

Environment and Social Management Framework

Sri Lanka Integrated Watershed and Water Resources Management Project

Ministry of Mahaweli, Agriculture, Irrigation and Rural Development

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Abbreviations and Acronyms

CEA	Central Environmental Authority
CCD	Coast Conservation Department
CEB	Ceylon Electricity Board
CKD	Chronic Kidney Disease
CPF	Country Partnership Framework
CPS	Country Partnership Strategy
DMC	Disaster Management Center
DSRP	Dam Safety Review Panel
DSWRPP	Dam Safety and Water Resources Planning
DWLC	Department of Wildlife Conservation
EA	Environmental Analyses
ECOP	Environmental Codes of Practice
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
ESMP	Environmental and Social Management Plans
EPL	Environmental Protection License
EPP	Emergency Preparedness Plan
ERR	Economic Rate of Return
ESMF	Environmental and Social Framework
FD	Forest Department
FFPO	Fauna and Flora Protection Ordinance
FO	Farmer Organization
GCF	Green Climate Fund
GIS	Geographic Information System
GOSL	Government of Sri Lanka
GSMB	Geological Survey and Mines Bureau
HMIS	Hydrometeorological Information Systems
IAs	Implementing Agencies
ICOLD	International Committee of Large Dams
ICR	Implementation Completion Report
ID	Department of Irrigation
IEE	Initial Environmental Examination
ISCs	International Support Consultancies
ISR	Implementation Status and Results Report
IWWRMP	Integrated Watershed and Water Resources Management Project
LSA	Livelihood Support Assistance
M&E	Monitoring and Evaluation
MASL	Mahaweli Authority of Sri Lanka
MIWRDM	Ministry of Irrigation, Water Resources and Disaster Management
MMDE	Ministry of Mahaweli Development and Environment
MPCLG	Ministry of Provincial Councils and Local Government
MRRP	Mahaweli Restructuring and Rehabilitation Project
NCDS	National Center for Dam Safety
NEA	National Environmental Act
NPC	Northern Provincial Council
NPV	Net Present Value
NWSDB	National Water Supply and Drainage Board

NWUP	National Water Use Plan
O&M	Operation and Monitoring
OP	Operational Policy
PDO	Project Development Objective
PID	Provincial Irrigation Department
PIM	Project Implementation Manual
PMU	Project Management Unit
RDA	Road Development Authority
RAP	Resettlement Action Plan
REDD	Reducing Emissions from Deforestation and forest Degradation
RPF	Resettlement Policy Framework
SALT	Sloping Agricultural Land technology
SDR	Special Drawing Rights
SEA	Strategic Environmental Assessment
SOP	Seasonal Operation Plan
SWAT	Soil Water Assessment Tool
WBG	World Bank Group
WMS	Water Management Secretariat
WRB	Water Resource Board
WRM	Water Resources Management

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1.1 Project Concept and Objective

The Global Climate Risk Index 2018¹ ranks Sri Lanka as the fourth among the most affected countries of the World. These impacts are already starting to show with severe and long duration droughts followed by severe flooding occurring almost every year in several parts of the country. Water availability is also becoming more variable and uncertain and studies show that these trends are likely to exacerbate, and the wetter areas of the country would eventually become wetter and the drier areas drier. As a response, to the expected economic, social and environmental losses, the Government of Sri Lanka has developed The Sri Lanka Integrated Watershed and Water Resource Management Project (IWWRMP). The systematic implementation of this project is expected to address and adapt to some of the adverse climate change impacts projected for the country.

Sri Lanka's water resources are critically important to sustain the country's socio-ecological integrity and development goals. The island's major rivers originate from the mountains in the central region and radiate out to the lowlands to distribute water across the country. Thus, the mountains are the water towers for the entire country and are critical for sustaining both life and economic development aspirations. However, over the years, forest cover in the upper watersheds have been extensively modified or degraded, with the remaining forests being highly fragmented. The natural montane wetlands and marshlands which were water retention and holding areas that facilitated infiltration and percolation have been converted to agricultural lands and other anthropogenic land uses. This in turn leads to poor quality water and reduced overall water productivity. Unsustainable provisions of water limit national economic development and can lead to adverse health and livelihood conditions.

These changes are now resulting in increased incidences of flash floods, soil erosion, and landslides with the emergence of extreme weather events attributed to climate change. The lowered capacity for water infiltration and retention in the upper watershed areas has also contributed to water shortages in the mid-mountain and lowlands, affecting agriculture and industrial growth, community and individual livelihoods, and even lives. Unplanned settlements, industrial projects, and maladaptive agricultural practices are creating additional water stresses. It is estimated that approximately 80% of the river basins have greatly reduced their water quality and quantity due to these unplanned activities.

With the support of many donor agencies like Asian Development Bank, and Green Climate Fund government of Sri Lanka has initiated many watershed management programs. While those cover some parts of Uma Oya, Walawa Ganga, Kirindi Oya, Kalu Ganga watershed and upper side of the Knuckles watershed, the current project anticipating World Bank funding, will focus on the upper Mahaweli catchment as the first component. Sustainable strategies coupled with a new environmentally friendly system would enhance existing natural water resources, demand management, and achieve higher efficiency which are part of the response to meet today's increasing demands on our available water resources.

¹ <https://germanwatch.org/en/download/20432.pdf>

1.2 The Project Development Objective

The PDO of the project is to Improve watershed and water resource planning and enhance the functionality of water resources infrastructure. Functionality refers to improved safety of dams and improved water distribution networks of irrigation.

1.3 Project Description

The Project design includes four components including a contingency component to allow for rapid reallocation of funds in case an emergency arises, as below:

1.3.1 Component 1: Watershed and Water Resources Planning (US\$13.7 million of which US\$8.7 million IDA concessional and US\$5 million Government funds)

This component seeks to help plan and restore the Upper Mahaweli Watershed. Phase I (Year 1–3, mainly Subcomponent 1.1) of the WSM activities will focus on planning, which will be followed by phase II (Year 3–5, mainly Subcomponent 1.2), which will be for restoration and related infrastructure investments. This component will also support lead WRM agencies—the Mahaweli Authority of Sri Lanka (MASL) and the WRB—on overall water resources planning and management.

Subcomponent 1.1: Watershed management planning (US\$1 million IDA concessional)

The subcomponent will help develop a WSM plan for the upper Mahaweli watershed through a consultative approach, with activities to be implemented at mini-watershed levels. The plan will be based on an evidence-based diagnostic assessment of land use focusing on forests, active erosion, sediment generation, and agricultural practices. Better managed and restored watersheds will protect against further environmental degradation (caused by erosion and sedimentation), optimize streamflow for the various water uses, and reduce the incidence and impacts of extreme weather events. These will in turn make the residents of the targeted watersheds more resilient to climate-related floods and landslides. Improved WSM planning will help ensure that soil and vegetation that sequester CO₂ will be better protected. The subcomponent seeks to increase women's voices in WSM committees and leadership to ensure that the needs, priorities, and knowledge of both women and men are considered in the WSM plans.

Subcomponent 1.2: Watershed restoration (US\$5 million Government funds)

This subcomponent will be confined to the Upper Mahaweli Watershed with the intention of demonstrating a scaled approach for future replication in adjacent watersheds. The subcomponent will finance the works, goods, and services required to implement prioritized on- and off-farm WSM activities in the WSM plans to restore the hydrological and ecological functioning of watersheds and enhance the sustainability of existing land uses. This subcomponent has estimated net emissions of –268,370 tCO₂eq through reforestation, increase in water flows and reduction in sedimentation, and sustainable landscape management and erosion prevention, and, in turn, improve their resilience to climate shocks, as explained under Subcomponent 1.1.

Implementing the WSM component in the Mahaweli Ganga basin also enables the important link between the upper WSM approach with the operation and management of the downstream water development system. The entire basin serves 141,000 ha of irrigation and generates 875 MW of hydropower, and its sustainability and vitality depend directly on the health and resilience of the upstream watershed.

Subcomponent 1.3: Multi-sector water resources planning (US\$7.7 million IDA concessional)

This component will support the water agencies in Sri Lanka to shift toward an integrated water management approach with the participation of key stakeholders. As IWWRMP offers various tools to optimize access to

water and protect the environment (facilitating the restoration of basins), it is central to enhancing communities' adaptive capacity to climate change, particularly floods and droughts. Moreover, involving key stakeholders will also facilitate water conservation efforts.

- (a) **Strengthening the bulk water allocation expansion and enhancing the existing bulk water allocation model of the Water Management Secretariat in the MASL.** This subcomponent will include (i) improving the existing reservoir simulation model by adding advance modelling tools such as inflow forecasting facilities and short-term reservoir simulator with technical assistance to cover all the river basins managed under WMS; (ii) improving data utilization on system management through enhancing real-time monitoring on downstream water management nodes to decrease system response time and synchronizing overall operations into a central monitoring center; and (iii) expanding the existing Hydro-Meteorological Information System (HMIS) network by establishing 120 HMIS stations to obtain the real-time hydrometric data for forecasting and planning for the Irrigation Department (ID) and MASL.
- (b) **Groundwater management.** This subcomponent will support the WRB in the development of knowledge-based integrated groundwater management basin plans in eight pilot basins. It will finance (i) aquifer investigation including exploratory, observation, and pump-test wells and mapping and productivity assessment of aquifers; (ii) development of groundwater management tools, guidelines, and regulations; (iii) preparation of a groundwater management plan; (iv) establishment of provincial groundwater management centers (PGWMCs) that will have the role and functions to monitor, manage, and protect the aquifers and their dependent ecosystems within the basins; and (v) capacity building of the WRB and the provincial centers, including expanding their centralized and provincial information management systems to accommodate real-time groundwater monitoring and its full integration with databases in the national water data center supported under this component.
- (c) **Support for policy and institutional arrangements for dam safety.** This subcomponent will also support the continuation of the program started under the DSWRPP for the establishment of long-term arrangements for the safety of dams. The project will play a leading role in facilitating a process to support the Government in instituting dam safety policies and developing guidelines for dam safety monitoring and inspection.

1.3.2 Component 2: Infrastructure Improvements (US\$59.2 million, of which US\$32.5 million IDA concessional and US\$25.8 million IDA transitional)

The aim of this component is to enhance the efficiency, safety, and durability of hydraulic assets and support the institutional arrangements for ensuring proper management and oversight. More reliable and durable water infrastructure, combined with more efficient irrigation systems, will not only increase water supply and decrease demand for water but also reduce the risk and impacts of floods and droughts. All these factors will enhance the resilience of beneficiaries, especially farmers, to these extreme weather events.

The subcomponent will undertake

- (a) Canal rehabilitation and dam safety remedial works, which could not be funded by the previous DSWRPP. The works involve dams and irrigation structures to be rehabilitated by the ID, Eastern Provincial Council (EPC), MASL, and Northern Provincial Council (NPC) and preparing and updating their operation and maintenance (O&M) manuals. Altogether 55 subprojects have been proposed for rehabilitation;
- (b) Emergency Preparedness Plans (EPPs) for select high-risk dams; and

- (c) Support to farmer organizations (FOs) to carry out the O&M of the rehabilitated canal systems.

1.3.3 Component 3: Contingent Emergency Response (US\$0.0 million)

This contingent emergency response component will allow for rapid reallocation of project proceeds in the event of a natural or man-made disaster or crisis that has caused or is likely to imminently cause a major adverse economic and/or social impact. To trigger this component, the Government of Sri Lanka (GoSL) would need to declare an emergency or a state of a disaster or provide a statement of fact justifying the request for the activation of the use of emergency funding. Funds can be reallocated to this subcomponent following a joint decision by the GoSL and the World Bank. This subcomponent will finance expenses on a positive list of goods, works, services, and emergency operation costs required for emergency recovery, as detailed in the Project Implementation Manual (PIM) prepared for the project.

1.3.4 Component 4: Project Management (US\$2.5 million, of which US\$2 million IDA concessional and US\$0.5 million from Government funds)

This component will support project management, coordination, and monitoring and evaluation (M&E) through the Project Management Unit (PMU) established in the Ministry for Mahaweli, Agriculture, Irrigation & Rural Development (MMAIRD). The PMU will be supported to ensure the quality of overall project management while ensuring smooth coordination of activity implementation by various implementing agencies. This component will finance (a) the consultancy and operating costs of the PMU and of implementing agencies, including for fiduciary and safeguard aspects; (b) the M&E of project activities at baseline, midterm, and end of project, including geotagging of the assets created; (c) stakeholder outreach for awareness on the project; and (d) support for training of PMU staff and staff of the implementing agencies. The Government contribution of US\$0.5 million will cover salary costs of government staff on a parallel basis.

1.4 Objective of the Environmental and Social Management Framework

Projects and Programs financed with IBRD resources need to comply with World Bank Operational Policies. Therefore, all sub-projects and components eligible for funding under IWWRMP will comply with the World Bank's safeguard policies, in addition to conformity with environmental legislation of the Government of Sri Lanka (GOSL). Since details of sites and specific interventions for sub-projects under components 1 and 2 are not available at this stage and will only be finalized during implementation, site specific Environmental and Social Assessments (EA and SA) cannot be conducted. Therefore, the preparation of this document has been undertaken where only generic issues that are typically associated with the type of subprojects proposed will be discussed along with recommendations safeguard procedures to be applied to the project during implementation. Site specific safeguard instruments to be applied to subprojects will be determined as and when they become technically ready for implementation.

The main purpose of this document is to (a) carry out a generic assessment of anticipated environmental and social impacts from IWWRMP and (b) outline a framework for environmental and social screening, assessment and management, giving details of potential environmental and social issues, screening criteria and guidelines on what type of environmental and social tools need to be applied for the various investments prior to commencement of activities. It is expected that detailed environmental and social assessments for sites and/or for activities will be carried out (in accordance with this Framework) by the implementing agencies and will be reviewed and cleared by the Central Environmental Authority (CEA) where applicable, or any other agency, as applicable, under prevailing national environmental legislation in Sri Lanka. In addition, for all

physical activities, prior to the approval of disbursement of funds, the World Bank will also clear all safeguards documentation including site specific EAs and EMPs.

As stated earlier, this document is being submitted in lieu of a project environmental and social assessments and has formed the basis for appraising the environmental and social aspects of the project. It will be made available for public review and comment in appropriate locations in Sri Lanka and in the World Bank's external website in accordance with World Bank's policy of Access to Information.

The ESMF for IWWRMP will cover the following areas:

- i. Description of the proposed project area in terms of key physical, hydrological and biological features
- ii. Applicable national legislations and World Bank safeguard policies
- iii. Generic early assessment of anticipated environmental and social impacts from IWWRMP
- iv. Establishment of clear procedures and methodologies for environmental and social screening, planning, reviewing, approval and implementation of subprojects
- v. Identification of appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and social concerns related to subprojects
- vi. Identification of training, capacity building and technical assistance needed to successfully implement the provisions of the ESMF
- vii. Practical resources for implementing the ESMF

1.5 Due Diligence Principles

This ESMF considers and incorporates principles of due diligence that will be applied during project preparation and implementation in managing potential environmental and social risks that may be encountered. The key due diligence principles are as follows:

Principle 1: Review and Categorization. All physical interventions will be subject to a social and environmental review and shall be categorized based on the magnitude of potential impacts and risks in accordance with environmental and social screening criteria.

Principle 2: Environmental Assessment. As per the GoSL regulatory requirements, where necessary Initial Environmental Examination (IEEs) or Environmental and Social Impact Assessments (ESIAs) will be undertaken to address, as appropriate, the relevant social and environmental impacts and risks. The Assessment will also propose mitigation and management measures relevant and appropriate to the nature and scale of the proposed project as described earlier.

Principle 3: Applicable Environmental and Social Policies, Guidelines and Standards. The ESMF will refer to the applicable World Bank Operational Policies and Environmental Health and Safety (EHS) Guidelines, as well as policies and standards of the GoSL. The Assessment will establish the project's overall compliance with, or justified deviation from, the respective World Bank Operational Policies, Performance Standards and EHS Guidelines where applicable. The Assessment will address compliance with relevant Sri Lankan laws, regulations and permits that pertain to social and environmental matters.

Principle 4: Environmental and Social Management System. For all physical activities, an Environmental and Social Management Plans (ESMPs) and monitoring indicators will be developed which addresses the relevant findings, and draws on the conclusions of the assessments. The ESMPs will describe and prioritize the actions needed to implement mitigation measures, corrective actions and monitoring measures necessary to manage

the impacts and risks identified in the assessments. These actions will be costed and reflected as part of the contractual documents of the civil works contracts.

Principle 5: Consultation and Disclosure. For all activities affected communities will be consulted within a structured and culturally appropriate manner. If principle project activities or subproject activities are assessed to have significant adverse impacts on affected communities, the process will ensure their free, prior and informed consultation as a means to establish whether those activities have adequately incorporated affected communities' concerns. In order to accomplish this, this framework as well as all other safeguard instruments will be made available to the public by the borrower for a reasonable minimum period. The process will be documented, and account will be taken of the results of the consultation, including any actions agreed resulting from the consultation. For projects with adverse social or environmental impacts, disclosure will occur early in the assessment process, and on an ongoing basis.

Principle 6: Grievance Redress Mechanism. To ensure that consultation, disclosure and community engagement continues throughout project implementation, a grievance redress mechanism will be established, scaled to the risks and adverse impacts of the project or subproject, as part of the management system. The grievance redress mechanism will allow for concerns and grievances about the project's social and environmental performance raised by individuals or groups from among project-affected communities to be received and to facilitate resolution of those concerns and grievances.

Principle 7: Monitoring and Reporting. All ESMPs will be monitored based on the monitoring schedule identified in the ESMP by the relevant responsible party. The Environmental and Social Specialists of the Project Management Unit (PMU) will be responsible to ensure the monitoring activities have taken place including their monitoring and consolidate monitoring report is prepared bi-annually.

Principle 8: Training. Training to ensure project staff, staff of civil contracts and other parties who would play a role in managing environmental and social impacts will be necessary to ensure successful implementation of this ESMF. Necessary budget should be allocated to carry out the training plan.

Chapter 2: Policy, Legal and Administrative Framework

2.1. Overview of Environmental Legislation

The constitution of the Democratic Socialist Republic of Sri Lanka under chapter VI Directive Principles of State policy and Fundamental duties in section 27-14 and in section 28-f proclaim “The state shall protect, preserve and improve the environment for the benefit of the community”, “The duty and obligation of every person in Sri Lanka to protect nature and conserve its riches” thus showing the commitment by the state and obligations of the citizens.

The overall environmental concerns are addressed by the National Environmental Act No. 47 of 1980 (and subsequent amendments by act no 56 of 1988 and act no 53 of 2000). It is the umbrella legislation for environmental protection in the country. In addition, several other sectoral legislative enactments are in place (see section below). The national organization that has the mandate to protect and take measures to safeguard the environment is the Central Environmental Authority. It currently operates in the entire country except in the North Western Provincial Council (NWPC), where the NWPC has enacted a separate statute under the 13th amendment to the Constitution of Sri Lanka and had created a separate provincial institute.

