obstructed or diverted to another direction, which may lead to drying up of river beds or flooding of settlements.
(d) Separate as best as possible concrete works in waterways and keep concrete mixing separate from drainage leading to waterways.

5. Solid and hazardous waste

(a) Collect and transport construction waste to appropriately designated/ controlled dump sites.
(b) Maintain waste (including earth dug for foundations) at least 300 meters from rivers, streams, lakes and wetlands.
(c) Use secured area for refuelling and transfer of other toxic fluids distant from settlement area (and at least 50 meters from drainage structures and 100 meters from important water bodies); ideally on a hard/non-porous surface.
(d) Train workers on correct transfer and handling of fuels and other substances and require the use of gloves, boots, aprons, eyewear and other protective equipment for protection in handling highly hazardous materials.
(e) Collect and properly dispose of small maintenance materials such as oily rags, oil filters, used oil, etc.

6. Health and safety

(a) Provide personal protective gear for workers as necessary (gloves, dust masks, hard hats, boots, goggles).
(b) Keep worksite clean and free of debris on daily basis.
(c) Keep corrosive fluids and other toxic materials in properly sealed containers for collection and disposal in properly secured areas.
(d) Ensure adequate toilet facilities for workers from outside of the community.
(e) Rope off construction area and secure materials stockpiles/ storage areas from the public and display warning signs. Do not allow children to play in construction areas.
(f) Fill in all earth borrow-pits once construction is completed to avoid standing water, water-borne diseases and possible drowning.
(g) Each construction sub-project to have a basic first-aid kit with bandages, antibiotic cream, etc.

7. Other

(a) No cutting of trees or destruction of vegetation other than on construction site.
(b) No hunting, fishing, capture of wildlife or collection of plants.
(c) No use of unapproved toxic materials including lead-based paints, un-bonded asbestos, etc.
(d) No disturbance of cultural or historic sites.

B. *Specific Environmental Codes of Practice/Technical Guidelines for Construction and/or Rehabilitation*

1. Buildings

In general:

a) Provide adequate drainage in the building's immediate surroundings to avoid standing water, insect related diseases (malaria, etc.) and unsanitary conditions.
b) Include sanitary facilities such as toilets and basins for hand-washing.
c) Avoid use of asbestos cement tiles as roofing.

2. Rural Roads, Bridges and Jetties

a. Roads connecting villages, between villages and township

General Considerations:

(i) Control placement of all construction waste (including earth cuts) to approved disposal sites (at >300 m from rivers, streams, lakes, or wetlands). Dispose in authorized areas all of garbage, metals, and excess materials (fuels, oil, grease) generated during construction. Never dispose spent oils on the ground and in water courses as it can contaminate soil and groundwater.
(ii) Erosion control measures should be applied before the rainy season begins, preferably immediately following construction. Maintain, and reapply the measures until vegetation is successfully established.
(iii) Sediment control structures should be applied where needed to slow or redirect runoff and trap sediment until vegetation is established.
(iv) Spray water on dirt roads, cuts, fill materials and stockpiled soil to reduce wind-induced erosion, as needed.
(v) Avoid road construction through primary forests as it gives access to illegal logging.
(vi) Avoid road construction in unstable soils, steep slopes and nearby river banks. Additional measures (see the section below) need to be applied should there be no alternatives for road alignments.

b. Protect slopes from erosion and landslides by the following measures:

(i) Plant locally available, fast-growing grass on slopes prone to erosion. These grasses help stabilize the slope and protect soil from erosion by rain and runoff. Locally available species possessing the properties of good growth, dense ground cover and deep root shall be used for stabilization.
(ii) Provide interceptor ditch, particularly effective in the areas of high intensity rainfall and where slopes are exposed. This type of ditch intercepts and carries surface run-off away from erodible areas and slopes before reaching the steeper slopes, thus reducing the potential surface erosion.
(iii) For steep slopes, a stepped embankment (terracing) is needed for greater stability.
(iv) Place a retaining wall at the lower part of the unstable slope. The wall needs to have weeping holes for drainage of the road sub-base, thus reducing pressure on the wall.
(v) Rocks (riprap) can be used in addition to protect the slope.
(vi) Prevent uncontrolled water discharge from the road surface by sufficiently large drainage ditches and to drain water away from the down slope.