There are several other key national agencies with a mandate for environmental management and protection. The Forest Department, the Department of Wildlife Conservation, Department of Archeology, Department of Coast Conservation, Disaster Management Center and Geological Survey and Mines Bureau have their regional offices and staff to cater to and monitor the environmental safeguards as per the policies and regulations governing them. In addition, there are several national agencies that are impacting on the environment and adopting environmental safeguards as well.

The Local Authorities (LA) also has provisions under their respective acts to safeguards and provides useful facility and maintains the same for the convenience of the public in their respective areas. The Municipal Council (MC) Act No. 19 of 1987 & Urban Council (UC) Act No. 18 of 1987 provide for the establishment of MCs and UCs with a view to provide greater opportunities for the people to participate effectively in the decision making process relating to administrative and development activities at a local level and it specify the powers, functions and duties of such LAs and provide for matters connected therewith or incidental thereto. These acts contain sixteen and eight parts respectively, several schedules and 327 & 249 sections respectively. The MC act, spell out its status, powers & functions in Section IV, Section V and Section VI in sections 34 to 154 and covers public health, drainage, latrines, unhealthy buildings, conservancy & scavenging, nuisance etc. Further the respective local authorities have mandate regionally to implement the project activities and monitor the progress of compliance work.

2.2 Detail Review of Key Environmental and Water Resources Related Legislation

2.2.1 The Constitution of Sri Lanka & the 13th Amendment.

The Constitution of Sri Lanka contains several provisions, relating to the environment 9 Article 27 (14) and article 28 (f). The 13th amendment to the constitution introduced a new level of institution for environmental protection and management. Therefore, the provincial government also has legislative and executive power, the North Western Provincial Environmental Authority to control, prevent and monitor all environmental related activities.

Application to IWWRMP: Overall responsibility of individuals and organizations to protect and conserve the natural environment. All project proponents/ implementers and public are responsible.

2.2.2 Environmental Policy of Sri Lanka

The policy emphasizes that environmental sensitivity is an obligation of any institution, government or non-government, and of any individual of Sri Lanka that uses or carries out any activity that has an impact on environmental resources. All are required to exercise due care to avoid environmental degradation.

The policy objectives are:

- To promote the sound management of Sri Lanka's environment in its entirety without compromise, balancing the needs for social and economic development and environmental integrity, to the maximum extent possible while restricting inimical activities.
- To manage the environment by linking together the activities, interests, and perspectives of all groups, including the people, nongovernment organizations (NGOs) and government at both the central and the local levels.
- To assure environmental accountability.

The policy principles are:

- The guiding principles of environmental management will be "polluter pays" and the need to reduce consumption, and recycle and reuse materials to the maximum extent possible.
- When living natural resources are used, it will be ensured that such use is wise, sustainable, and consistent with the integrity of ecosystems and evolutionary processes.
- When non-living resources are used, it will be ensured that such use is consistent with environmental best-practice, bearing in mind the need to provide also for future generations.
- Traditional knowledge and practice will be respected in the development of environmental management systems.
- Effective governance will be ensured through the decentralization of environmental management services to the maximum extent possible.

The policy statements are:

- Resources such as land, water, air, minerals, and biodiversity will be managed in a manner consistent with the viability of ecological processes.
- Environmental management will be through participatory, transparent, predictable and accountable decision-making processes at all levels.
- In addition to protecting the environment from abuse, management systems will take into account the need to restore environments damaged in the past.
- Environmental management systems will be encouraged to be flexible so as to adapt to changing situations and adopt the precautionary principle.
- The economic value of environmental services will be recognized so as to assure the sustainability of such services for the benefit of the people.
- The state of the environment will continuously be assessed and reported on, through an appropriate institutionalized monitoring framework based on a comprehensive set of indicators
- The institutional framework for sound environmental management will be strengthened through capacity building, legislative enactments and improved inter-institutional coordination and linkages.
- "Life cycle" and "cleaner production" principles will be applied to improve the efficiency of natural resource use and to improve environmental quality.

Application to IWWRMP: Will be applicable across the project as it declares the requirement for environmental safeguards in managing water resources, adoption of participatory approaches in preparation of the management plans and looks at balancing the ecological services and economic service provision that can be obtained from the environment to support people.

2.2.3 The National Environmental Act. No. 47 of 1980 & its amendments

The National Environmental Act (NEA) provides conservation and development guidelines for natural resources including water, soil, fisheries resources, forest, flora and fauna in Sri Lanka. It also paved the way for the creation of the Central Environmental Authority (CEA). Further it spells out the creation of an Environmental Council in collaboration with the respective line agencies to advise the CEA (Section 7) and provide necessary guidelines to establish District Environmental Agency under the chairmanship of the District Secretary. The NEA is the basic national decree for environmental protection. The three main regulatory tools implemented under the NEA are Environmental Impact Assessment/Initial Environmental Examination, Environment Protection License (EPL) and Schedule Waste Management License supported by standards for discharge and waste disposal guidelines.

The first regulatory tool is for environmental assessment of development projects. All projects get categorized into either prescribed or non-prescribed projects where only prescribed projects will be subjected to environmental impact assessment. A comprehensive description of EIA/ IEE process is given in the Annex 2. It is the key regulatory tool enabling any developer to implement the development activity in line with the NEA and thereby assuring the long term sustainability of the development undertaken while paying due respect to the environment.

The second regulatory tool under the provisions of the National Environmental Act is the Environmental Protection License (EPL). The EPL procedure has been introduced to prevent or minimize the release of discharges and emissions into the environment from industrial activities in compliance with national discharge and emission standards, to provide guidance on pollution control for polluting processes and to encourage the use of pollution abatement technology such as cleaner production, waste minimization etc. Here the industries are classified into three lists named A, B and C. List A is comprised of 80 potentially high polluting industries, List B is comprised of 33 medium polluting industries and List C is comprised of 25 low polluting industrial activities. The operational details are given in CEA website (www.cea.lk).

The third regulatory tool deals with the disposal of scheduled waste. The gazette notification No 1534/18 of 1st February 2008 made by the Hon. Minister under section 23A and 23B of the National Environmental Act No. 47 of 1980 is referred to as the National Environmental (protection & quality) regulations No. 1 of 2008. It deals with waste from specific and nonspecific sources. The notification has three parts and eight schedules. The Part I deal with the Issue of Environmental protection License for Emission of Disposal of waste. Part II deals on issue of license for the management of scheduled waste (Hazardous Waste) and Part III on General matters including definitions and the effectiveness and validity of the license issued under National Environment (protection & quality) regulation No 1 of 1990 published in extraordinary gazette No 595/16 of February 1990. The eight schedules include the tolerance limits, applications, formats for reporting, categorization of nonspecific and specific waste etc.

The 1994 amendment delegated the authorization to the local authorities to issue EPL for low polluting industries. The CEA's environmental management functions are holistic and they are very well set out in section IV of the act. Along with the EPL procedures several standards also have been gazetted with regard to disposal of effluents to land and water bodies.

Application to IWWRMP: Since the investment packages and the interventions under each of the components are yet to be identified through initial assessments as the preliminary part of the project, the level of environmental assessment required at this stage is not clear. Therefore, each subproject should be screened within the scope of the NEA and the required level of environmental assessment adopted. In addition, the World Bank safeguards policies will be applicable.

2.2.4 The North Western Provincial Environmental Statute No. 12 of 1990

Provincial Environmental Act (PEA) of 1991 implemented by the North Western Provincial Council applies for areas coming under the North Western Province. Environmental Assessments are required for prescribed projects that have been gazetted in Gazette Extraordinary 1020/21 of 27th March, 1998. It specifies two lists of project types (a) where EIA/IEE is mandatory and (b) where the EA can be requested if the PAA decides so. The process is similar to that of the NEA and will be headed by one of the two listed PAAs; (a) Provincial Environmental Authority or (b) Provincial Ministry of Fisheries and Aquaculture.

Application to IWWRMP: Similar to regulations applicable under the NEA. In areas of the North Western Province, this Act will supersede the NEA if it is not an area under the DWLC or CCD.

2.2.5 State Land Ordinance Act No 13 of 1949

The State Lands Ordinance provides necessary guidelines to:

- The protection of the source, course or bed of any public stream
- The protection of springs, reservoirs, lakes ponds lagoons, creeks, canals, aqueducts etc.
- The construction or protection of roads, paths, railways and other means of internal communication.
- The prevention of the erosion of soil.
- The preservation of water supplies.

In addition, section 75 of the State Land Ordinance highlights on riparian proprietors activities. The occupier of land or the bank of any public lake or public stream shall have the right to use the water in that lake or stream for domestic purpose and shall not be diverted through a channel, drain or pipe or by means of a pump or other mechanical contrivance but shall be removed in a bucket or other receptacle.

Application to IWWRMP: This has significant implication and relevance to all the water bodies that will come under the project for improvements of the watershed areas, rehabilitation works on reservoirs, dams and canal system. Some of the project interventions support the mandate of this act by ensuring the protection and preservation of the canals and its banks, prevention of erosion, preservation of water supplies, etc.

2.2.6 The Coast Conservation Act No. 57 of 1981 amended by Act No. 64 of 1988

The Coast Conservation Act (CCA) makes provisions for the regulation and control of development activities within the coastal zone as well as formulates and executes schemes of work for coast conservation. Under the section 6 of the act, there is provision to appoint a Coast Conservation Advisory Council (CCAC) which would advise the Coast Conservation Department on all development activities proposed to be implemented in the coastal zone and review its coastal zone management plans. The law specifies that projects located wholly or partly within the coastal zone (the area lying within a limit of three hundred meters landwards of the Mean High Water line and a limit of two kilometers seawards of the Mean Low Water line and in the case of rivers, streams, lagoons, or any other body of water connected to the sea either permanently or periodically, the landward boundary shall extend to a limit of two kilometers measured perpendicular to the straight base line drawn between the natural entrance point thereof and shall include waters of such rivers, stream and lagoons

or any other body of water so connected to the sea) must undergo the approval process that is laid down in the Coast Conservation Act irrespective of its size.

Only those projects located totally outside the Coastal Zone will be subject to the approval process laid down in the National Environmental Act. Therefore, any development work taking place within this zone falls under the jurisdiction of CCD. According to the CCA, Director of the CCD has the discretion to request for an EIA/IEE from the project proponent if the initial screening reveals significant impacts in the coastal areas by the project. The process is very much similar to the NEA excepting that the Director of the CCD reserves the right to request for an EIA/ IEE depending on the nature and scale of anticipated impacts of the proposed investments rather than on predetermined prescribed limits as in the NEA and also to make a final decision. The Director is advised by the CCAC on the findings of EIA/ IEEs.

Application to IWWRMP: The application of this regulation to IWWRMP is limited at this stage.

2.2.7 The Flood Protection Ordinance Act No. 22 of 1955

This act provides room for the Minister to declare any area in the country as flood area. It has provisions to prepare scheme for protection of flood area, creation of flood authority, regulations for management of flood area and acquisition of land for the purpose of the ordinance. The flood authority is usually the District Secretary of the affected area. In case of a large area of a Municipality is coming under flood the Minister may substitute the District Secretary by appointing the Mayor of the Municipality.

Application to IWWRMP: Applicable because flood mitigation is one of the objectives of this project in adapting to climate change. The project considers increasing groundwater recharge and increasing catchment productivity.

2.2.8 The Fauna & Flora Protection Ordinance Act No. 49 of 1993 & its amendments

This act provides the protection, conservation and preservation of the fauna and flora of Sri Lanka. Under the Fauna and Flora Protection Ordinance (FFPO), five categories of protected areas are established viz. Strict Nature Reserves, National Parks, Nature Reserves, Jungle Corridors and Intermediate Zones including sanctuaries. According to this Act, any development activity of any description what so ever proposed to be established within a national reserve or within one mile from the boundary of any national reserve, is required to be subjected to EIA/IEE, and written approval should be obtained from the Director General, Department of Wildlife Conservation prior to implementation of such projects. The FFPO follows a similar process as the NEA in conducting scoping, setting the TOR, preparation of EA, review of EA and public consultation and disclosure. The decision of project approval or disapproval is finally granted by the Director General of the Department of Wildlife Conservation.

There are many conservation areas within the projects area of influence including Peak Wilderness, Horton Plains National Park.

2.2.9 Forest Ordinance 1907 (No. 16 of 1907) as amended up to 2009

Is an ordinance to consolidate and amend the law relating to the conservation, protection and sustainable management of the forest resources and utilization of forest produce; to provide for the regulation of the transport of timber and forest produce and other activities related to such transport; and to provide for matters connected therewith or incidental thereto. The Forest Reserves gazetted under the provisions of the ordinance and all proposed reserves that are not gazetted under these provisions but selected for

conservation based on biological and hydrological importance should be taken into account in implementation of this project.

Application to IWWRMP: Project will directly impact on the forested areas of the watershed and river basins. There may be negative impacts involving clearance of trees to accommodate trans-basin water transfers and activities being carried out in or around the buffer areas.

2.2.10 Irrigation Ordinance (Chapter 453)

The ordinance in its part VI covers the protection of irrigation works and conservation of water in section 64. The section 65 deals with removal of encroachments. The Part V covers the construction and maintenance of major and minor irrigation schemes in sections 33, 34, 46, 54, 61, 62 and 63.

Application to IWWRMP: Will be directly relevant under Component 2 as Irrigations Department will be an implanting Partner and will involve rehabilitation of irrigation canals.

2.2.11 National Wetland Policy

The National Policy & strategies on Wetlands (2005) seeks to give effect to National Environment Policy and other relevant national policies, while respecting national commitments towards relevant international conventions, protocols, treaties and agreements on wetland protection to which Sri Lanka is a party. Among the International Conventions, Ramsar Convention on Wetlands of International Importance (1971), the Convention on Conservation of Migratory Species of Wild Animals (1979) and the Convention on Biological Diversity (1992) are significant.

The definition given for Wetlands in the policy is “Areas of marsh, fen, peat land or water, where natural or artificial, permanent or temporary with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters and may incorporate riparian and coastal zones adjacent to the wetlands and islands or bodies of marine water deeper than six meters at low tide within the wetlands”.

The policy has six sections, Introduction, need for a national policy on wetlands, principles, objectives, policy directions and explanation of key concepts. The policy directions address wetland management, institutional arrangement, inter-sectoral linkages, research, development and education. The local level and national level institutions are proposed to be established. All sectoral development plans should be based on principles of wetland ecosystem management.

Institutional Arrangement to manage wetlands is well established at present. A multi- stakeholder National Wetland Steering Committee has been established in the Ministry of Environment to advise on wetland issues in the country and wetland management unit has been set up at the Central Environmental Authority to oversee and facilitate policy implementation.

Application to IWWRMP: Project interventions impact directly on wetlands and impacts on any migratory bird species will have to be considered if found necessary during EAs for the timing of the rehabilitation work. Any impacts to these areas will be identified in the respective project specific screening and EAs.

2.2.12 Mahaweli Authority of Sri Lanka Act (Act No.23 of 1979)

This act established the Mahaweli Authority of Sri Lanka, which is the authority responsible for the implementation of the Mahaweli Ganga Development Schemes including the construction and operation of reservoirs, irrigation distribution systems and installations for the generation and supply of electrical energy.

Further, the functions of the authority include fostering and securing the full and integrated development of any special area, conservation and maintenance of the physical environment within any special area, optimizing agricultural productivity, employment potential and generation and securing economic and agricultural development within any special area, promotion and securing the co-operation of Government Departments, State Institutions, Local Authorities, public cooperation and other persons, whether private or public, in the planning and implementation of the Mahaweli Ganga Development Schemes and in the development of any special area etc.

Application to IWWRMP: All interventions under Component 1 will be subject to this act and will have to adhere to the guidelines. This is not seen as a problem area as the interventions will be implemented by the Mahaweli Authority itself.

2.2.13 Soil Conservation Act 1951 (No. 25 of 1951)

The Act aims at the conservation of soil resources for the prevention or mitigation of soil erosion and at the protection of land against damages by flood and drought. On the basis of surveys and investigations carried out by the Director of Agriculture for the purposes of ascertaining the nature and extent of soil erosion and of damages to land caused by floods and drought, the Minister may by Order published in the Gazette declare any area to be an erodible area.

Application to IWWRMP: One of the main aims of Component 1 is to minimize soil erosion, so the involvement of Agriculture Department will be essential in especially severely degraded areas.

2.2.14 Mines and Mineral Act No. 33 of 1992

The Geological Survey and Mines Bureau established under the Mines and Minerals Act No. 33 of 1992. Under this act, mining falls within the purview of the Geological Survey and Mines Bureau (GSMB). Mining and exploitation for minerals, including sand, must be licensed under the act by the GSMB. Mining licenses are issued only to a qualified individuals and companies registered to do business in Sri Lanka. Mining is not permitted within Archaeological Reserves and within specified distance of monuments. New mining licenses are subject to the EIA process, if the type and extent of mining is listed under the EIA regulations. Additionally, the GSMB has power to stipulate conditions including the taking of deposits and insurance for the protection of environment. Regulations made by the GSMB under the act cover a variety of environmental stipulations, criteria and conditions for licensing and operating mines.

This also covers the disposal of mine wastes. The act also deals with the health, safety and welfare of miners. Reclamation of mines is a major problem in Sri Lanka and due to current practice requires the mining enterprise to make a deposit to cover costs of recovery. The deposit however is inadequate for the purpose. Large extents of mined areas, particularly areas mined for clay and sand remain open. Mining rights on public and private land are subject to licensing by the GSMB and all minerals wherever situated belonging to the state. The right to mine particular parcels of public lands may be subject to EIA procedures as well as to lease for permit conditions.

Application to IWWRMP: Earth and quarry material will be needed for the rehabilitation and development work undertaken by the respective implementing agencies either directly or through contractors. In such cases quantities specified need to be extracted and permission from the GSMB is required. Alternatively, the project contractors can procure the material from the open market but they will have to make sure that such sources/traders are operating with valid licenses.

2.2.15 Local Authorities acts The Municipal Council (MC) Act No. 19 of 1987 & Urban Council (UC)

Act No. 18 of 1987 provide provisions for the establishment of MCs and UCs with a view to provide greater opportunities for the people to participate effectively in decision making process relating to administrative and development activities at a local level and it specify the powers, functions and duties of such LAs and provide for matters connected therewith or incidental thereto. These acts contain sixteen & eight parts respectively, several schedules and 327 & 249 sections respectively. The MC act, spell out its status, powers & functions in Section IV, Section V and Section VI in sections 34 to 154 and covers public health, drainage, latrines, unhealthy buildings, conservancy & scavenging, nuisance etc. Further the respective local authorities have mandate regionally to implement the project activities and monitor the progress of compliance work.

Application to IWWRMP: The infrastructure improvement sub projects funded under IWWRMP through the LAs comprise of the basic services they ought to render to the public in line with these acts. Subsequently maintaining this infrastructure would be the prime duty of the local authorities. Also they will be required for the disposal of waste generated during project activities.

2.2.16 Urban Development Authority Act No. 41 of 1978

This act has provided provisions to establish the Urban Development Authority, declaration of areas as urban development area. Its Part II outlines 22 point powers and functions of the UDA. Under Part IV it has power to acquire immovable property and sale of land belonging to the authority. The act provides room to make regulations for the purpose of carrying out or giving effect to the principles and provisions of this law. The amendment brought in Act no 2 of 1980 under special provisions provided room to declare lands urgently require for urban development projects and remedies to affected parties and the uphold the power of Supreme court. The amendment brought under Act No 4 of 1982 in its Part IIA describes the planning procedure, appointment of planning committees, preparation of draft development plans, approval of the same also provide room for subsequent amendment. It also provides room to issue permits for development work, and delegation of the powers of the authority and procedures to be followed if activity takes place in contrary to the permit issued. Further the principle enactment amended by the addition of section 29 by adding a schedule, indicating the matters for which provisions may be made in the development plan. The subsequent amendments deal with levies, joint venture development projects etc.

Application to IWWRMP: Will have to obtain concurrence with UDA if any interventions have to go through any of the cities.

2.2.17 Antiquities Ordinance

The Antiquities Ordinance of (Revised in 1956 & 1998) is the main legislation dealing with Cultural Asset Preservation in Sri Lanka. Section 16 covers Ancient Monuments and their declaration as well as the declaration of specified trees as ancient monuments. According to Section 21, the restoration, repair, alteration or addition in connection with any protected monuments has to be conducted in accordance with the conditions of a permit issued by the Director General of Archaeology, or in accordance with an agreement entered in to under Section 20. Section 24 prohibits or restricts subjects to certain prescribed conditions, the erection of buildings or carrying out mining, quarrying, or blasting operations on any land within the prescribed distance of any ancient monument situated on Crown land or any protected monument. As per the ordinance the Director general of Archaeology “shall cause an impact assessment survey to be undertaken at the expense of the sponsors of such project or scheme to assess the consequences thereof upon the antiquarian, historical or archaeological aspects or value of the land in question or on any antiquities upon it and shall, within such period of time as may be agreed on.

Application to IWWRMP: The project's area of influence will include areas of archeological importance and monuments. Necessary clearances and permits will be obtained from the Department.

2.2.18 Occupational Health and Safety

Project interventions involve multifarious activities during construction and operation and maintenance phases. These activities are also associated with problems of occupational health and safety. The problems envisaged during construction and erection stages can mainly be due to exposure to dust, accidents and noise. The problems envisaged during the operation and maintenance phase are accidents, exposure to heat, noise, arc lights, chemicals etc.

The National Policy on Occupational Safety and Health in Sri Lanka is in the drafting stage. The Labour and Labour Relations Ministry in collaboration with 25 ministries, trade unions, employers and other authorities are involved in the drafting with the intention of reducing work place related injuries and other mishaps (Ceylon Daily News; 14th November 2014).

Application to IWWRMP: All project activities, during construction should comply with Factory Ordinance requirements related to occupational, health and safety and International Labour Organization (ILO) guidelines on the same.

2.2.19 Institutional and legal framework for land acquisition and involuntary resettlement

Under the IWWRMP, land acquisition /transfer of state land may occur in unproductive areas however, involuntary resettlement is not anticipated. However, all relevant regulations including the following are discussed in detail in the RPF prepared for IWWRMP:

- The Land Acquisition Act No. 9 of 1950 25
- The Land Acquisition Regulations of 2008 26
- The Land Development Ordinance No. 19 of 1935 26
- The State Lands Act No. 13 of 1949 27
- The State Lands (Recovery of Possession) Act No. 7 of 1979 27
- The Crown Lands Ordinance 28
- Prescription Ordinance No. 22 of 1971 28
- Land Settlement Ordinance No 20 of 1931 and subsequent amendments 28
- Land Commissioner General's Circular 2014/02 29
- National Environmental Act No. 47 of 1980 29
- Sri Lanka Land Reclamation and Development Corporation Act No. 15 of 1968 30
- Temple and Devalagam Act 30
- Estates (Control of Transfer and Acquisition) Act (No. 2 of 1972)

2.3 Summary of Institutions directly involved in IWWRMP and their Mandates

Institute	Mandate
Watershed Management	
Mahaweli Authority of Sri Lanka	The Mahaweli Development Authority 's current task is to implement the envisaged project plan in the balance areas proposed by the Master plan and also Gazetted areas. This includes

	rehabilitating and maintenance of the irrigation network, administration of the land, enhancing the production of agriculture and the post settlement process. Further, MASL is responsible for managing irrigation water for 101,526 ha. of Irrigable land in the dry zone. Any project based development that is located in declared Mahaweli area requires approval from Mahaweli Authority.
Forest Department	Its functions are organized under six technical divisions: Forestry Inventory and Management, Environment Management, Social Forestry and Extension, Research and Education, Forest Protection and Law Enforcement, and Planning and Monitoring. The functions of the department are largely governed by the Forest Ordinance and the National Heritage and Wilderness Areas Act. Forest areas administered by FD include forest reserves, conservation forests, multiple use forests, sparse forests, mangroves and plantations.
Central Environmental Authority	<p>The Ministry of Environment and Wildlife resources has overall responsibility in the affairs of the CEA with the objective of integrating environmental considerations in the development process of the country. The CEA has been given wider regulatory powers under the NEA through its amendment No 56 of 1988 and Amendment Act No 53 of 2000.</p> <p>Environment Protection licensing (EPL) process for industries, EIA/IEE, issuing of environmental recommendations and site clearances, Environmental Education and Awareness, Scheduled Waste Management Licensing, responding to public complaints related to environment and environmental monitoring are the main services of the CEA. The subject of Environment is a devolved subject while the central government also has controlling powers since the subject is a concurrent subject.</p> <p>A large number of institutions with responsibility for environmental management and protection have either direct or indirect responsibility in protection of the environment in the project areas. Some of these institutions include the following</p> <ol style="list-style-type: none"> 1. Department of Forest Conservation 2. Department of Wildlife Conservation 3. Local Authorities 4. Department of Fisheries and Aquatic Resources 5. Department of Archeology 6. Urban Development Authority 7. Geological Survey and Mines Bureau 8. Sri Lanka Land Reclamation and Development Authority 9. National Water Supply and Drainage Board 10. Water Resources Board <p>All though the above mentioned institutions have responsibilities to protect the environment of the basin area, the Central Environment Authority (CEA) is the national level agency for environmental management and protection.</p>

Ministry of Sustainable Development	<ul style="list-style-type: none"> • Preparation, monitoring and assessing of policies, programs and projects related to the subjects of sustainable development, wildlife, botanical gardens and zoological gardens. • Implementation of the Fauna and Flora Protection Ordinance no. 02 of 1937. • Implementation of the Botanical Gardens Ordinance no. 31 of 1928. • Implementation of the National Zoological Gardens Act no. 41 of 1982. • Preparation of sustainable measurements and environmental indicators. • Conservation of the flora of Sri Lanka, maintenance of the botanical gardens in Sri Lanka and development of the floriculture in Sri Lanka. • Collecting and exhibition of mammals, birds and reptiles in Sri Lanka. • Conservation of wildlife resources in Sri Lanka • Having necessary measures to conserve environment in promoting eco-tourism in wildlife reserve areas • Handling and supervision of the activities related to the Wildlife Trust, Wildlife Conservation Fund, Zoological Gardens conservation Fund, Botanical Gardens Trust Fund
Department of Agrarian Development	Improvement to Diversion systems (Anicut) in bog half bog soils in the low country wet zone with Gabion Technology. Obtain clearance if any development activities are located within a paddy lands. Governs water allocation for agricultural fields.
Land Reforms Commission	Utilization of lands vested in the Land Reform Commission in productive investments in accordance with the provisions stipulated in the act and policies made by the government with a view to achieve economic and social development of the country. ownership in terms of the provisions of the Land Reform Act.
Ministry of Lands	The mandate of the Ministry of Lands, Housing and Urban Development (MLHUD) is “policy making, standards setting, national planning, regulation, coordination, inspection, monitoring and back-up technical support relating to lands, housing and urban development; promoting and fostering sustainable human settlement; and, managing works on government buildings” in the country.
Infrastructure Improvements	
Mahaweli Authority of Sri Lanka	The Mahaweli Development Authority 's current task is to implement the envisaged project plan in the balance areas proposed by the Master plan and also Gazetted areas. This includes rehabilitating and maintenance of the irrigation network, administration of the land, enhancing the production of agriculture and the post settlement process. Further, MASL is responsible for

	managing irrigation water for 101,526 ha. of Irrigable land in the dry zone. Any project based development that is located in declared Mahaweli area requires approval from Mahaweli Authority.
Irrigation Department	Enhance the development and management of land and water resources towards the socio-economic development of Sri Lanka. Irrigation Department will plan out. Design, control and manage land and water resources to derive optimum benefits for Irrigated agriculture, Hydro power and Flood control by harmonizing the modern technologies and human resources. The Divisional Irrigation Engineers are responsible for the operation, maintenance and improvement of irrigation, drains and flood protection for each division under their purview. The Director Irrigation of the district coordinates the functions of the divisions.
Ministry of Mahaweli, Agriculture, Irrigation and Rural Development	Development interventions proposed to be carried out in and around Mahaweli Development area should obtain consents from Mahaweli Authority of Sri Lanka as per the Act. As of now there are no sub-projects identified that fall within this area. Develop policy on irrigation. Department of irrigation falls under this ministry where projects will be developed to mitigate certain issues of water resource management. Manage and provide assistance resilience to mitigate disaster associated with floods and cyclones.
Department of Archeology	Project interventions that will require further feasibility studies and will be selected for potential financing in the later known and demarcated sites of archeological and cultural significant. Specific measures to ensure chance find physical cultural resources are managed accordingly as per this ordinance, are embedded in to project environmental due diligence procedures
Strengthening Institutions for River Basin Management	
Ministry of Mahaweli, Agriculture, Irrigation and Rural Development	Plays key role to protect the environment and provides necessary guidelines for the protection of human life, property and the environment of the country. Major functions of the NCDM include, to formulate a National Policy and Program on the management of disasters, maintenance and development of disaster affected areas; the effective use of resources for preparedness prevention, response, relief, reconstruction and rehabilitation; and provide public awareness and training. The main functions of the ministry include <ul style="list-style-type: none"> • Formulation & Execution of Policies, Programs and Projects related to the Ministry and institutions Comes under the Ministry purview • Development Water Resources and Irrigation Facilities • River Basins and Irrigation Systems Management Including Operation and Maintenance • Conservation and Protection of Water Sources and Irrigation Systems • Bulk Water allocation for Multiple Uses

	<ul style="list-style-type: none"> • Control of Pollution of Water sources and ensure quality of Water • Prevention of Salt Water Extrusion to inland areas. • Drainage and Flood Protection • Engineering Consultancy Services • Institutional Development and Productivity Enhancement of Irrigation systems • Development, Monitoring and Management of Ground Water • Conservation of Rain Water and promoting Rain water harvesting program
Irrigation Department	Preparation of Master plan for development of the different river basins for the optimum utilization of land and water resources. Project formulation and detail designs of Irrigation, Hydro-power, Flood control and Reclamation Projects. Construction of Irrigation and Settlement Projects for the conservation, diversion and distribution of water under gravity and lift Irrigation to new and existing lands for cultivation by farmers for food crop production.
Water Resources Board	WRB responsible for groundwater resources in the country is weak in implementation. Empowerment of Authority is expected through the project.
Mahaweli Authority of Sri Lanka	The Mahaweli Development Authority 's current task is to implement the envisaged project plan in the balance areas proposed by the Master plan and also Gazetted areas. This includes rehabilitating and maintenance of the irrigation network, administration of the land, enhancing the production of agriculture and the post settlement process. Further, MASL is responsible for managing irrigation water for 101,526 ha. of Irrigable land in the dry zone. Any project based development that is located in declared Mahaweli area requires approval from Mahaweli Authority. As of now there are no sub-projects identified that fall within this area.

2.4 World Bank Safeguard Policies

2.4.1 Environmental Assessment OP 4.01

Projects and programs funded by IBRD resources need to comply with the World Bank's operational policies. Therefore, all sub-projects eligible for funding under this project will be required to satisfy the requirements of the safeguard policies of the World Bank, in addition to conformity with national environmental regulations. The IWWRMP will undertake varied and many infrastructure rehabilitation and development sub projects that require screening and impact identification. The World Bank OP 4.01 discusses the environment assessment process to be followed.

The WB Safeguard Policies triggered under this project are OP/BP/GP 4.01: Environmental Assessment, OP/BP 4.04: Natural Habitats, OP/BP 4.36: Forests, OP/BP 4.11: Physical Cultural Resources, OP/BP 4.12: Involuntary

Resettlement and OP/BP 4.37: Safety of Dams. Special emphasis should be given to ensure minimum impacts to the natural environment during subproject implementation.

WB Safeguard Policies Triggered by the Project

Safeguard Policies Triggered by the Project	YES	NO
Environmental Assessment (OP/BP/GP 4.01)	X	
Performance Standards for Private Sector Activities OP/BP 4.03		X
Natural Habitats (OP/BP 4.04)	X	
Forests OP/BP 4.36	X	
Pest Management (OP 4.09)		X
Physical Cultural Resources (OP 4.11)	X	
Involuntary Resettlement (OP/BP 4.12)	X	
Indigenous Peoples (OP/BP 4.10)		X
Involuntary Resettlement OP/BP 4.12	X	
Safety of Dams (OP/BP 4.37)	X	
Projects on International Waterways (OP/BP/GP 7.50)		X
Projects in Disputed Areas (OP/BP/GP 7.60)		X

These policies are triggered if a project is likely to have potential (adverse) environmental risks and impacts in its area of influence. The policy requires environmental assessment (EA) of projects proposed for World Bank financing to help ensure that they are environmentally sound and sustainable, and thus to improve decision making. EA should take into account the natural environment, human health and safety and social aspects in an integrated way. It should also take into account the variations in project and country conditions, the findings of country environmental studies, national environmental action plans, the country's overall policy framework and national legislation, the project sponsor's capabilities related to the environment and social aspects, and obligations of the country, pertaining to project activities, under relevant international environmental treaties and agreements.

The pollution prevention and abatement measures and emission levels that are normally acceptable to World Bank is described in the Pollution Prevention and Abatement Handbook. However, taking into account country's legislation and local conditions, the EA may recommend alternative emission levels and approaches to pollution prevention and abatement for the project whichever is more stringent.

Project Categorization

When OP 4.01 is triggered, the World Bank classifies proposed projects into one of four categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts.

(1) A proposed project is classified as Category A if it is likely to have significant adverse environmental impacts that are sensitive, diverse or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works.

(2) A proposed project is classified as Category B if its potential adverse environmental impacts on human populations or environmentally important areas including wetlands, forests, grasslands and other natural habitats are less adverse than those of Category A projects. These impacts are site specific; few if any are irreversible; and in most cases mitigatory measures can be designed more readily than for Category A projects.

The scope of an EA for Category B projects may vary from project to project, but it is narrower in scope when compared with Category A projects.

(3) A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. For example, technical assistance projects on institutional development, computerization, and training fall in Category C.

(4) A proposed project is classified as FI when the Bank provides funds to participating national banks, credit institutions and other financial intermediaries (FIs) for on lending at the FIs' risk to final borrowers.

In the case of such projects, the FI screens each subproject proposed for financing, and classifies it into any one of three categories: A, B or C. FIs must prepare an Environmental and Social Management Framework, following the Bank's consultation and disclosure requirements as in the case of other safeguards documents (e.g., EAs, RAPs, IPPs). The ESMF, including the screening process for categorization of subprojects, must be spelled out in the operational manual.

Classification of Sub Projects (as per WB OP 4.01 Para 8)

Category	Impact	WB requirement
A	Subprojects in the proposed project are characterized creating significant adverse environment impacts, with regard to sensitivity, diversity, irreversibility, and/or unprecedented impacts.	Comprehensive EIA and ESMP
B	Subprojects in the proposed project are characterized being small in volume and size, implying reversible environmental impacts.	Simplified EIA and ESMP
C	Subprojects in the proposed project do not comprise construction works, and do not cause air, soil and water contamination.	No EA required
F1	Proposed Projects that involve investment of bank funds through a Financial Intermediary (FI), in sub projects that may result in adverse environmental impacts	The FI should screen each sub project and ensure that each sub borrower carries out appropriate EA according to sub-project category

Environmental Assessment OP 4.01

Safeguards category: IWWRMP has been placed under environment category B as anticipated impacts are expected to be localized, short-term and mitigatable with known technology. The physical interventions proposed under component 1 and 2 are not expected to generate environmental and social impacts that are significant and irreversible.

In the long run, the project is expected to bring about environmentally and socially beneficial outcomes through improved watershed productivity, dam safety, and increased livelihood opportunities. During the rehabilitation work and potential infrastructure construction stage, project interventions will trigger temporary negative environmental impacts. As mentioned, these will vary in extent, scope and nature

depending on the type of intervention and the topographical setting of the sites. This policy is applicable because the program will support the rehabilitation of existing water management infrastructure across the island as well as undertake planning and prioritizations studies that identify a select set of priority infrastructure projects that will include improvements/rehabilitation to existing structures and the construction of new infrastructure within the water management sector.

Through a project timeline is yet not available, it is expected that Year 1 investments will be fairly straight forward and rather uncomplicated as it will involve mainly feasibility studies for component 1 and dam/irrigation canal rehabilitation of sites with least complications.

Environmental Management Plans According the World Bank OP4.01 (A guide to preparing EMPs is provided in Annex 3), an Environmental Management Plan (EMP) is an essential element of EA reports. The ESMP should consists of a set of mitigation, management, monitoring, and institutional measures to be taken during implementation and operation to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. The plan should also include the actions needed to implement these measures. In preparation of an Environment and Social Management Plan (ESMP), the EA consultant should:

- a. Identify the set of responses to potentially adverse impacts
- b. Determine requirements for ensuring that those responses are made effectively and in a timely manner
- c. Describe the means for meeting those requirements.