3. Small bridges Erosion protection: (less than 10 meters)

a. The main method of slope and erosion protection is the construction of gabions (gravity walls that support embankments or slopes which have a potential to slip) and ordinary stone pitching:

(i) The slope of gabions should be in the ratio of at least 1 vertical: 2 horizontal. Flatter slopes may be adopted depending on the site terrain.
(ii) The filling of the gabions should be from strong and competent rock which is laid very closely packed to maximize the weight.
(iii) Bracing wire should be used to prevent the gabion bulging out. The bracing wire should be placed at each third of the gabion height.
(iv) The gabions should be firmly anchored into the ground by founding the gabions below the expected scour depth level.
(v) In cases where stone pitching is not provided, the top layer should be covered by soil to encourage the growth of grass and the stabilization of the slopes.

Stone pitching may be provided as the only erosion protection measure in those cases where the erosion potential is deemed minimal. Stone pitching is not very resistant to strong water current and is mainly used as the top finish on gabion walls.

b. Water Quality and Fauna

(i) Restrict duration and timing of in-stream activities to lower flow periods (dry season) and avoid periods critical to biological cycles of valued flora and fauna (e.g., spawning)
(ii) Water flow diversion is not advisable; if it is impossible to avoid, impacts should be assessed, and mitigation proposed.
(iii) Establish clear separation of concrete mixing and works from drainage areas and waterways.

c. Culverts

(i) Remove all formwork from inside the culvert (after concrete has reached full strength). Formwork that is not removed will rot eventually, drop down and obstruct the free flow of water.
(ii) Place large stones at the outlet of the culvert to prevent erosion.
(iii) Keep the culvert inlets free from sand and gravel – the water must flow through the culvert.
(iv) Build a sand trap upstream of the culvert to prevent accumulation at culvert inlets (sand traps will have to be cleaned periodically).

(v) Ensure that the water of the adjacent road sections can flow freely into the roadside ditch.

4. Rural Water Supply

a. Wells (deep/shallow)

(i) Should be equipped with slab around the well for easier drainage, a crossbeam and a pulley to support the use of only one rope and bucket for collecting water. One rope and bucket is more hygienic for the well and water.

(ii) Steel rungs (placed inside wall of a deep well) are essential for maintenance of a well or in case of an emergency.

(iii) A groundwater well usually has a wide open water area. It is necessary to provide a cover/roof/wire mesh on top to protect this area from falling leaves or debris.

(iv) Wells should always be located upstream of the septic tank soak-away. Build the soak-away as far away as possible from the well (minimum 15 m/50 feet) as it can influence the quality of the drinking water when it is too close (health risk).

(v) Before using a new water source, take samples for testing; minimum key parameters for water testing: total coliform, pH, Arsenic, Nitrate, color, turbidity, and temperature. Water quality should also be monitored in the case of all wells rehabilitations as part of the project.

b. Spring

(i) Every spring capture should be equipped with a filter and a sand trap. Add a wall between the inflow and the outlet pipe to create chamber for settling out sand; build the wall with a notch (lowered section) for controlled flow. Sand must be cleaned out periodically (O&M).

(ii) Collection basin for spring capture needs to have a perforated PVC pipe (holes diameter 2mm) to be used as a screen for the water intake. Alternatively, a short pipe with wire mesh (screen) around the open end should be provided.

(iii) Collection basin needs to have a fence to protect the spring from public access and risk of contamination; and a roof/cover over the spring to prevent leaves or other debris from entering the basin.

c. Rainwater harvesting

(i) Rainwater storage reservoir should be intact, connected to roof gutter system, with all faucets and piping intact.

(ii) If distribution pipes are attached into the storage reservoir, install the distribution pipes 10cm above the storage/tank bottom for better use of the storage capacity.

(iii) Cover must be fitted tightly onto the top of the storage reservoir to avoid overheating and growth of algae (from direct sunlight), and to prevent insects, solid debris and leaves from entering the storage tank.

(iv) A ventilation pipe with fly screen should be placed in the cover to help aerate the tank/reservoir which is necessary for good water quality.

(v) Roof gutters need to be cleared regularly, as bird and animal feces and leaf litter on roofs or guttering can pose a health risk if they are washed into the reservoir tank.