2.4.2 Natural Habitats OP/BP 4.04

OP 4.04: Natural Habitats seeks to ensure that World Bank-supported infrastructure and other development projects take into account the conservation of biodiversity, as well as the numerous environmental services and products which natural habitats provide to human society. The policy strictly limits the circumstances under which any Bank-supported project can damage natural habitats (land and water areas where most of the native plant and animal species are still present). Specifically, the policy prohibits Bank support for projects which would lead to the significant loss or degradation of any Critical Natural Habitats, whose definition includes those natural habitats which are either: legally protected, officially proposed for protection, or unprotected but of known high conservation value. In other (non-critical) natural habitats, Bank supported projects can cause significant loss or degradation only when there are no feasible alternatives to achieve the project's substantial overall net benefits; and acceptable mitigation measures, such as compensatory protected areas, are included within the project. Identification and assessing of impacts to natural resources is generally undertaken as part of EA work. Where significant impacts are anticipated special habitat management plans will be required, depending on the circumstances. Also, it is essential to ensure any formal clearances/approvals are taken from relevant government authorities as per National legislations

Many of the countries water management infrastructure is located either within or in close proximity to significant natural habitats or designated areas of natural importance. In addition as sub-project sites are not known there also remain the uncertainty of project locations and their association natural habitats and they can be impacted. Therefore, this policy is applicable.

2.4.3 Forests OP/BP 4.36

The policy objectives are (1) The management, conservation, and sustainable development of forest ecosystems and their associated resources are essential for lasting poverty reduction and sustainable development, whether located in countries with abundant forests or in those with depleted or naturally

limited forest resources. The objective of this policy is to assist borrowers to harness the potential of forests to reduce poverty in a sustainable manner, integrate forests effectively into sustainable economic development, and protect the vital local and global environmental services and values of forests. (2) Where forest restoration and plantation development are necessary to meet these objectives, the Bank assists borrowers with forest restoration activities that maintain or enhance biodiversity and ecosystem functionality. The Bank also assists borrowers with the establishment and sustainable management of environmentally appropriate, socially beneficial, and economically viable forest plantations to help meet growing demands for forest goods and services.

Based on the experience of the establishment of new infrastructure in the country in the recent past, it is expected that potential infrastructure projects can have threats to forests as in many instances raw material such as metal, sand and gravel have been extracted from forest reserves. Therefore, this policy is applicable.

2.4.4 Physical Cultural Resources (PCR) OP/BP 4.11

Cultural resources are important as sources of valuable historical and scientific information, as assets for economic and social development, and as integral parts of a people's cultural identity and practices. The loss of such resources is irreversible, but fortunately, it is often avoidable. The objective of OP/BP 4.11 on Physical Cultural Resources is to avoid, or mitigate, adverse impacts on cultural resources from development projects that the World Bank finances. Identification and assessment of impacts to PCRs is generally undertaken as part of the EA process and any mitigation measures will be included in the ESMPs. Where restoration of heritage assets are undertake, an approved restoration plan will be necessary. Under this policy too it is essential to ensure any formal clearances/approvals are taken from relevant government authorities as per National legislations.

This policy has been triggered because the potential infrastructure projects under the program may be located in close proximity to designated physical cultural resources and cultural heritage sites as the country's historic cascading earthen tank system itself are sites of national cultural significance.

2.4.5 Indigenous People OP/BP 4.10

This policy contributes to the Bank's mission of poverty reduction and sustainable development by ensuring that the development process fully respects the dignity, human rights, economies, and cultures of Indigenous Peoples. For all projects that are proposed for Bank financing and affect Indigenous Peoples,³ the Bank requires the borrower to engage in a process of free, prior, and informed consultation.⁴ The Bank provides project financing only where free, prior, and informed consultation results in broad community support to the project by the affected Indigenous Peoples.⁵ Such Bank-financed projects include measures to (a) avoid potentially adverse effects on the Indigenous Peoples' communities; or (b) when avoidance is not feasible, minimize, mitigate, or compensate for such effects. Bank-financed projects are also designed to ensure that the Indigenous Peoples receive social and economic benefits that are culturally appropriate and gender and intergenerationally inclusive. There are no conclusive evidence pointing to indigenous people living within the potential project area however, since exact project areas are yet unknown, this policy is triggered till confirmed.

2.4.6 Involuntary Resettlement OP/BP 4.12

Bank experience indicates that involuntary resettlement under development projects, if unmitigated, often gives rise to severe economic, social, and environmental risks: production systems are dismantled; people face impoverishment when their productive assets or income sources are lost; people are relocated to environments where their productive skills may be less applicable and the competition for resources greater; community institutions and social networks are weakened; kin groups are dispersed; and cultural identity, traditional authority, and the potential for mutual help are diminished or lost. This policy includes safeguards to address and mitigate these impoverishment risks

Depending on the location, scale and nature of the investments, especially under Component 2, the rehabilitation of existing structures or construction of new infrastructure, will require land acquisition. As a result, OP 4.12 on 'Involuntary Resettlement' has been triggered. However, since the precise nature of the sub-projects are unknown, this Environmental and Social Management Framework (ESMF) has been prepared alongside a separate Resettlement Policy Framework (RPF). Further, a Strategic Environmental and Social Assessment (SESA) will be prepared at the basin level to assess the potential social impacts and to integrate social consideration into the regulatory framework. All the safeguards instruments, will be publicly disclosed locally and via the Bank's external website.

2.4.7 Safety on Dams OP/BP 4.37

For the life of any dam, the owner is responsible for ensuring that appropriate measures are taken and sufficient resources provided for the safety of the dam, irrespective of its funding sources or construction status. Because there are serious consequences if a dam does not function properly or fails, the Bank is concerned about the safety of new dams it finances and existing dams on which a Bank-financed project is directly dependent.

OP/BP4.37 is triggered because of the proposed rehabilitation of dam headworks in selected sites (some of which are large dams), connectivity and dependence on water conveyance and control of the existing hydrological systems and water management infrastructure and the links of smaller tanks with the storage and operation of upstream medium/ large dams, which is typical for Sri Lanka's cascading tank and irrigation infrastructure. While the program will not finance physical interventions that involve the construction of new water bodies with embankments more than 15 meters high, the project will engage in the rehabilitation of such dams, hence the policy is triggered.

2.4.8. Consultations and Disclosure Requirements

For all Category A projects and as appropriate for Category B projects during the EA process, the project sponsor is required to consult project-affected groups and local nongovernmental organizations (NGOs) about the project's environmental aspects and take their views into account. The project sponsor should initiate such consultations as early as possible. For Category A projects, the project sponsor should consult these groups at least twice (a) shortly after environmental screening and before the terms of reference for the EA are finalized, and (b) once a draft EA report is prepared. In addition, the project sponsor should consult with such groups throughout project implementation, as necessary to address EA related issues that affect them.

Application to IWWMP: In order to comply with the safeguard policies triggered, the GOSL has prepared this Environmental and Social Management Framework (ESMF) and conducted consultation with stakeholders during the ESMF preparation. The implementing agency has publicly disclosed the ESMF for public information via the Ministry's website prior to project appraisal. Newspaper and other media outlet have been alerted to

the availability of the documentation for public review. The ESMF is also available through the Bank's external website.

2.5 Applicability of the World Bank Environmental and Social Framework to the IWWRMP

This Environmental and Social Framework (ESMF) sets out the World Bank's commitment to sustainable development through the Bank's safeguard policies that are designed to support Borrowers' projects, with the aim of ending extreme poverty and promoting shared prosperity. This Framework which specifically sets out the application of safeguard policies to the IWWRMP is further supported by an independent Resettlement Policy Framework (RPF) developed in parallel. This Framework comprises the following:

- A Vision for Sustainable Development, which sets out the Bank's aspirations regarding environmental and social sustainability in the proposed investment;
- The World Bank Environmental and Social Policy for Investment Project Financing, which sets out the mandatory requirements that apply to the proposed Bank financing; and

The RPF developed in parallel details the main social and livelihood impacts in addition to any possible displacement of people as a result of any of the interventions though the proposal does not identify any. It discusses the WB Policy on Involuntary Resettlement (OP 4.12).

2.6 World Bank Environment Health and Safety (EHS) Guidelines

The World Bank Groups Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry specific examples of Good International Industry Practice (GIIP). EHS Guidelines are applied as required by their respective policies and standards. These industry sector EHS guidelines are designed to be used together with the General EHS Guidelines document, which provides guidance to users on common EHS issues potentially applicable to all industry sectors.

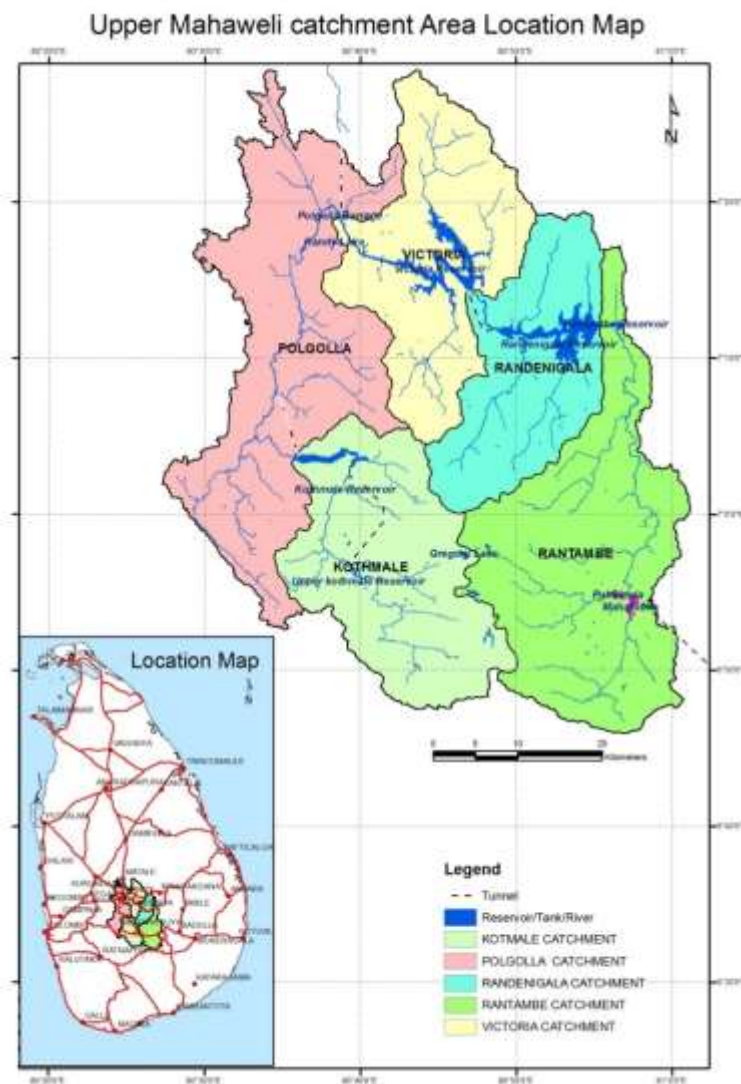
The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs. Application of the EHS Guidelines to existing facilities may involve the establishment of site-specific targets, with an appropriate timetable for achieving them. The applicability of the EHS Guidelines should be tailored to the hazards and risks established for each project on the basis of the results of an environmental assessment in which site-specific variables, such as host country context, assimilative capacity of the Defined as the exercise of professional skill, diligence, prudence and foresight that would be reasonably expected from skilled and experienced professionals engaged in the same type of undertaking under the same or similar circumstances globally. The circumstances that skilled and experienced professionals may find when evaluating the range of pollution prevention and control techniques available to a project may include, but are not limited to, varying levels of environmental degradation and environmental assimilative capacity as well as varying levels of financial and technical feasibility.

The applicability of specific technical recommendations should be based on the professional opinion of qualified and experienced persons. When host country regulations differ from the levels and measures presented in the EHS Guidelines, projects are expected to achieve whichever is more stringent. If less stringent levels or measures than those provided in these EHS Guidelines are appropriate, in view of specific project circumstances, a full and detailed justification for any proposed alternatives is needed as part of the site-specific environmental assessment. This justification should demonstrate that the choice for any alternate performance levels is protective of human health and the environment.

Chapter 3. Description of the Project Area

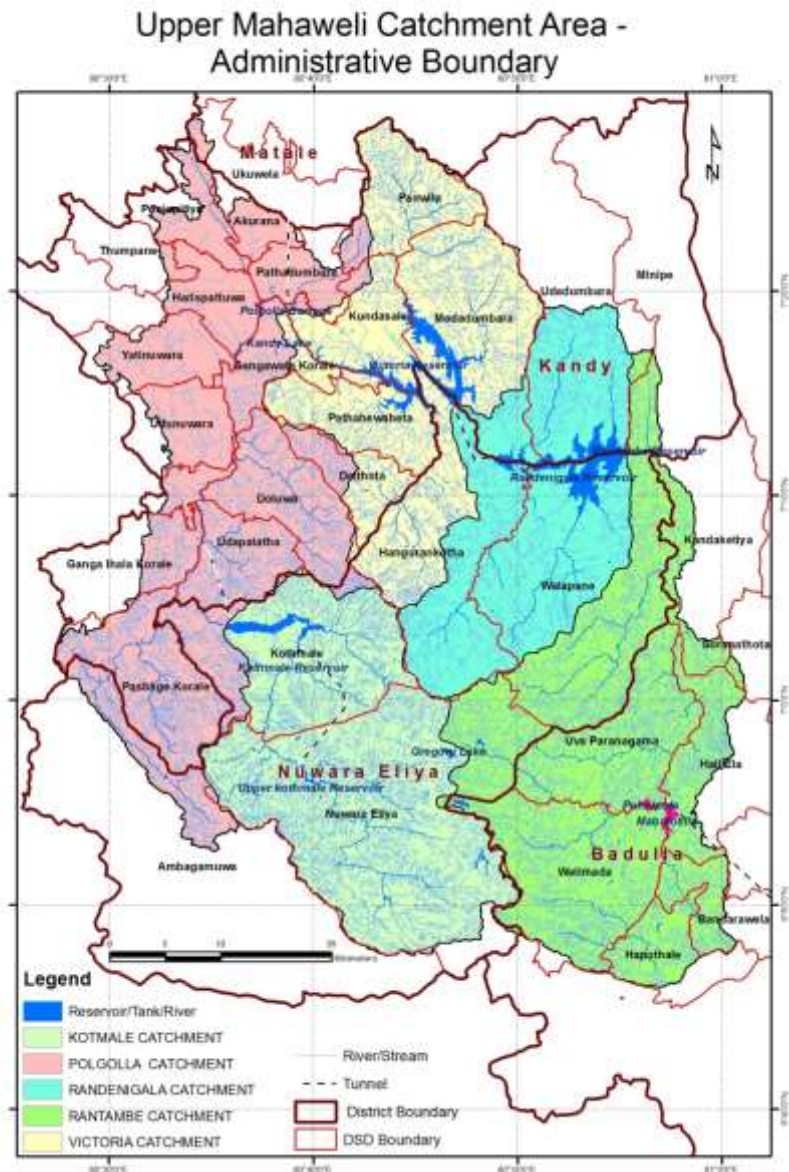
3.1 Component 1: Watershed and Water Resources Planning

Component 1 of IWWRRMP will focus on the Upper Mahaweli watershed consisting of 5 sub catchments - Victoria, Polgolla, Randenigala, Rantambe and Kothmale (see Figure 1). The Kothmale Victoria, Randenigala and Polgolla catments are limited to the Central Province (Kandy, Matale and Nuwara Eliya districts) whilst the Rantembe Catchment encompasses the Central Province and Badulla District of the Uva Province which covers 31 divisional secretariat divisions (refer Figure 2).



Source: MASL, 2019

Figure 1. Map showing the subcatchments within the project area



Source: MASL, 2019

Figure 2. Map showing the project area catchments and the administrative boundaries.

3.1.1 Physical environment and climate

The Victoria catchment extends over an area of 1,869 km². 722,000,000 m³, and has a gross storage capacity of 722,000,000 m³. Victoria Dam is an arch dam located 209 km upstream of the Mahaweli River's mouth and 6 km from Teldeniya. Its main purposes are irrigation and hydroelectric power production. It is the tallest dam in Sri Lanka, and is the largest hydroelectric power station in the country. Construction of the dam commenced in 1978, and was ceremonially completed in April 1985.²

The Kotmale sub catchment area is 561.00 Km² and the reservoir has a storage capacity of 174, 000,000 m³. The upstream of Mahaweli River (Kothmale Oya), was yoked to build Kotmale Reservoir, under the Accelerated

² [https://en.wikipedia.org/wiki/Victoria_Dam_\(Sri_Lanka\)](https://en.wikipedia.org/wiki/Victoria_Dam_(Sri_Lanka))

Mahaweli Development Program in 1980. It is the uppermost (highest in attitude) among Mahaweli Reservoirs. This is a multipurpose reservoir created for irrigation, drinking, and hydropower generation. The original storage volume has decreased due to the formation of sediments with an average annual loss of 0.23%^{3,4}. This has also lead to issues of eutrophication due to eroded soil nutrients from tea plantation in the catchment area.⁵

The Randenigala sub catchment is 2,330 km² and the reservoir has a total storage capacity of 861,000,000 m³. Randenigala is one of the largest reservoirs in the country being located in the Central Province. The Randenigala Dam is located 19 km downstream of the Victoria Dam, and 2.8 km upstream of the Rantembe Dam. The reservoir receives approximately 1,250–3,000 mm of rainfall annually and is further topped up with water from the Victoria Reservoir upstream, and the Mahaweli River.^{6,7}

Rantambe sub catchment area is 3,118 km² with the smallest reservoir capacity of 21,000,000 m³. The Rantembe Dam is located just 2.8 km downstream of the Randenigala Dam. It receives water from Randenigala and from Uma Oya. Rantambe catchment is spread over Kandy and Badulla districts.^{8,9}

Polgolla sub catchment covers an area of 738 km². Polgolla reservoir is a result of the Polgolla Barrage at Polgolla 6km from Kandy near Katugastota. It has a gross capacity of 4,100,000 m³. Polgolla Diversion is important as it was the initiative of Mahaweli Master Plan and the key point of diversion of Mahaweli River to Rajarata.

Since the project area falls within the administrative districts of Kandy, Matale, Nuwara Eliya and Badulla all parameters will be discussed for these areas based on available data.

The average annual temperature in Kandy is 24.5 °C with average precipitation of 2,083 mm. The average temperature for Matale district is 25.3 °C. The average annual rainfall is 1,860 mm. The average annual temperature for Nuwara Eliya district 16°C while the average temperature for Badulla district is 23.2 °C. The rainfall here averages 1,885 mm.

3.1.2 Topography and Geology

The Central Province and the Uva Province have the highest mountains in the country. The terrain is mostly mountainous, with deep valleys cutting into it. The two main mountain regions are the central massif and the Knuckles range to the east of Kandy. The elevation in the province ranges from 600 feet to over 6000 feet above sea level. The province is bordered on the north by the North-[Central Province](#), on the east by the

³ D. Johansson, "The Kotmale environment. A study of the environment impact of the Kotmale Hydropower project in Sri Lanka. SIDA evaluation report 1989/1, Infrastructure, Sri Lanka," in Proceedings of the Swedish International Development Authority, K. Goppers, Ed., Stockholm, Sweden, 1989.

⁴ R. L. Haturusinha and S. W. Ediriweera, "Maintenance and conservation of dams in Sri Lanka," in Proceedings of the Rehabilitation. Proceedings of the International Congress on Conservation and Rehabilitation of Dams, J. A. Llanos, J. Yague, F. Sanz de Ormijana, M. Cabrera, and J. S. Penas, Eds., pp. 11–13, Madrid, Spain, 2003.

⁵ [Chandrasekara,S., Venkatraman,P., and Hyun-Han,K. 2017.](#) Monitoring Water Resources over the Kotmale Reservoir in Sri Lanka Using ENSO Phases.**Advances in Meteorology**

⁶ https://en.wikipedia.org/wiki/Randenigala_Dam

⁷ Senadeera, W. 2014. Morphometric Analysis of Randenigala Reservoir Catchment using GIS. IJMS, vol1(2): 75-82..

⁸ https://en.wikipedia.org/wiki/Rantembe_Dam

⁹ <http://www.damsafety.lk/?p=dswrpp-works-phase-1&locale=en&id=45>

Mahaweli River, on the south by Uma Oya and the Peak Wilderness mountain range (Adam's Peak, Kirigalpotta and Thotapala) and on the west by the Dolosbage and Galagedera mountain ranges.

Based on major climatic zones of the country, Matale District fall in to upcountry - wet, mid country - intermediate and mid country - wet zones. Kandy District falls within up country - wet, mid country - wet, and mid country - intermediate zones. Nuwara Eliya District falls in to upcountry - wet, mid country - wet, mid country - intermediate and up country - dry zones.

Kandy District

Kandy district mainly consists of mountain ranges and valleys, spreading over a land extent of 190,630 ha. District boundaries are: Matale district from North; Nuwara Eliya and Badulla districts from East; and Kegalle and Kurunegala districts from West. The district is located at latitude 69.56 – 70.29 N and longitude 80.25 – 80.00 E. Major soil types found in the District are Red Yellow Podzolic (RYP), Immature Brown Loams (IBL) and Reddish Brown Latasolic (RBL) soils.

Matale District

The Matale administrative District which forms an integral part of the Central province, spreads over a land area of 1,236.8 km². Matale District areas its borders with Kandy, Kurunegala, Anuradhapura, Polonnaruwa and Ampara districts. It comprises rugged terrains with elevation ranging from 100 m to 1,905 m (only about 15% of the district lies above an elevation of 1000 m). The Knuckles range forms a distinct morphological region within the Central Highlands where its northern part comes within the Matale District; its southern flanks spread over to the Kandy District. Characterization of the environmental setting of the Matale District has to take into account its great physical diversity.

Nuwara Eliya District

Nuwara Eliya district is located in the hill country of Central Province. The terrain is generally mountainous, with deep valleys. Altitudes of the district vary from 300 to 2,000 m due to mountainous landscape. Out of the total lands, 78% is located on slopes more than 30% gradient and 15% of the lands on more than 60% slopes. Nuwara Eliya is situated in the middle of the country's highest Peneplain. The Southern border of this peneplain runs about 50 miles from Sri Pada or Adam's Peak (7,360 feet) which is on the Western side to Namunukula (6,360 feet) of the Eastern side. From the middle of this Southern border and running towards North is the High Plains that extends between Kirigalpotta (7,875 feet) and Pidurutalagala (8292 feet). Nuwara Eliya town (6128 feet) is situated near the Pidurutalagala mountain (the highest point in the country). The scenic grasslands of Horton Plains, Moon Plains, Kandepola-Sita Eliya Plains and Elk plains all are situated in this altitude range of 6000 to 7000 feet, few tens of kilometers away from Nuwara Eliya town. The main soil type found in the District is Red Yellow Podzolic (RYP).

Badulla District

The extent of Badulla District is 286,100 ha, of which only 3,400 ha are covered by inland water bodies. The province has a diverse landscape with high mountainous areas that originate some rivers that give rise to some of the most picturesque waterfalls in the country. It accommodates a reasonable portion of the central highlands that rapidly drops to the surrounding peneplain creating escarpments. The world's end drops from the Horton Plains, Diyaluma, Dunhida and Rawana falla are some of the best-known waterfalls in the island. The main soil types found in the northern part of the District are Reddish Brown earths, Low Humic Gley.

Immature Brown Loam soil is found in the middle part of the District. Southern upcountry area of the District is covered mostly by Red Yellow Podzolic soils.

3.1.3 Land Use

The overall land use in the project area under component one is shown in the map below. In the area the main land use types put together are tea including seedling tea, annual crops and forests and scrub.¹⁰ This is closely followed by home gardens that are intermittent with annual crops and paddy.

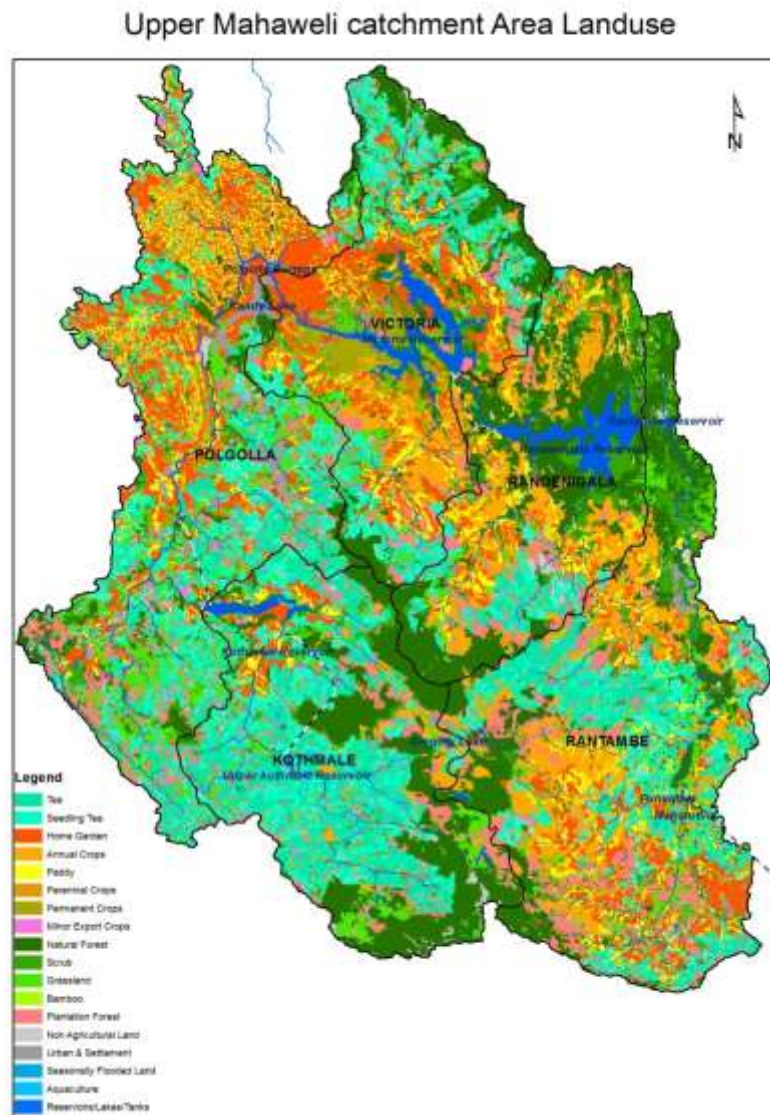
Kandy District

Kandy is located in the mountainous and thickly forested interior of the island. Of the total extent of land in the district, 43,060 ha or 22.6%, is used for tea plantation. The area used for paddy cultivation is about 10% and natural dense forest cover stands at about 13.6% which has decreased over time due to pressure on the use of land.

Matale District

The prominent land use type in Matale district is forest lands that 50% with approximately 30% being thick forest and 20% scrub. Home gardens rank second with 20%. Among the agricultural lands paddy is a key cultivation in the area (10%). Only 8% of the land is utilized equally for rubber and tea cultivation in the district. Small amount of chena cultivation is also prevalent in the district.

¹⁰ Statistics provided by MASL, 2019.



Source: MASL, 2019

Figure 3. Landuse map for the project area.

Nuwara Eliya District

Of the total extent of land in the district, 50,266 ha or 29%, is used for tea plantation. The area used for paddy cultivation is only about 4 %. Natural dense forest cover has decreased to 19 % due to pressure on the use of land. Nuwera Eliya district is also reputed for dairy cows and according to census and statistics, in 2010, there were 20,460 livestock farms in Nuwera Eliya district, consisting of 18,349 dairy cows' farms and 1,863 poultry farms.

Badulla District

The district of Badulla is predominantly characterized by plantation agriculture and rural economics, consequently increasing the number of low income people in the area. Of the total extent of land in the district, 34% is used for paddy, tea, rubber, coconut and other extra crop cultivation. Other plantation agriculture includes potato cultivation amongst other vegetable. Home gardens and chena cultivation is also

fairly abundant in the district. The natural forest cover has decreased to 16 % due to pressure on the use of land.

3.1.4 Main Water bodies and flow regimes within the project area

Mahaweli River is the main river in the Victoria Left Bank project area. It is nourished by several tributaries/rivers such as Hulu Ganga, Rathmal Oya, Ma Oya etc. The main reservoirs within the project includes Victoria and Randenigala, Rantambe, Kothmale and the Polgolla Barrage. The flow diagram given below depicts the flow regime within the watershed area identifying all the water tributaries.

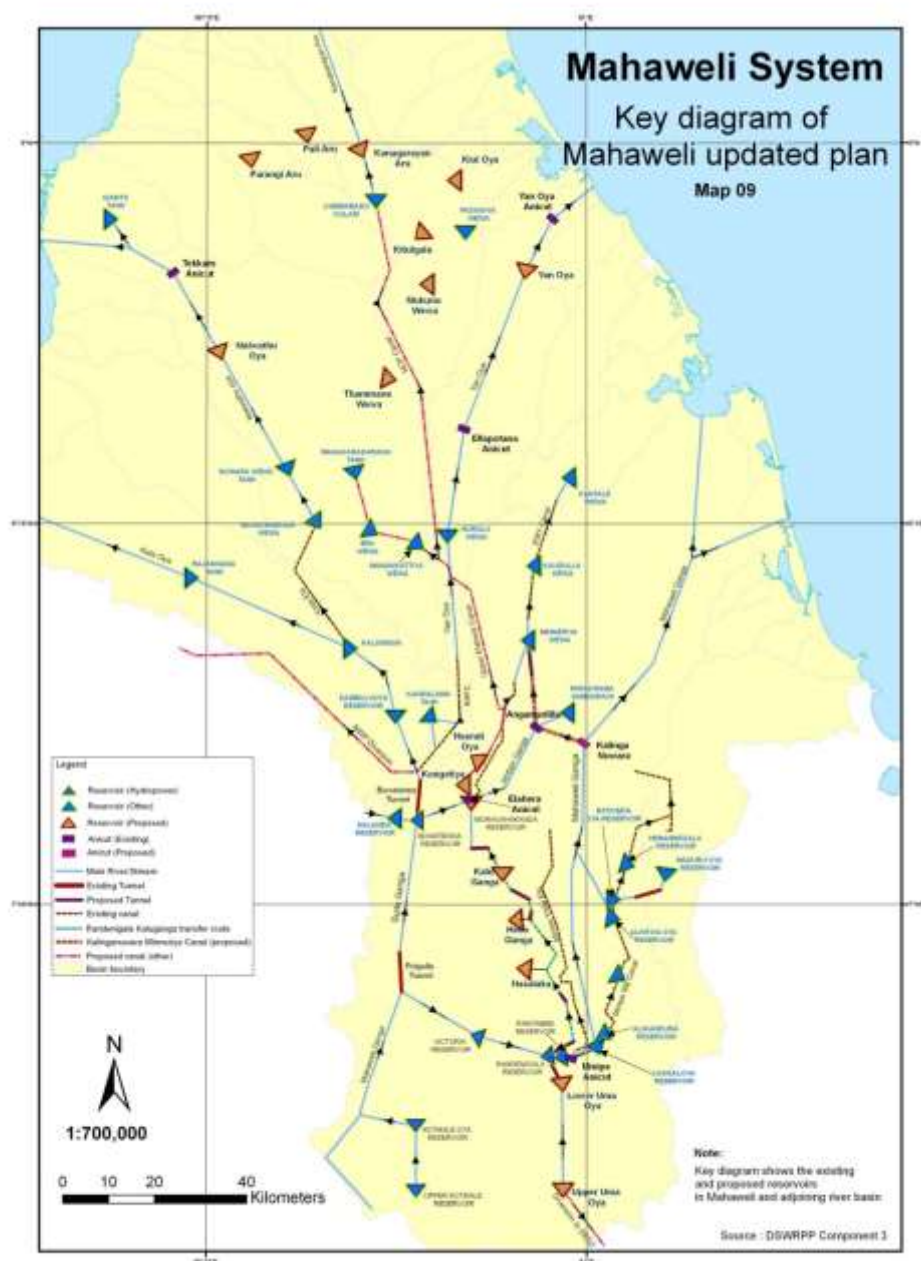


Figure 4. Flow Diagram of waterways in project area

3.1.5 Built Environment

Kandy, Matale and Nuwara Eliya districts

Estimated mid-year population of Kandy and Nuwara Eliya districts are 1,468,000 and 763,000 respectively. The estimated mid-year population of Matale District is 519,000 persons with a population density of 260 persons per km². Population density in Kandy is 756 and Nuwara Eliya is 438 persons per km². Majority of the population living in the three districts live in estates. From the three districts, Matale district has the highest proportion of urban population (14.1%) followed by Kandy district (12.1%) and Nuwara Eliya district (5.9%). Majority of population in Matale (80.7%) and Kandy (74.3%) districts are Sinhalese while in Nuwara Eliya district it is Indian Tamils (53.2%). Muslims are the second majority population in Matale and Kandy districts, while Singhalese are second in Nuwara Eliya district. In the Central province, 70.6% of the population is considered rural, 18.9% estate and 10.5% urban with urbanization being at 12.4% in Matale and Kandy. Nuwara Eliya district records a lower 5.6% urbanization. In this Province the female population is marginally higher than the male population (52% female and 48% male) ¹¹.

The Kandy city is situated in a valley bottom surrounded by green hill slopes and bounded by the Mahaweli River on the North East and West and South by the Hantane range¹². With the introduction of open economic policy into the country had created rapid constructions that have expanded the built up area city of Kandy and the suburbs changing the natural landscape.

Badulla District

The total population in Badulla District is approximately 886,000. Gender wise, 49.6 % of the is represented by males and the rest 50.4% by females. The population density of Badulla district is 288 persons per km². Of this population, only 414,786 are employed, whereas 24,299 of the labour force are unemployed. The total household units exceed 219,300. The distribution of the population indicates multi ethnicity including Sinhalese, Tamils, Muslims and other races in its structure. ¹³

3.1.6 Historically and Culturally Important Areas

Uva province is rich with religious, cultural and archeologically significant places. The ancient Mahiyanganaya Rajamaha Viharaya, Muthiyangana and Katharagama, Dowa Raja Maha Viharaya, Bogoda temple and Wooden Bridge of Bogoda, Bogoda Raja Maha Vihara Rock, Maligawila statue, Buduruwagala sculptures, Dematamal Viharaya are the important sites in the province.

Both the hill capital Kandy and the city of NuwaraEliya are located within the Central Province as well as Sri Pada. Central Province attracts many tourists, with hill station towns such as Kandy, Gampola, Hatton,

¹¹ Department of Census and Statistics, updated estimates for 2018.

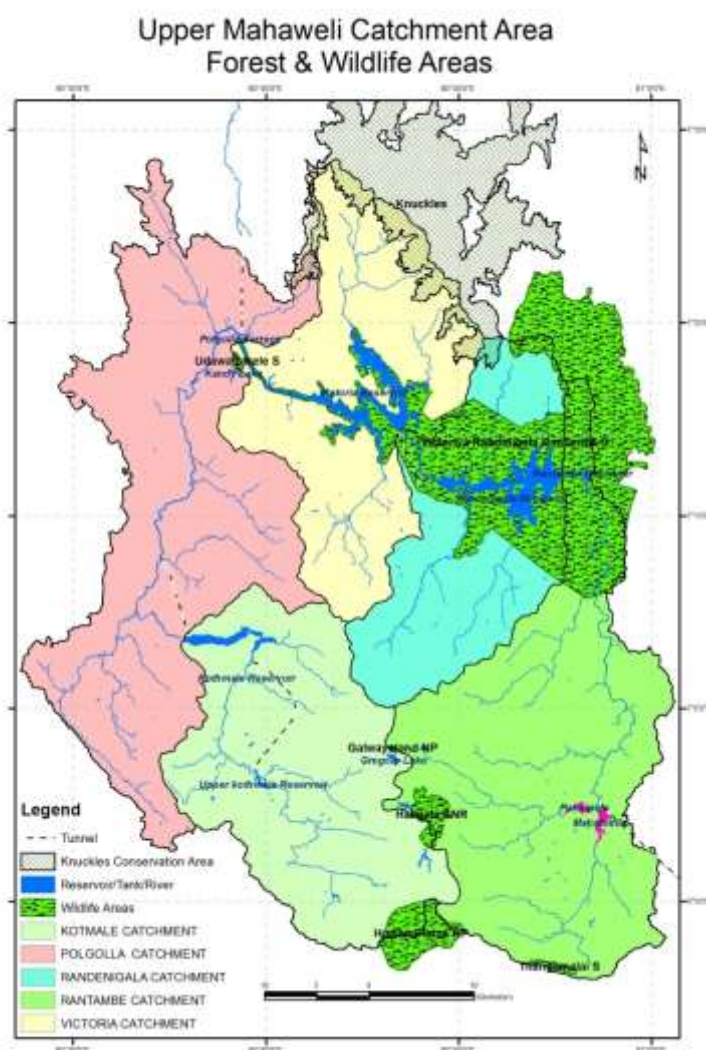
¹² R.J.M Uduporuwa and L. Manawadu.2017. Impact of Urban Growth on Vegetation Cover in World Heritage City of Kandy, Sri Lanka: An Assessment Using GIS and RS Techniques .Proceedings of 102nd The IIER International Conference, Singapore, 2nd -3rd May 2017, ISBN: 978-93-86291-88-2

¹³ Department of Census and Statistics, updated estimates for 2018.

Haputale, Bandarawela, Diyatalawa and Nuwara Eliya. Temple of the tooth or Dalada Maligawa at Kandy, Central province is the holiest temple of Buddhist world of Theravada.