(vi) Reservoir tanks need an overflow so that in time of heavy rain, the excess water can drain away. The overflow should be designed to prevent backflow and stop. vermin/rodents/insects entering the system. A good design will allow the main storage tank to overflow at least twice a year to remove build-up of floating sediment on the top of the stored water and maintain good water quality.

d. Installation/ Rehabilitation of pipelines from natural springs

Preventing contamination at water sources:

(i) Build a structure with roof over the water source to prevent leaves or other debris from entering into the basin.
(ii) A fence is needed to protect the water sources (springs particularly) from public access and risk of contamination.
(iii) The sand/gravel filter traps sediment before the spring flow enters the collection chamber and has to be changed during periodical maintenance.

e. Small-scale Irrigation

(i) Masonry walls (along the road) or stone riprap should be built to prevent erosion on a sloped bank.
(ii) May use bamboo as bank protection along the rice fields as the loads are low.
(iii) A bar screen (vertical bars; about 20mm diameter with an approximate 10 cm clear distance for easy maintenance) is essential in front of any inlet structure (upstream) to prevent large objects and debris blocking the irrigation canal. The angle between the bottom of the canal and the screen shall be between 45 to 80 degrees.

f. Sanitation Facilities

(i) All toilets must have a septic tank to provide primary treatment of fecal waste.
(ii) PVC pipe used to connect pour-flush toilet to a septic tank must be buried underground or covered over (with cement) for protection and to prevent exposure to sunlight.
(iii) Metal pipe is a preferred choice to be used as the gas vent pipe on septic tanks. Never use PVC pipe as it is unable to withstand long-term exposure to sunlight.
(iv) Septic tanks must have a vent pipe to prevent the build-up of gas inside the chamber and shall have a 'manhole' that provides access inside the tank if needed.
(v) A toilet should be at least 20 meters from water sources (well, spring, river).

g. Septic tanks: Small-scale waste treatment facilities

(i) Septic tanks must have a vent pipe to prevent the build-up of gas inside the chamber and shall have a 'manhole' that provides access inside the tank if needed
(ii) Ensure that the septic tanks have two chambers: first chamber is for settling of sludge, and the second chamber is for aerobic treatment. These chambers will generally treat wastewater better. Partially treated septic tank effluent can pollute groundwater and surface water.
(iii) Do not discharge septic tank effluent to an open drain or other surface water. The effluents need to be treated before final disposal. This may be achieved through: (a) an underground leach field, (b) a vegetated leach field, or (c) a pit for soaking away.
(iv) Septic tanks must be inspected periodically and the accumulated sludge must be emptied (by pumped out) every few years for the tank to continue to function properly.

h. Solid waste disposal

(i) Solid waste depots/disposal need to be located on hard-standing areas that prevent waste entering surface or groundwater.
(ii) Waste depots/storage/disposal should be contained, sealed and/or roofed/covered to prevent storm water contamination. Wastes need to be emptied regularly.

APPENDIX 3: EXAMPLE ENVIRONMENTAL MANAGEMENT PLAN

1. The matrix below summarizes the typical potential impacts of subprojects developed as part of the Climate-Friendly Agribusiness Value Chain Sector Project. It also outlines corresponding mitigation measures designated to minimize those impacts.

2. The mitigation measures, suitably adapted to particular subprojects and locations, will be incorporated into tender documents, construction contracts, and operational management procedures. Contractors, PIC, PMUs and IWRUMDs will implement these measures, depending upon subproject phases. The effectiveness of these measures will be carefully monitored and watched via environmental monitoring to determine whether to continue them or to make improvements.

Table A3.1: EMP - Typical Potential Impacts and Mitigation Measures

Item	Environmental Impacts & issues	Mitigation Measures and/or Safeguards	Who Implements	Who Supervises	Costs ($)
Pre-construction					
1.1 Design Stage	Baseline water quality	Establish baseline water quality for surface water (see monitoring plan)	Consulting contractors	PIC	Included in monitoring costs
1.2 Construction Preparation Stage	Environmental management budget	Confirm budgets for implementation of environmental management measures and environmental supervisory responsibilities. Assign final budget allocations against each of the items in	PIC	PSC	Design costs
	Update EMP	Updating EMP: Mitigation measures defined in this EMP will be updated and incorporated into the detailed design to minimize adverse environmental impacts.	ESO	PIC	Design costs
	Incorporate environmental management into contract documents	Contract documents: Preparation of the environment section in the Terms of Reference for bidders for construction contracts, and environmental contract clauses for contractors, namely the special conditions for the protection of the water, soil and air environments (referencing the EMP and monitoring plan).	ESO	PIC	Design costs
1.3 Construction support preparation	Environmental education and awareness	Environmental Protection Training: Environmental specialists (including PIC) and/or officials from local ECD offices will be invited to provide training on implementation and supervision of environmental mitigation measures to PMU and IWRUMDs.	ESO and ECD officers as required	PIC	Included in project training budget
		Environmental Protection Training: ESO, PIC and/or officials from local MOE offices will be invited to provide training on implementation and supervision of environmental mitigation measures to contractors.	ESO and PIC	PIC	Part of EMP training costs factored. Materials costs of $200 per session.