3.1.7 Ecologically Important/Sensitive Habitats

In 2010 Horton Plains National Park (Nuwara Eliya district), the Knuckles Conservation Area (Matale district) was declared as a World Heritage site by UNESCO. The Knuckled mountain range is located in Matale district and is declared as conservation forest. The Knuckles mountain range is in the eastern part of the central highlands spreading over Matale and Kandy districts. A study undertaken by IUCN, Sri Lanka exhibits that the area contains 1,033 flowering plant species belonging to 141 families, out of which 160 species are endemic to Sri Lanka. In addition, out of 338 vertebrates species found, 99 are endemic and 28 are globally threatened species. The Knuckles range covers around 30% of the watershed of the Mahaweli River. The water supply of Victoria, Randenigala and Moragahakanda irrigation projects depend heavily on the Knuckles forest watershed area. Another important area is the Victoria, Randenigala and Rantambe Sanctuary in the valley of the Mahaweli River just outside of Kandy, This sanctuary safeguards the catchment basin of the three reservoirs it is named after. The area lies in the lee of the country's central mountain range and as a result features typical dry zone climate even though it geographically lies in the wet zone (see Figure 5 for locations).



Source:MASL, 2019

Figure 5. The main ecologically important areas within the project site

Ravana Ella Sanctuary, Badulu Oya river basin and Gallanda Oya, Hakgala Mipilimana Forest Reserve, Thangamale Sanctuary, Namunukula forest reserve and Haputale Forest Reserve are other important ecosystems found in the Badulla district. Part of the Maduruoya National Park also lies towards the Eastern border of district.

3.1.8 Other Areas of Environmental Concern

Land degradation

A recent study on soil erosion showed that Kandy (32%), Nuwara Eliya (40.7%), Badulla (36.5% high erosion hazard), and Matale (20.3%) were susceptible mainly due to the topography and the land changes observed in these districts¹⁴. According to district level maps of soil erosion hazard, Badulla, Kandy, Nuwara Eliya, Matale were identified as districts that are susceptible for severe erosion¹⁵. Major portion of land in the Upper Mahaweli catchment (UMC) is presently under tea cultivation which also contributes to severe soil erosion¹⁶.

Soil erosion in up-country has led to siltation of reservoirs. During 1952 to 1982, it was recorded that 15 million tons of silt has been transported from Upper Mahaweli through Peradeniya measuring centre¹⁷. Estimates of the rate of soil loss on hill slopes and sediment yields in the fluvial system of the (UMC) indicate that the human-mediated activities in the UMC have increased rates of ongoing erosion by > 100 times over the background rates of natural erosion¹⁸.

Deforestation and encroachment

The project area has experienced deforestation and Matale and Badulla areas have been identified as requiring forest restoration programs. In Kandy and Matale land is encroached for gem mining¹⁹ and cardamom cultivation. This is common in the Knuckles mountain range as the Forest Department issued 20-year leases to individuals to cultivate cardamom in the Knuckles forest range in 1976²⁰. With the increased demand placed for cardamom in the international market encroachment of forest for under planting has become a prevalent practice. This is an irreversible forest degradation practice that removes the undergrowth of forest fauna and flora, thus impacting the biodiversity. Cardamom cultivators have impacted the environment and forest biodiversity by following various agricultural practices such as annual clearing of under growth for land preparation; Removing some trees in the upper strata of the forests or cutting or lopping of branches of the trees in order to obtain required light regime to the crop; etc.

¹⁴ M.J.P.T.M. Jayasekara, H.K. Kadupitiya and U.W.A. Vitharana Mapping of Soil Erosion Hazard Zones of Sri Lanka. Tropical Agricultural Research Vol. 29 (2): 135 – 146 (2018)

¹⁵ ibid

¹⁶ Hewawasam, T. 2010. Effect of land use in the upper Mahaweli catchment area on erosion, landslides and siltation in hydropower reservoirs of Sri Lanka. J.Natn.Sci.Foundation Sri Lanka 2010 38 (1): 3-14

¹⁷ D.R.I.B., Werellagama, Jeyavijithan, V. Manatunga, J. and Nakayama, M. 2005. Lessons Learned from Communities Displaced by The Mahaweli Multipurpose Development Project Sri Lanka. global studies series of McGraw Hill Higher education. ISBN 0-07-319873, pp192-196.

¹⁸ Hewawasam, T. 2010. Effect of land use in the upper Mahaweli catchment area on erosion, landslides and siltation in hydropower reservoirs of Sri Lanka. J.Natn.Sci.Foundation Sri Lanka 2010 38 (1): 3-14

¹⁹ ibid

²⁰ ibid

These activities have changed the plant vegetation of the forest, reduced the fertility and water holding capacity of the soil thereby affecting the flow of water (due to low percolation and increased runoff) caused by reduction of vegetation cover and high soil erosion²¹.

Disaster risk and climate change

Based on the landslide hazardous zoning of the National Building Research Organization (NBRO), some of the areas in Matale, Kandy and Nuwara Eliya districts have been identified as landslide prone areas and declared as unsuitable for settlement or development activities. These districts experience high risk of earth slips and damage by high winds²². Hydroelectric reservoirs in the region are under great risk of sedimentation and the agricultural lands in the area have been losing their productivity at a rapid rate. Sedimentation in the drainage systems downstream increase the incidents of flash flooding in the lowland areas which is becoming a recurrent natural hazard during periods of high intensity rainfall being brought on by climate change. Regions with sharp gradients along the mountain massifs (Nuwara Eliya, Badulla and Matale) also show high risk of multiple natural disaster hazards²³ where human activities have been the predominant cause for landslides.

3.2 Component 2: Infrastructure improvement

3.2.1 Improvement to Dam and Major Water Asserts

Under this component activities will be undertaken as follows:

- Dam head works/canal rehabilitation activities – mostly in the dry zone and a few in Kandy and Matale
- Electro mechanical and limited civil works mostly in the large multipurpose reservoirs in the Mahaweli area and Uda Walawe reservoir and canal rehabilitation in the Walawe catchment
- Canal rehabilitation in a number of irrigation schemes in the Northern Province.

Hence the descriptions will be based on representative sample sites of Gal Oya Reservoir, Elehara Canal, Dewahuwa Irrigation System, Victoria reservoir (already discussed under component 1), Uda Walawe reservoir, Walawe cascade system and the Northern Province. Overall most of the interventions are planned for the Dry and intermediate zones of Sri Lanka.

This component would be supporting rehabilitation of numerous dam and canal sites across the country, details of which are being finalized, hence, for presenting a baseline environmental description of the typical environments has been done through a sample of representative sites including the Gal Oya Reservoir (*large multi-purpose scheme in the dry zone*), Yoda Ela irrigation canal (*ancient irrigation canal in the dry zone*), Uda Walawe reservoir (*medium scale irrigation reservoir in the dry zone*) and the ancient Dewahuwa Tank (*medium size irrigation reservoir in the wet to intermediate zone*)

Physical Environment

The Gal Oya Irrigation Project was the first multipurpose Scheme started in Sri Lanka. After nearly over 20 years, the project is in a rather poor condition. The original project served an area of 45,000 acres, however

²¹ ibid

²² UN-REDD programme. Drivers of Deforestation and Forest Degradation in Sri Lanka: Assessment of Key Policies and Measures. Science and Technology Cell Faculty of Science University of Colombo November, 2014

²³ L. Zubair, V. Ralapanawe, U. Tennakoon, Yahiya, Z. and R. Perera. Natural Disaster Risks in Sri Lanka: Mapping Hazards and Risk Hotspots. Natural disaster hotspot case study

after over 23 yrs, Irrigation facilities were available only for nearly 32,500 acres for Maha and 19,250 acres for Yala. The reservoir (*see image below*), also known as the Inginiyagala Reservoir, and more commonly as the Senanayake Samudraya, has a total storage of 950,000,000 m³ and a surface area of 91 km². The Gal Oya Reservoir is situated in the Badulla District of Uva Province and its water is used primarily for irrigation in the Uva and [Eastern](#) provinces, in addition to powering a small hydroelectric power station.



Elahera Minneriya Yoda Ela is a canal and is located in North Central Province. The estimate terrain elevation above sea level is 142 m. Yodha Ela (*see image below*) was constructed during the ancient times and is 87 km long^[2]. It is a trans-basin diversion canal transferring water from Kala Oya Basin to Malwathu Oya Basin. It functions as a moving reservoir because of its single banking aspect which is different from the present day irrigation canals that have double banks. It provides water to an area of 470 km² feeding 4,630 ha of paddy land and 120 small tanks on its way from Kala Wewa to Tissa Wewa.



Uda Walawe reservoir is located in the Sabaragamuwa Province, Sri Lanka and supports a multipurpose irrigation system. The estimate terrain elevation above sea level is 84 m. The total area under the reservoir at the full supply level is 3,413 ha. The gross water storage capacity of the reservoir is 268.7 Million m³. The Walawe scheme has a catchment area of 1,175 km².



The Dewahuwa Tank is an ancient tank that was once abandoned and decommissioned in 1950. It is located within the Matale district of Central Province and serves mainly as an irrigation tank overlooked by the Irrigation Department. The scheme comprises a large tank with a single main canal from which distributary channels take off on one side to serve the area. The settling is rural with farmer communities and one fishing community in the upstream area. The Dewahuwa irrigation system supports paddy cultivation as well as vegetable cultivation.



The topography of the Northern Province is slightly undulating with elevations ranging from 0 - 150 m and sometimes nearly 2000 m at the highest parts. The Northern Province embraces five districts namely, Jaffna, Killinochi, Mullaitivu, Mannar, and Vavuniya, 33 Divisional Secretary's Divisions (DS Divisions) and 912 Grama Niladhari Divisions (GN Divisions). The Province covers an area of 8,846.83 km² accounting for approximately 13% of the total land area of the island. This region has a forest cover of 1,981.30. km². Inland water bodies covers 197 km². Agro climatically the area falls into Dry Zone of Sri Lanka and the climate is characterized by high temperature and low rainfall. Mean annual rain fall is below 1500 mm. Majority of rainfall occurs during the North East monsoon (December-February), and rest is experienced during the Second Inter Monsoon (October to November). A small amount of rain is received during South West monsoon (May to September). This area receives sufficient rainfall by cyclones and depressions in some years. Annual average temperature of the area ranges from 24 - 33°C. Temperature is warm throughout the year and records highest from May to August. Relative humidity varies between 70 - 82% within the year.

Quaternary and Miocene limestone are predominant in the Jaffna peninsula and are of Phanerozoic era. Highly Karstic and permeable Miocene limestone aquifers are present along the coastal belt of Mannar district.

Reddish Brown Earth, Low Humic Gley, Red Yellow Latosol & Regosol soils, Solodized- Solonetz, Solonchaks & Grumusol soils are the common soil types in the area.

Land Use

Land uses in the Dry Zone consist of inland water bodies, scrub jungle areas and predominantly irrigated agricultural areas. The Dry Zone comprises three fourths of the country. The Dry Zone Plains are undulating with solitary hills. This area has a few large rivers and many seasonal streams associated with the rainy seasons. Agriculture is dependent on water storage in tanks and systems of irrigation canals that were developed from the first millennium BC to the 13th century. Decline and abandonment of these lands and depopulation lead to regrowth of monsoon and thorn forest over much of the Dry Zone until reclamation by new irrigation schemes. Currently, approximately 80% of the cultivations lands are in the Dry Zone with paddy being a main component²⁴.

Main Water bodies and flow regimes within the project area

Most of the rivers that originate in the wet zone or the central highlands flow down to the dry zone except for rivers like Kalu and Kelani. The Northern Province does not have a single perennial river, and very limited seasonal streams and rivers. Traditional water storage was through built irrigation tanks. The area belongs to the Dry Zone of Sri Lanka with low annual rainfall. The ground water surveys done prior to the conflict indicate that intensive agriculture, especially paddy, cannot be supported without adequate replenishment of surface water storage²⁵.

Ecologically Important/Sensitive Habitats

Dry zone habitats and forest areas are larger and level of biodiversity and endemism substantially lower than in the wet zone. The adverse impacts of forest loss on biodiversity are severe for the large mammals like the leopard, elephant and primate species. For these species the loss of forests due to expansion of settlements, irrigated agriculture and chena have caused a reduction of contiguous geographic ranges.²⁶ Protected Areas located in the Northern Province are Chundikulam (11,150ha), Kokilai (1,995ha), Gaint Tank (4,330 ha), Vavunikulam (4,856ha), Paritivu (97.1ha) and Vankalai (4,839ha). Under the Northern province SEA sensitive habitats such as the corridor between Wilpattu national park Madhu road sanctuary, corridor between the giant tank sanctuaries in Neenthavil forest reserve, Thodaveli A Veditallativu sanctuary, Delft National Park, Nagapaduwan, Neenthavil and Akkiiriyan Forest reserves, Nanthi kadal sanctuary, Corridor between Nainamadu, Chamalankulum forest reserves, Andankulum and Nainamadu forest reserves with the Padaviya tank sanctuary and Vaunikulum sanctuary have been identified. The sanctuaries, corridors and forest reserves are important in terms of elephant migration, biodiversity and wetland conservation.

²⁴ Dent, D.L. and Goonewardene, L.K.P.A. 1993. RESOURCE ASSESSMENT AND LAND USE PLANNING IN SRI LANKA: A CASE STUDY.

²⁵ Dharmaratne. T.A.. 2014. An Overall Assessment of the Agricultural Marketing Systems in Northern Province of Sri Lanka. Hector Kobbekaduwa Agrarian Research and Training Institute, Sri Lanka.

²⁶ [Overview of biodiversity status, trends and threats](#), Fourth Country Report from Sri Lanka to the United Nations Convention on Biological Diversity.

Significant and sensitive habitats found in other parts of the Dry Zone are numerous including National Strict Nature Reserves of Wilpattu, Wosgamuwa, Minneriya-Giritale, Somawathiya, Maruoya. Forest reserves in the area are also many including Hurulu, Kahalla, Minneriya, Yodha Ela Wedha Kanda etc.²⁷,

Built Environment

The built environment around irrigation landscapes in the Dry Zone are typically rural. The ethnic composition is varied with a mix of predominantly Sinhalese, Tamil, and Islamic populations.

Historically and Culturally Important Areas

The Dry zone has many physically and culturally significant areas especially in North Central Province with all the ancient irrigation schemes and kingdoms of which some are declared World Heritage Sites under UNESCO. Other areas in the country also have significant monuments and places. A detailed assessment based on the area of influence will have to be carried out for each of the subproject locations.

Other Areas of Environmental Concern

Deforestation and encroachment

Deforestation caused by shifting cultivation, timber exploitation, fuel wood collection, encroachment of agriculture on forested areas. Forest cover change between 1992 and 2010 shows that deforestation has slowed down in the country. Deforestation appears to be more scattered and widespread all over the country instead of being concentrated largely into few selected areas, and takes place at a higher rate in the dry zone compared to the wet zone. The colonization schemes supported by large-scale irrigation development projects opened a second wave of deforestation that lasted for about 50 years from the early to final decades of the twentieth century especially in the Dry Zone areas. Secondly, there are land problems of second and subsequent generations of settled agricultural communities that give rise to encroachments of local forests.²⁸

Disaster risk and climate change

The higher food insecurity in the Northern Province is due to dry climatic conditions punctuated by cyclones and heavy rainfall experienced. Anuradhapura District is one of the high drought disaster risk areas²⁹. In 2017, 7660 people in the North Central Province were affected by water shortage due to the drought³⁰. Paddy fields are in high concentration in the hazard-prone region. The storm surge common during these cyclonic events, result in an intense gust of wind can be destructive. Intense rainfall comes along with cyclones giving rise to floods and flash floods.

²⁷ Biodiversity Secretariat Ministry of Environment & Natural Resources, 2008. NORTH-CENTRALPROVINCE BIODIVERSITY PROFILE AND CONSERVATION ACTION PLAN.

²⁸ Sri Lanka UN-REDD Programme. 2015. Report on Drivers of Deforestation and Forest Degradation in Sri Lanka: Assessment of Key Policies and Measures.

²⁹L. Zubair, V. Ralapanawe, U. Tennakoon, Yahiya, Z. and R. Perera. Natural Disaster Risks in Sri Lanka: Mapping Hazards and Risk Hotspots. Natural disaster hotspot case study

³⁰ <http://www.desinventar.lk/>

Chapter 4 – Assessment of Environmental and Social Impacts and Impact Management Framework

4.1 Preliminary assessment of environmental and social impacts of IWWRMP

4.1.1 Overview

The project is undoubtedly expected to bring about significant environmental and social benefits to the country via improved and scientifically informed use and management of water resources on par with international best practice. The project will have significant benefits particularly with regards to improvement of food security, health and wellbeing, especially in terms of providing water for agriculture, improving soil fertility and reducing potential outbreaks of epidemic infectious diseases and strengthened livelihoods. The project will contribute to poverty reduction as well as to the improvement of socio-economic and health indicators of the project host areas. Construction works (e.g. excavation for pipelines) will present employment opportunities to local people (including women) and generate direct income benefits to local households. The Project is supporting the GoSL's effort to introduce a new paradigm of catchment planning that improves participatory water resource and watershed management at all levels to better reflect the needs of local communities. This will be pilot tested in one of Sri Lanka's most critical upper watersheds of the Mahaweli River.

While the overall program is environmentally and socially beneficial, the construction of new infrastructure and upgrading of existing infrastructure are likely to result in certain adverse environmental and social impacts that will need to be identified and mitigated across the design and implementation phases of the investments. These environmental and social impacts will depend on the environmental and social sensitivities associated with the location, scale of the type of subproject. It is deemed that proposed IWWRMP subprojects activities will not result in significant long term adverse environmental or social impacts under components 1 and 2 and if identified at the inception of the sub projects, adequate mitigation measures can be adopted to minimize or negate these impacts. The overall objective being to improve water resources management and development in the country, the overall positive environment and social outcomes of the project will outweigh the negative impacts.

The project has been categorized as **safeguards category B** given that the anticipated social and environmental impacts are fairly predictable, localized and mitigatable with known technology. This project is very similar in scope to the Dam Safety and Water Resources Planning Project which has been successfully completed in 2016. As such, much experience and knowledge on the kind of impacts and practical mitigation options are known to the implementation agencies.

In terms of cultural heritage and indigenous people the risks in the project are minimal as there are no interventions that are identified to impact negatively on them. Indigenous community in Sri Lanka is very small and isolated to small areas and is unlikely to be affected by project activities. Though there are several ethnic groups, it is unlikely that there will be any negative impacts as a result of the project interventions. There may be positive impacts with livelihood improvements especially in the tea plantation areas where the Tamil plantations labor force is.

This ESMF has been designed to achieve sound environmental practice within the purview of IWWRMP. The ESMF provides a mechanism to assist program implementation by screening out or enhancing acceptability of sub-projects based on environmental and social criteria. By a simple process of elimination, the first step in

the screening process is to identify subproject activities not suitable for funding. All processes described in the ESMF can be adjusted based on implementation experience. Hence, the ESMF will be a living document and will be reviewed and updated periodically as needed.

It is recommended that the following types of subprojects are not financed and therefore should be considered as a "Negative List":

Environment:

- Sub-projects that involve the significant conversion or degradation of critical natural habitats such as protected areas and other sensitive ecosystems known to harbor critical species populations.
- Activities that could lead to invasion or spread of weeds and feral animals or the use of toxic chemicals, intensive use of pesticides and activities that generate large quantities of pollutants.
- Activities that could dangerously lead to the exposure of sensitive/critical/vulnerable habitats
- The reclamation of wetlands.
- Construction of new large infrastructure within or directly adjacent (in buffer zones) to the following
 - Designated Protected Areas including marine protected areas.
 - Designated Sites of Cultural heritage- Sacred Cities/ UNESCO World Heritage Sites
 - Known Elephant Corridors
- Illegal Activities as defined specifically under the Forest Ordinance and Fauna and Flora Protection Ordinance, as outlined in Chapter 3.

Social:

- Activities that require relocation, and/or structural demolition of any homes or business due to project interventions.
- Activities that require land acquisition and involuntary resettlement that affects more than 20 families (as outlined in the NEA as well as the NIRP described in the RPF).
- Activities likely to create adverse impacts on ethnic groups within the village and/or in neighboring villages.
- Activities that lead to loss or damage to cultural property, including sites having archeological (prehistoric), paleontological, historical, religious, cultural and unique natural values.

4.1.2 Overall project impacts

The general positive and negative impacts that are very likely to arise from the sub-projects under components 1, 2, and 3 are provided below.

Positive impacts of project

Environment:

- Reduced land degradation and landslide stabilization.
- Reduced water wastage and improved water resources monitoring systems
- Increased awareness and capacity in coping with disasters
- Improved water quality through management of run off and waste discharge
- Improved safety of water infrastructure
- Improved ground water management
- Increased technical capacity in water resource management and monitoring among the stakeholders

Social:

- Improved livelihood opportunities for the project influence populations by animal husbandry, agroforestry, ecotourism, etc
- Improved water and sanitation
- Project area influence infrastructure development
- Improved water resources monitoring systems
- Increased accessibility of water in water scarce areas

Negative impacts of project***Environment:***

- Impacts on water quality due to canal bank protection and desilting
- Impacts on air quality from use of machinery and construction activities
- Emissions of particulate matter by earthworks and removal of vegetation cover
- Impacts of noise from construction activity
- Impacts of vibration on structural safety of buildings adjacent to construction sites
- Impacts (off-site) of material extraction (earth, rocks, turf)
- Impacts on forest ecosystems and bio-diversity due to temporary changes in river flow regimes associated with dewatering.
- Generation of other solid waste during construction and operation of the planned facilities
- Dredge material disposal that can cause environmental pollution and public health issues
- Increased soil erosion and siltation
- Increased risk of landslides when working on slopes
- Possible impacts on surface and/or ground water due to leakages from and intrusion of storm water
- Some of the investments will involve acquisition of electronic equipment that will emit greenhouse gasses or ozone depleting coolants in their operations
- Possible impacts on surface and/or ground water due to leakages from and intrusion of storm water
- Some of the investments will involve acquisition of electronic equipment that will emit greenhouse gasses or ozone depleting coolants in their operations

Social:

- Occupational hazards and impacts to public safety
- Temporary impacts on livelihoods
- Increased incidents of communicable diseases
- Potential conflicts over water availability

Cumulative impacts of the project

The next section will discuss briefly potential impacts against the potential intervention and activities that have been identified under each component, understanding that a detailed analysis will be carried out once interventions have been confirmed through the environmental assessment framework suggested. Overall cumulative impacts from the project would be positive and will include the following:

- Watershed management activities will help in checking erosion on hilly areas and this will lead to improved soil fertility and productivity in the areas; Investments in river banks stabilization will protect the rivers from siltation and sedimentation run-off;
- Watershed management programs will have multiple social, economic and environmental benefits in terms of contributing to carbon sequestration, improved livelihood opportunities. It will implement measures for the protection of biodiversity and will contribute to combating

desertification; enhancing reforestation, soil restoration and the implementation of national conservation activities.

- The watershed management will result in socio-economic benefits of the communities whilst at the same time establishing sound management practices to conserve soil and water in the project area of influence.
- Ground water management and establishment of ground water management systems will ensure long-term sustainability of the resource. Additionally, these measures add value to the target populations asset base (livestock and agriculture) and essentially improve their quality of life.
- All components will increase country's resilience to climate change risks by ensuring strengthened decision-making for water resources management in multiple ways.

4.1.3 General interventions/construction/ land preparation related impacts

Component 1- Watershed and Water Resources Planning

PROPOSED INTERVENTION	POTENTIAL IMPACTS	POTENTIAL MITIGATION
Subcomponent 1.1: Watershed management planning		
(a) This sub-component will provide immediate guidance on investment options while also developing the methodology, tools and systems needed for the government to develop and execute long-term plans and restore and manage its watersheds. It will also provide support for strengthening the national institutional and policy framework for watershed management planning. It will include the following activities.		
(i) Assessments: The subcomponent will help develop a WSM plan for the upper Mahaweli watershed through a consultative approach, with activities to be implemented at mini-watershed levels (Divisional Secretariat level watersheds). The plan will be based on an evidence-based diagnostic assessments of land use focusing on forests, active erosion, sediment generation, and agricultural practices.	This sub-component will primarily consist of technical studies/mapping to identify areas and causes of watershed degradation and planning to address degradation, hence there will be no physical activities such as civil works resulting in negative environmental impacts. On the whole, establishment of evidence based participatory watershed management systems and related capacity building will have many positive environmental	None
(i) Development of Watershed Plans: Based on the above assessments, a watershed management plan (including sub-watershed and micro-watershed plans) will be developed and discussed at the national, provincial, district, divisional and village levels.	impacts with regard to conserving important natural resources such as soil and water and set forth decision making in a direction that is responsive to scientific evidence and needs of the communities. Planning will focus heavily on watershed stakeholder participation from	Bring in existing expertise inputs from the various players/sectors within the study area at intermittent stages during the development of the plans.

Component 2- Infrastructure Improvement

PROPOSED INTERVENTION	POTENTIAL IMPACTS	REMARKS
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<p>(ii) Stakeholder consultations: Stakeholder participatory approaches will be developed and operationalized and anchored in the village-level watershed management committees that are facilitated and supported by government divisional and village-level officials. The village-level WSM activities will be informed by the evidence-based assessments.</p>	<p>the field to regional levels which will provide much valuable feedback to the process.</p> <p>Forest boundary demarcation will serve much in terms of protecting existing forest land from further loss and degradation due to activities such as encroachment. This may lead to loss of livelihood and conflict among illegal user groups.</p> <p>Unless incentives are given out systematically it may not end up with the most deserving persons.</p>	<p>Identification of stakeholder composition should be determined carefully to make sure it is inclusive of all players within the identified areas. Mechanisms should be identified to ensure active participation by atleast the main stakeholders.</p>
<p>(iii) Land demarcation: Support will be provided to the Forest Department to demarcate boundaries of forest land in the watershed.</p>		<p>Identify any illegal user groups and divert them to alternative livelihood avenues identified under this component.</p>
<p>Subcomponent 1.2: Watershed restoration</p> <p>The subcomponent will finance the works, goods, and services required to implement prioritized on- and off-farm WSM activities in the WSM plans to restore the hydrological and ecological functioning of watersheds and enhance the sustainability of existing land uses. This subcomponent will be confined to the Upper Mahaweli Watershed with the intention of demonstrating a scaled approach for future replication in adjacent watersheds.</p> <p><u>The investments on watersheds are likely to involve the following type of typical on- and off-farm soil and water conservation activities. The final activities will be identified only when the</u> Divisional Secretariat level watersheds <u>watershed plans are prepared, and the nature of the problem is diagnosed.</u></p>		
<p>Livelihood incentives and other soil conservation measures.</p>		

<p>Establishment of Fruit Orchards (fruits with export markets and super foods)</p>	<p>Positive impacts:</p> <ul style="list-style-type: none"> • Implementation will assist the JEDB, SLSPC estates to generate income to unemployed youth in the estate sector. • Livelihood improvement <p>Negative impact:</p> <p>Land transformation may lead to conflicting user issues</p>	
<p>Animal Husbandry and Fodder and Pasture Development</p> <p>Promotion of dairy cattle management, goat keeping, and poultry; distribution of improved breeds of animals, provision of financial support to establish improved animal husbandry.</p>	<p>Positive impacts:</p> <ul style="list-style-type: none"> • Livelihood improvement • Carbon assimilation crops will be grown and improved soil fertility <p>Negative impact:</p> <ul style="list-style-type: none"> • Pollution of the environment as a result of animal husbandry • Negative carbon foot print as result of increased emission of methane. 	<p>Adequate measures should be identified and recommended to manage the carbon foot print.</p>
<p>Introduction of inland aquaculture ornamental fish breeding along with other edible fish species; provision of support for tank and mud-pond culture.</p>	<p>Positive impacts:</p> <ul style="list-style-type: none"> • Reduced exploitation of endemic and indigenous fresh water fish species. • Livelihood improvement <p>Negative impact:</p> <ul style="list-style-type: none"> • Release of exotic ornamental fish species in to water bodies may lead to invasive spices issues. 	<p>Inland aquaculture ornamental fish breeding programs will have to be structured carefully so that no environmental outfalls occur with introduction of invasive species.</p>
<p>Vegetable cultivation on permanent terraces/ SALT; provision of financial support to construct permanent rock terraces/ SALT and other associated drain networks to control direct surface erosion</p>	<p>Positive impacts:</p> <ul style="list-style-type: none"> • Reduced surface erosion and loss of top soil from productive lands <p>Negative impact:</p> <ul style="list-style-type: none"> • Temporary disturbance of landscape during preparation. 	<p>Training locals to adopt proper soil management methods when terracing and creating drain networks.</p>
<p>The component will undertake irrigation canal rehabilitation and safety remedial works for dam headworks which could not be funded by the previous DSWRPP project. Altogether 55 sub-projects have been proposed for rehabilitation. To prioritize the investments, the risk level for each of the proposed schemes have been screened</p>		

Introduction of Floriculture for supply to local as well as overseas markets.	Positive impacts: <ul style="list-style-type: none"> • Livelihood improvement especially of women and youth. Negative impact: <ul style="list-style-type: none"> • Possible pollution of water bodies due to the release of leachates from the green houses. 	Subproject ESMPs should identify sources of pollution and suggest appropriate mitigation measures.
Beekeeping Improving crop production and livelihoods through Bee keeping.	Positive impacts: <ul style="list-style-type: none"> • Expected to increase the yields of the crops • Livelihood improvement especially targeting youth • Reduced exploitation of natural bee hives in the forested area Negative impact: <ul style="list-style-type: none"> • Safety issues during bee keeping 	Ensure safety training and awareness amongst those undertaking beekeeping activities.
Alternative livelihoods Provision of support to people to engaged in self – employment and to become stewards of conservation in producing various types of handicrafts	Positive impacts: <ul style="list-style-type: none"> • Livelihood improvement especially targeting women Negative impact: <ul style="list-style-type: none"> • Over exploitation of native forest resources. 	Ensuring resource availability in the local area based on a proper resource assessment for each industry. Alternative raw materials would need to be identified in certain instances.
Development of nurseries to supply the required planting materials for forestry and agricultural plants (collaborate with Departments of Agriculture and Forest Department) nurseries Develop nursery by SPC, JEED	Positive impacts: <ul style="list-style-type: none"> • Livelihood improvement especially targeting youth and women • Enrichment of habitats and watersheds and home gardens. 	Adopting proper drainage and control of mosquito breeding.
Agro product development through Introduction of Post-harvest Technology Support	Positive impacts: <ul style="list-style-type: none"> • Livelihood improvement • Minimize food waste during excess production of vegetables, fruits and other food products. • Value addition and improved marketability, 	Impacts will depend on type of agro food industry. For certain industries an EPL will have to be obtained providing recommendations for the location and nature of the activity.

<p>Introduction of water conservation technologies in agriculture Appropriate irrigation and protected Agriculture methodologies and production systems will be introduced to utilize the water in optimum manner.</p>	<p>Positive impacts:</p> <ul style="list-style-type: none"> • Improved water productivity • Unless properly maintained the precision irrigation systems will not provide the desired benefits. 	<p>Adequate financial mechanism and technical capacity should be in place long term sustainability.</p>
<p>Expansion of cultivation of export agriculture crops) Selected export agricultural products will be introduced with a view to increasing the tree cover and to increase the family income of the community in the area. This will be done with the assistance of Department of Export Agriculture.</p>	<p>Positive impacts:</p> <ul style="list-style-type: none"> • Livelihood improvement • Improved Kandyan home garden system • Watershed productivity improved. <p>Negative impact:</p> <ul style="list-style-type: none"> • Potential encroachment into forested areas leading to degradation of habitats. 	<p>Comprehensive buffer zone analysis will have to be done during sub project environmental assessment.</p>
<p>Support to Community Water Supply Schemes: Support will be given to the people who do not have access to water for drinking and domestic purposes. Micro structure to collect the running water and to distribute at household level.</p>	<p>Positive impacts:</p> <ul style="list-style-type: none"> • Improved accessibility to water and sanitation and human wellbeing <p>Negative impact:</p> <ul style="list-style-type: none"> • Potential issues of user conflict due to over exploitation. • Ecological impacts to aquatic fauna from the type of intake. 	<p>Inclusive surveys on availability of water need to be carried out identifying the scarcity areas. All water users need to be identified and estimates of water requirements for the different uses established. Environmental flows to be calculated Intake to be designed in a way that aquatic organism movement is not totally blocked.</p>
<p>Build and Restore Waterholes, Ponds and Tanks in suitable places to be used in small scale agricultural farms.</p>	<p>Positive impacts:</p> <ul style="list-style-type: none"> • Improve their food and water security and reduce impact during drought periods. • Improve the Climate Change resilience of the area and the Community. <p>Negative impact:</p> <ul style="list-style-type: none"> • Many attract wild animals in search of water and food leading to conflicting situations. 	<p>Carry out assessment on sensitive fauna and associated risks i.e Leopards, fishing cat Identify critically important biodiversity hotspots in the area and avoid such areas. Identify sites to collect and dispose of silt if excavation is involved.</p>

<p>Provide basic infrastructural facilities for the socio-economic improvement of the people.</p> <p>This additional support will help to enhance the living standards of the community including access road, School improvement activities etc.</p>	<p>Positive impacts:</p> <ul style="list-style-type: none"> Improved accessibility and connectivity and human wellbeing <p>Negative impact:</p> <ul style="list-style-type: none"> Temporary construction activities such as noise vibration, dust and temporary loss of access, exploitation of natural resource etc. 	<p>Feasibility reports should be carried out depending on location and sensitive nature of the ecosystems that will be impacted upon.</p>
<p>Recording and measurement of watershed data</p>	<p>Positive impacts:</p> <ul style="list-style-type: none"> Ensure the sustainability of the watershed and the project Better accessibility for information and to make informed decisions in river basin management. 	
<p>Fire Prevention in the watershed area.</p> <p>Forest fire has been contributing for watershed degradation. Assistance is given for awareness improvement and to prevent and extinguish the forest fire.</p>	<p>Positive impacts:</p> <ul style="list-style-type: none"> A comprehensive program in place to minimize the impacts of forest fires. <p>Negative impact:</p> <ul style="list-style-type: none"> Safety concerns using untrained personnel during fire management 	<p>Ensure that the proper linkages are established with fire regulation bodies and the DMC.</p>
<p>Eco-tourism promotion and Home-stay development</p>	<p>Positive impacts:</p> <ul style="list-style-type: none"> Livelihood improvement <p>Negative impact:</p> <ul style="list-style-type: none"> Potential social and cultural issue generated as result of usage of narcotics and sexual behavior. Special concern should be given for women and children. 	<p>Social assessment should be considered on the feasibility with emphasis on women and children.</p>
<p>Awareness, Education, Training and Capacity Building</p>	<p>Positive impacts:</p> <ul style="list-style-type: none"> Improved integrated watershed management. 	
<p>Media Visibility and distribution of information and knowledge material</p>	<p>Positive impacts:</p> <ul style="list-style-type: none"> Increased awareness on project and interest in adoption in other areas. Obtaining further constructive criticism to improve the project. 	