Item	Environmental Impacts & issues	Mitigation Measures and/or Safeguards	Who Implements	Who Supervises	Costs ($)
	Complaints procedures established	The project Grievance Redress Mechanism will be established and local contact points for the subprojects publicized	ESO and PIC	PSC	Part of Design costs
	Site planning	Prepare a Site Environmental Management and Supervision Manual, including an emergency preparedness and response plan for construction emergencies and site environmental health and safety plan.	Contractors	ESO and PIC	Part of construction costs
Construction					
2.1 Water	Pollution from construction wastewater	Construction wastewater from the main construction sites will not be discharged onto the surrounding soil or into surface water systems (canals). Sedimentation tanks will be provided, and after settling out of solids the upper clear liquid will be recycled for spraying the construction site (dust control), and the waste residue will be transported to disposal sites where they will not contaminate agricultural soils or waterways. Oil-containing wastewater will require the	Contractors	PMU and PIC	Contractor responsibility & part of costs.
	Hazardous materials	To prevent pollution of soil and surface water/groundwater: (i) storage facilities for fuels, oil, cement, and chemicals will be within secured areas on impermeable surfaces, provided with bunds and clean-up installations; (ii) vehicle, machinery, and equipment maintenance and re-fuelling will be carried out in such a way that spilled materials do not seep into the soil; (iii) oil traps will be provided for service areas and parking areas; (iv) fuel storage and refilling areas will be located at least 50	Contractors	ESO and PIC	Contractor responsibility & part of costs.
2.2 Air	Air quality	Equipment will be maintained to a high standard to ensure efficient running and fuel-burning. High-horsepower equipment will be provided with tail gas purifiers. All vehicle emissions will be in compliance with relevant Myanmar emission standards.	Contractors	ESO and PIC	Contractor responsibility & part of costs.
	Dust	Material stockpiles and concrete mixing equipment will be equipped with dust shrouds. For both construction sites and construction roads, water spraying for the suppression of dust and maintenance of driving surfaces will be standard site management practice. Vehicles carrying soil, sand, or other fine materials to and from the construction sites will be	Contractors	ESO and PIC	Contractor responsibility & part of costs.

Item	Environmental Impacts & issues	Mitigation Measures and/or Safeguards	Who Implements	Who Supervises	Costs ($)
2.3 Noise and Vibration	Noise impacts on sensitive receivers	Construction at night within 280m of residences shall be strictly prohibited. During daytime construction, the contractor will ensure that: (i) sites for concrete-mixing plants and similar activities will be located at least 1 km away from residences and schools; and (ii) temporary anti-noise barriers will be installed to shield any schools or residences	Contractors	ESO and PIC	Contractor responsibility & part of costs.
2.4 Solid wastes	Demolition waste	Any waste from the demolition of un-repairable sluice and gate structures will be either sold to building material recyclers or collected and transported to official landfill sites. Metal parts, including pumps and pipes will be broken up and sold to scrap metal merchants. Any excess spoil will be made available to nearby communities for use as building pads and bunds.	Contractors	ESO and PIC	Contractor responsibility & part of costs.
	Dredge spoil	The sediment quality of spoil from channel clearing or dredging will need to be tested and assessed for contamination before reuse. The sediment testing results will determine the requirements to ensure safe disposal or reuse.	Contractor	PIC	A unit cost of $80 per specific element being tested for.
	Waste from worker camps	Contractors will provide toilets with pump-out and disposal facilities and sufficient garbage bins at strategic locations and ensure that they are (i) protected from birds and vermin, (ii) emptied regularly (using the nearest township solid waste system and landfill), and (iii) do not overflow	Contractors	ESO and PIC	Contractor responsibility & part of costs.
2.5 Soil erosion and ecology		Erosion control will include: (i) limiting construction and material handling during periods of rains and high winds; and (ii) stabilizing all cut slopes, embankments, and other erosion-prone working areas while works are going on. All earthwork disturbance areas shall be stabilized within 30 days after earthworks have ceased at the sites.	Contractors	ESO and PIC	Contractor responsibility & part of costs.
2.6 Social and Cultural	Impacts to local cultural sites	Contractors will ensure that all local cultural sites (including shrines and graves) will be kept clear of construction material and protected from dust and other disturbance. Access to these sites will not be impeded. After construction is finished any disturbed surroundings will be restored to pre-construction standards.	Contractors	ESO and PIC	Contractor responsibility & part of costs.

Item	Environmental Impacts & issues	Mitigation Measures and/or Safeguards	Who Implements	Who Supervises	Costs ($)
2.7 EHS	Community health and safety	Community health and safety will be safeguarded by: 1) Planning construction activities so as to minimize disturbances to residents, utilities and services. Temporary land occupation will be planned well ahead of construction to minimize its impact. Land will be reinstated to its original condition after construction. 2) Implementing safety measures around the construction sites to protect the public, including warning signs to alert the public to potential safety hazards, and barriers to prevent public access to construction sites.	Contractors	ESO and PIC	
	Environmental, Health, and Safety Guidelines.[13]	Measures to ensure occupational health and safety will include: Contractors shall be required by the PMU to ensure that their workers and other staff engaged in the proposed constructions are in a safe environment; Following the award of construction contracts, the successful contractors will prepare site environmental health and safety plan, for approval by the PMU;	Contractors	ESO and PIC	Project Contingency by Contractor
2.8 Unexpected environmental impacts		If unexpected environmental impacts occur during project construction phase, the PMU will update the EMP, and environmental protection measures will be designed and resources will be utilized to cope with these impacts	PMU and PIC	PSC	Project Contingency by Contractor
Operation					
3.1 Management of Irrigation	Implementation of extraction and drainage plans	Irrigation schemes to be operated strictly in concurrence with extraction and irrigation plans which ensure sustainability of supply.	Contractors and WUGs	IWRUMD	
	Canal fisheries	Informal canal fisheries rights safeguarded for local farmers	WUGs	ESO / PIC	-

[13] A recommended compendium for relevant standards is the IFC web page: http://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/ifc+sustainability/our+approach/risk+management/ehsguidelines

Item	Environmental Impacts & issues	Mitigation Measures and/or Safeguards	Who Implements	Who Supervises	Costs ($)
3.3 Emergency response Planning	Floods and extreme weather events	The project will promote the development of community based disaster readiness programs at the irrigation and drainage communes with particular reference to flooding and other natural disasters.	Project output	ADB	$200 for handout materials.

ADB = Asian Development Bank; ESO = environmental safeguards officer (of PMU); IWRUMD = Irrigation and Water Resources Utilization Management Department ; MONREC = Ministry of Natural Resources and Environmental Conservation; PIC = project management and implementation consultants; PMU = project management unit; PSC = project steering committee. WUGs = water user groups.
Source: Asian Development Bank.

APPENDIX 4: TERMS of REFERENCE

International Environment Supervision Consultant

National Environment Specialists

1. An International Environment Supervision Consultant (ESC) is required for 6 person-months to supervise and monitor the implementation of the environmental safeguards. One of more National Environmental Specialists, are required for a total 20 person-months each supervise and monitor the implementation of the environmental safeguards.

2. The International Environment Supervision Consultant (ESC) will undertake the initial quarterly monitoring, working with the National Environmental Specialist (NES). Subsequent quarterly monitoring will be carried out by the NES. The ESC will undertake semi-annual monitoring and report preparation working with the NES. The required semi-annual report environmental report will be based on the results of monthly monitoring. The ESC, with assistance from the NES, will design and organize an environmental management capacity building and training program for MOALI, PIC, and Contractors' staff.

3. The specific tasks to be undertaken by the ESC/NES team will include the following:

a. Preparation of Environmental Management Plans

i. environmental screening of subprojects;
ii. preparation of IEEs and ECOPs based on the EARF (working with the feasibility study and detailed design contraxctor where necessary);
iii. ensuring all publication consultation and disclosure requirements are met; and
iv. assisting the PMU to submit and obtain approvals for IEEs.

b. Supervision and Monitoring

i. Assist the MOALI PMU to ensure that the EMPs and ECOPs are included in the bidding documents and civil works contracts;
ii. prior to construction, organize a training program for the MOALI PMU and PIUs on how the environmental aspects of the project will be monitored, giving emphasis on CEMP evaluation; compliance monitoring of construction activities and preparation of corresponding reports; supervision responsibilities and interaction with Contractors; and documentation, resolution and reporting of non-compliance issues and complaints;
iii. recruit a qualified service provider to conduct the training program;
iv. provide guidance to the PMU and PIUs on the environmental aspects of the project with emphasis on compliance monitoring and reporting;
v. assist the PMU will establishment and operation of the grievance redress mechanism;

vi. review the Contractors' Environmental Management Plans (CEMPs) and recommend to the PIC modifications to the CEMPs to be compliant with the: (a) environmental requirements of the construction contracts as reflected in the environmental management plan (EMP), (b) the conditions of environmental approvals of the MONREC and the Environmental Compliance Certificate, and (c) ADB's Safeguards Policy Statement (SPS, 2009);

vii. develop the compliance monitoring system to be used during the construction period for monitoring the Contractors' performance relative to the environmental requirements, including the preparation of: (a) monitoring and corrective action forms/checklists, (b) inspection procedures, and (c) documentation procedures;

viii. conduct orientation sessions with the Contractors on the compliance monitoring system to be used, notification of non-compliance, and the process of requiring Contractors to implement corrective measures when necessary;

ix. supervise the implementation of CEMPs;

x. supervise all ambient environmental monitoring (water quality, air quality, and noise levels) conducted by independent third party environmental monitoring Contractors;

xi. undertake quarterly inspection, monitoring and reporting of construction sites and all construction-related facilities (workers' camps, borrow pits, disposal sites for spoil and unsuitable materials, equipment maintenance areas, fuel and materials storage sites, project-specific quarries and crushers, etc.) to assess the Contractors' compliance with the CEMP;

xii. through the PMU, require the Contractors to update their respective CEMPs when necessary;

xiii. monitor the Contractors' compliance with health and safety requirements of the project as stipulated in the contract documents;

xiv. prepare monthly quarterly monitoring reports for submission to the PMU and draft semi-annual environmental safeguard monitoring reports, as required by ECD and ADB, for submission to PMU and MOALI; and

xv. upon completion of construction, prepare a report on the project's environmental compliance performance, including lessons learned that may help MOALI in its environmental monitoring of future projects. The report will be an input to the overall project completion report.

c. Qualifications:

1. **International Environmental Supervision Consultant**

Professional Engineering Designation, Master's or higher degree in environmental engineering or civil engineering, or a Master Degree in Environmental Sciences.

- Demonstrated experience in environmental design and environmental management for transmission projects
- Minimum General Experience: 15 years
- Minimum Specific Experience (relevant to assignment): 8 years
- Regional/Country Experience: Greater Mekong Subregion

2. **National Environmental Specialists**

- Bachelor's or higher degree in environmental science or a related field.
- At least 5 years' experience in environmental sector
- Demonstrated EIA experience.
- Minimum General Experience: 5 years
- Minimum Specific Experience (relevant to assignment): 3 years
- Regional/Country Experience: Myanmar

Surface Water Quality Monitoring Contractor

Background

Due to its proximity to activities both within a project site as well as up-stream, the quality of surface and ground water can quite easily be contaminated or polluted such that it can threaten the ecology of associated aquatic life, be a threat to the health of livestock and humans, and be virtually useless for agricultural purposes for which it is equally important. It is therefore important to establish and maintain standards against which water quality can be monitored and maintained. Gathering baseline information regarding water quality is a pre-requisite for such an exercise.

Qualification

It will be necessary to sub-contract water quality testing to a suitably dedicated company with appropriate laboratory facilities. The company needs to be able to demonstrate competence in assaying water and delivering comprehensive written reporting. It is the responsibility of the company to offer documented evidence of its qualifications.

Tasks

The objective of the testing is to carry out an evaluation to identify, analyse and mitigate any potential adverse health risks and environmental impacts associated with the water system, and in particular to establish baseline information against which the site management during implementation of sub-projects can be monitored. While agricultural activity constitutes the major water use, it needs to be recognized that availability of clean and safe water is critical for livestock as well as some domestic use.

- Sampling of water will take place for all subprojects where construction and implementation coincide with surface and ground water bodies.

- Water sample testing needs to be completed at the commencement of site works, and tested again at mid-way point of any construction activity, and then at the completion of works.

- Provide clear documentation of the protocols followed for water sample collection including position from which test was taken, time of day and date, methodology and protocols for collection.

- Complete comprehensive assessment of surface water samples, specifically for the following:

    - pH, SS, EC, NH_4+, NO3-, PO4 3, DO, BOD5, COD, Oil & Grease, Coliforms *(E. Coli).*