Water pollution control and mitigation measures	Positive impacts <ul style="list-style-type: none"> Watershed protection and pollution control. 	Build awareness and support in minimizing pollution and obtain EPLs where industries are setup. All infrastructure activities have to be compliant with the world bank health and safety and national guidelines.
Subcomponent 1.3: Multi-sector water resources planning		
This component will support soft interventions to strengthen capacity for water resources management in the country. As such, the impacts of this component will have long-term positive benefits to the country.		
This sub-component will specifically support the continuation of the program started under the Bank funded DSWRPP for establishment of long term and sustainable arrangements for safety of major dams. The envisaged outcomes include institutional arrangements, policies, and procedures for monitoring; risk assessment; identification of corrective actions to mitigate risks; regular operation and maintenance; dam operation during extreme climate events; and budgetary allocations for dam safety.	There will be no physical environmental and social impacts from this component, however, establishing permanent institutional arrangements for dam safety will minimize risks of dam failure and facilitate repair and rehabilitation of dams and dam components as risk all of which will yield numerous social and environmental benefits.	The Government has initiated action towards these outcomes. The Ministry of Mahaweli, Agriculture, Irrigation and Rural Development (MMAIRD) has sought approval of the Cabinet of Ministers to establish a National Dam Safety Center and funding arrangements. The Ministry of Irrigation has in parallel taken the first step to review the current dam safety practices; identify weaknesses in present dam safety practices; and study the current trends in regulation of dam safety practices in other countries. The Project will play a leading role in facilitating a process to support the Government the Project instituting dam safety policies, developing guidelines for dam safety monitoring and inspection, and establishing an independent dam safety center.
This sub-component will support the Water Management Secretariat (WMS) of the MASL(MMAIRD) and the Water Management Division of the Irrigation Department (ID) (MMAIRD) to strengthen data, analytical tools and the institutional arrangements and policies for bulk water allocation, preparation of seasonal operational plans (SOP), water distribution and monitoring.	Positive impacts: <ul style="list-style-type: none"> Improved integrated water resources management 	
This Sub-component will support the development of the Institutional framework and capacity, acquire and install	Positive impacts: <ul style="list-style-type: none"> Improved integrated water resources management 	

<p>the necessary technology and infrastructure, and establish a strategic groundwater management policy and regulatory framework to enable sustainable groundwater management in Sri Lanka.</p> <p>The sub-component would finance: a) Aquifer investigation including exploratory, observation and pump-test wells, mapping and productivity assessment of aquifers; b) Development of groundwater management tools, guidelines and regulations; c) Preparation of a groundwater management plan; d) Establishment of Provincial Groundwater Management Centers (PGWMC) that will have the role and functions to monitor, manage and protect the aquifers and their dependent ecosystems within the basins.; e) Build the capacity of the WRB and the Provincial Centers</p>		
<p>against a Risk Screening Index and all the proposed schemes were categorized as high to medium risk level on safety. The proposed project follows the bank financed Dam Safety and Water Resources Planning Project (DSWRPP) implemented over ten years from 2008 and successfully completed by the GoSL in 2018.</p>		
<p>Rehabilitation of dam and irrigation infrastructure: Activities will include remedial works to enhance safety as well as related irrigation canal systems that require rehabilitation to improve their operational efficiency and durability. Dam headwork repairs will typically involve rehabilitation of main dam bodies, spill ways, spill tail channels, toe drain, toe filter, rip rap and related structures.</p> <p>It will also finance:</p> <p>Preparation of Emergency preparedness plan (EPP) for critical dams based on systematic dam-break analysis, defining downstream possible inundation area, depth and duration. Results of the EPP will be discussed with</p>	<p>Positive impacts:</p> <ul style="list-style-type: none"> • Improved dam safety and water availability • Control of floods and other disasters such as land slides • Improved water productivity and the flow regimes <p>Negative impacts:</p> <ul style="list-style-type: none"> • Off-site impacts of quarrying, noise, vibration from construction and transport & debris disposal, disturbance to animals. • Removal of trees and vegetation will disturbed the riverine habitat and lead to soil erosion issues 	<p>Develop site specific EMPs (post suitable environmental analysis) that addresses all identified adverse impacts.</p>

<p>the local disaster management centers (DMCs) to establish the evacuation procedures in case of an emergency.</p> <p>New Farmer Organizations (FOs) to carry out water management, strengthen existing FOs, create awareness among the farmers in promoting water management, build capacities of the FOs to perform various functions, including technical, organizational, managerial, and financial; and provide periodic monitoring of the performance of these organizations and evaluation of the impact of capacity-building programs undertaken for them.</p>	<ul style="list-style-type: none"> • Burrowing of pits for building material pose an environmental concern as they can lead to safety hazards and cause erosion and siltation of water bodies and can also lead to reduced soil fertility. • Safety issues due to deep excavations and material piles • Emission of dust and air pollutants from equipment and machinery • Loosened soil structure and slope failures leading to landslide risks such as subsurface soil layers collapse and fail under outward seepage flow • Generation of spoil during rehabilitation may lead to obstruction of water flow, environmental pollution and pose a health risk. Blocking of existing drainage paths; erosion of material during rains. • Stock piling of building material in public areas may cause inconveniences to the community and the road network. • Temporary blockage and short-term increased siltation in the water bodies. • Dewatering can lead to livelihood losses, impact on sanitary water requirement of the region, disruption of migratory paths and temporary losses of habitats in aquatic species. Degradation of water quality; • Stock piling of dredged material, soil, debris; Blocking of surface drainage paths causing localized flooding; Odor problems; Smothering of benthic fauna and ground vegetation. 	
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	<ul style="list-style-type: none"> • Use of wrong construction material, use of inexperienced contractors leading to damage or over-restoration • Collapse of vertical soil faces; Increased susceptibility to erosion; Liquefaction leading to bank failures; Temporary distraction of fish Collapse of vertical soil faces; Increased susceptibility to erosion; Liquefaction leading to bank failures; Temporary distraction of fish • Consider environmental sensitivity of the area during the planning phase of water resources development projects. 	
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Other potential social impacts

- Though resettlement is not identified under this project at this stage, large scale interventions may require minimal land acquisition and resettlement. A separate Resettlement Policy Framework has been developed to address that.
- **Local Uncertainty:** The local population generally hears rumors or stories about water projects well before construction or even land acquisition. During this phase the community generally lacks accurate detailed knowledge of the proposed activities and feels serious concern about the effects that the project will have on them. Since land acquisition affects people's livelihood, this is a common matter for concern.
- **Severance and social disruption:** Water subprojects, especially with large reservoirs, can disrupt existing, long-established social relationships through making it physically difficult for people to move between houses or between communities. There is also the risk of affecting farmers' access to their farmland, or between one part of their land and another, making it difficult to move livestock and machinery from one part of the farm to another.
- **Disturbance to existing properties frontage, or public utilities.** Where new roads are created or existing roads are widened as part of the construction of a water supply or sewerage project, there are likely to be impacts on existing property frontages or on public utilities such as electricity supplies. These types of impacts involve costs, whether to individuals or to the community.
- **Unrest and dissatisfaction over distribution of labor opportunities and other benefits**
Water infrastructure rehabilitation projects generally involve significant employment of unskilled and semi-skilled labor and also provide opportunities for gaining training or experience, which provides access to future employment. If local communities see these advantages going to outsiders it can lead to conflicts.
- **Disease risk associated with workers in labor camps:** Workers in labor camps may be at risk of a number of diseases. These diseases may have an adverse impact on the project construction schedule, on the cost of the project, on the long-term health and income of the workers, and on the local population. Typically diseases and illnesses may either through a vector associated with water, as in the case of malaria, dengue fever, and schistosomiasis, or directly through disease organisms in the water supply to the camp as in the case of amoebic dysentery. Some of the workers may also be carriers of mosquito-borne diseases. Attention should also be paid to sexually transmitted diseases as well.
- **Increased risk of GBV due to labor influx:** as there will be labor influx in the project area, the likelihood of gender-based violence may increase and women's and girls' mobility and security may be affected.
- **Impacts on health and social well-being of local communities.** The considerations involved here are much the same as for the previous heading (Disease Risks to Workers in Labor Camps). However, in addition, where construction crews are from different ethnic backgrounds to the local community there is the potential for misunderstandings and clashes. These difficulties can exacerbate other minor irritations caused by the presence of the construction workers and might

lead to a lack of cooperation or even outright hostility. Where project workers remain in the area and become permanent settlers any small social frictions may develop into more open hostilities.

- **Labor camp may become a permanent settlement:** Labor camps that are located in the one place for long periods of time, particularly where workers have their families with them, tend to become permanent settlements. This applies more to the temporary unskilled and semi-skilled construction workers than to skilled employees. Since such camps are typically constructed as temporary facilities their amenities, e.g. for sewage disposal, are also of a temporary nature and not generally suited to long-term settlement. There is tendency for such settlements to take on slum-like characteristics. Where labor camps become long-term settlements they run the risk of adding significant demands to what may be already over-extended local infrastructure such as schools and health programs.
- **Illegal settlement resulting from improved access:** This set of impacts is much the same as those for the above heading (Population Increase as a Result of In-migration) and has the same causes. However, because it involves illegal settlement the long-term socio-economic and environmental impacts are likely to be greater, as are the impacts on local communities.
- **Hazard when quarry or pits are abandoned:** When quarries or borrow pits are abandoned after construction is completed they can become a hazard to local communities, either through the danger that they pose to people and livestock who might fall into them (whether full of water or not), or through disease risk resulting from the breeding of disease vectors (e.g. mosquitoes or snails) in water collected in them.
- **Aesthetic visual impacts of quarries and borrow pits:** Abandoned quarries and borrow pits can represent significant visual impacts on the landscape. Apart from the magnitude of the impact that these features cause directly, their presence can lead to an ongoing lack of consideration for visual landscape values in the area that encourages other similar impacts.
- **Aesthetics visual impacts of right of way on landscape:** Where water infrastructure development su projects there are access roads to these sub projects pass through areas of high scenic value the intrusion of the projects and associated earthworks and structures into the landscape may detract from those values.

Impacts of climate change

Sri Lanka has an extremely complex water management system spread across multiple government authorities and ministries, which leads to water management that is not sensitive to disaster resilience or the effects of climate change. In light of the prolonged agricultural drought, and the effect on the hydro-electricity generation, and irrigation, Sri Lanka is starting to examine ways to change its water

management³¹. As climate change-induced events become more recurrent and as new challenges emerge, such as the chronic kidney disease of unknown etiology, adversely affecting thousands of people, there is a need to go beyond what has been achieved so far³². Climate change is a growing problem in Sri Lanka. During the period 1961-1990, air temperature increased by 0.016 °C per year and annual precipitation decreased by 144 mm (7 %) compared to the period 1931-1960³³. Furthermore some studies have suggested a 17% reduction of rainfall in the upper Mahaweli watershed in the central highlands by 2025³⁴. The water demand could be affected by climate change, especially in terms of rainfall variability, increase in atmospheric temperature and other climatic factors resulting in water scarcity, an increase in irrigation demand, a deficit in soil moisture and an increase in incidences of floods and droughts³⁵.

National Climate Change Adaptation Strategy (NCCAS) has been developed in response to the growing concern of the negative impacts of climate change and climate variability on the country's social, economic, and physical environment. The National Climate Change Policy (NCCP) was formulated in 2012. The National Climate Change Adaptation Plan (NAP) was formulated in 2015. Sri Lanka has already started the NAP process and reached two important milestones, namely: the National Climate Change Policy (NCCP) and the National Climate Change Adaptation Strategy for Sri Lanka (NCCAS): 2011 to 2016 (NCCAS 2011-16). The National Climate Change Adaptation Plan (NAP) for the water sector identifies the following

- Enhance the resilience of systems for water supply, management and use to overcome the scarcities caused by climate change impacts
- Ensure the safety of water management to facilities and minimize disturbances to supply due to extreme weather events
- Minimize the impacts of sea level rise on water supply and management in coastal zone

Component 1 and 2 will form part a climate change adaptation strategy for the country addressing issues of water availability and quality exacerbated through climate change through enhanced and stronger river basin management and watershed resources management interventions. Component 2 will also support

³¹ UNDP. Sri Lanka. Retrieved 9 November 2017. http://www.lk.undp.org/content/srilanka/en/home/library/environment_energy/Coping-with-Climate-Change-and-Variability-Lessons-from-SriLankan-Communities.html

³² EU- Sri Lanka & IWMI. 2017. The Political And Institutional Context Of The Water Sector In Sri Lanka — An Overview. ISBN 978-92-9238-500-2

³³ Eriyagama, N., Smakhtin, V., Chandrapala, L. and Fernando, K., Impacts of climate change on water resources and agriculture in Sri Lanka: a review of preliminary vulnerability mapping, International Water Management Institute, Colombo, 2010

³⁴ De Silva, C. S. 2006b. Impacts of climate change on water resources in Sri Lanka. Paper presented at the 32nd WEDC International Conference, November 13-17, 2006, Colombo, Sri Lanka

³⁵ EU- Sri Lanka and IWMI. 2017. The Political And Institutional Context Of The Water Sector In Sri Lanka — An Overview. ISBN 978-92-9238-500-2

the countries resilience in water resources by improving dam safety, maximizing the storage capacities and minimizing the water losses from the irrigation systems. Watershed management helps combat the increasing risks of floods and droughts that affect the countries productivity.

4.1.4 Potential issues that require specific guidelines

Loss of ecological and productive values

Project such as watershed restoration, management, dam safety and related irrigation infrastructure improvements projects can have negative impacts on threatened animal and plant species, ecosystems and communities. It can alter existing landscapes and watersheds. These impacts are more common in the case dewatering of sections of rivers/canals/tanks during rehabilitation, disturbance to the riparian areas etc. At each subproject level and environmental screening shall be carried out with the involvement with CEA/Forest Department of Wildlife Conservation, as necessary, for potential impacts and possible mitigation measures depending on the flora and fauna that is affected. Under Component 1, a native species list should be developed for the areas and it should consider the stratification of the watershed before designing agroforestry programs.

Presence of project implementation workforce may lead to hunting or trapping of local wildlife. This may be done for relaxation or in order supplement protein in their diet. Impacts can be quite severe where there is a large workforce or where the local wildlife is rare and endangered. Such impacts can also affect local human populations where they make it more difficult for them to secure necessary protein supplies. Awareness programs should be in place and contractor bounded not to engage in such activities and hunting of game is not allowed. Risk areas should be identified during the safeguards assessments.

Disruption to animal movement will also have to be considered as the project spreads across the natural habitats of the country encompassing many forested areas. New access road for a water infrastructure projects and dam rehabilitation identified under component 2 and agro roads under component 1 of the project may cause disruptions to animal migrations. This usually occurs as a result of the break in the habitat that roads create and the impact will vary depending on the nature of the intervention and the sensitivity of the local environment. A wide range of animal groups can be affected, ranging from elephants to very small animals such as mice and squirrels. Where roads cross-waterways they can impact the migrations of aquatic species such as fish and frogs. Local knowledge of fish migrations and the water quality record prior to development activities will ensure that proper mitigations are adopted. Since animals undertake migrations in order to meet biological need (e.g. seasonally available food sources or breeding areas) disruption of migration routes can result in populations being isolated.

There is a potential threat of introduction of alien invasive species with the construction work. Seeds of weeds can also be brought into the project area with raw material such as soil and gravel that are brought into the project site from areas where such weed infestations exist. Therefore, the contractor must take

steps to keep the weed risk low by ensuring that all construction related vehicles are cleaned before they are being brought to the site and carry out regular inspections of material storage areas and construction areas for possible weed or alien invasive species infestations.

Soil erosion and sedimentation

Excessive erosion of soil and water containing pollutants such as cement, concrete and chemicals such as paints used for construction could contaminate the tank ecosystem. Therefore, mitigatory measures such as construction of bunds to prevent run off should be taken to prevent these surface water bodies from becoming contaminated with construction waste and erosion of the buds and canal banks.

Land preparation and construction will result in clearing of land exposing it to wind or water erosion both under components 1 and 2. Further storage of construction material and spoil arising due to construction work is also able to erode away resulting in sedimentation of water ways. Since all the work is carried in close proximity to surface water bodies, mitigation have to be adopted to prevent erosion and sedimentation of streams. Use of silt traps where possible and positioning stockpiles away from the tank to be rehabilitated. The status of the stockpiles is to be monitored daily and water sprays and screens to be placed where wind erosion is high.

Waste disposal leading to loss of habitat

Disposal of spoil material will be a major impact that would require carefully monitored mitigation as in watershed and irrigation areas impacts will be high. Unregulated disposal of spoil material from construction activities will lead to loss and degradation of habitat (highly significant in the case of sensitive habitats). One of the main sources of spoil will be desilting of irrigation canals which will generate large quantities of dredged matter that requires temporary as well as permanent disposal. Depending of the need for offsite disposal areas and the nature of the intervention, sediment sampling to characterize waste qualities of the dredged matter will need to be undertaken. Other waste generated that will require management is domestic solid waste, sewage and wastewater from labor camps/workers. If waste disposal is left unregulated, it can lead to contamination of ground water and surface waters in the project areas. The implementing partners will have to develop a waste management plan and work with the local authorities in the area to identify appropriate methods of disposal. The contractor should be bounded to be compliant with the above measures with possible environmental penalty enforced by the MASL for non-compliance.

Landslides and construction induced impacts

Landslides constitute a major natural disaster in the Kandy, Nuwera Eliya and Badulla districts and hence this risk will be very relevant in implementing component 1. Improper drainage in the project area with high rainfall and steep slopes can be highly vulnerable to landslides. landslides. Landslides are caused when mountain slopes are rendered unstable. While this can occur naturally, human induced features

such as bad land use practices in steep slopes, poor drainage, improper construction techniques, overloading of slopes, vibration from heavy traffic and displacement of rocks aggravate the situation and raise the landslide risk significantly. While activities that will exert significant construction pressure on the land from watershed management activities is not envisaged, the risk can be present and hence it would be necessary to assess it.

In order to guide future land-use and economic activity in hilly areas the National Building Research Organization (NBRO), which is the government authority for landslide disaster management, has prepared Landslide Hazard Zonation (LHZ) maps for vulnerable areas.. The LHZ maps assign risk levels to areas depending on susceptibility for land sliding. It is important for project proponent to work with NBRO as a basis for planning project work for site specific remedial measures when infrastructure development is undertaken in risky areas.

Burrowing of pits for gravel and other construction material.

Abandoned borrow pits and the associated risks are a serious environmental and social concern. Notable risk factors include: frequent sliding, loss of human and wildlife and ecosystem services, groundwater contamination, and loss of arable land. It is important to note where the borrow pits are going to be located to ensure it is not within sensitive areas. Also reclamation of borrow pits should be identified and the operators, host community and the government agency must agree and enforce reclamation of borrow pits soon after use. Borrow pits should be properly sited, planned and designed by professionals, with provision of appropriate safety measures. Reclaiming a borrow pit should be as important as opening a borrow pit, towards sustainable engineering and environment. See guidelines for borrow pit rehabilitation in the annexes.

Loss of livelihood

While the overall project aims to increase and diversify livelihood for people in the project area, temporary livelihoods should be anticipated during the implementation of the interventions. Livelihoods may be lost due to issues such as temporary loss of access and dewatering of tanks to carry out rehabilitation work. This will impact adversely on the wellbeing of the community. These will be identified during screening and alternative livelihoods should be identified for the local communities for the project implementation periods. They should be involved from the planning stage of the project in identifying alternative livelihoods. Back up plans should also be in place in instances of de-watering in event that the rains fail making the people unable to revert to their original jobs.

Impacts on physical cultural resources (PCR)

Items of archaeological, historical, and cultural value are important not only to local people but also as a source of tourism revenue, either now or in the future. It is therefore important that these values receive appropriate protection. The existence of archaeological sites is often unsuspected until artifacts are uncovered during construction work.

Kandy, Matale, Badualla and Nuwara Eliya and the Dry Zone cities are rich in cultural heritage and requires particular attention to mitigate any negative impacts on PCRs that can take place either directly or indirectly during project implementation. The PCRs are dominated by historic buildings, monuments, temples and monastic and ancient irrigation systems. For all areas, cultural heritage buildings and property have been inventoried and mapped by both the Department of Archaeology and the Central Environmental Authority and a strict historic building code is in practice which requires historic buildings to adhere to conservation guidelines. The project is not expected to lead to changes in demographic or settlement patterns that can lead to neglect of old areas containing historic centers, nor will it undertake large scale infrastructure construction that can damage known PCRs. Most of the project interventions will be rehabilitating, improving and building on existing infrastructure and could potentially trigger some of the typical impacts highlighted below;

- Direct physical damage during construction work and construction accidents
- Physical damage due to vibration, air, soil and water pollution caused by construction traffic, use of heavy construction equipment and possible use of explosives in road improvement work Indiscriminate dumping of waste that could cover and lead to aesthetic damages
- Temporary or permanent access restrictions
- Quarrying for construction material leading to damage and destruction of PCRs and changing of aesthetic quality of landscapes
- Establishment of worker camps leading to unregulated access to PCR sites, looting of valuable artifacts, accidental damage and vandalism

During subproject screening and environmental assessment, PCR sites within the area of influence shall be identified and precautionary measures that would be required identified. Where there is some likelihood that archaeological sites exist, an appropriately qualified person can be tasked with accompanying the equipment making the first earthworks, in order to identify sites of importance, as they are uncovered. There should be provision for work to be halted in a location for a defined period while the significance of uncovered sites is assessed. During such instances an archeological clearance should be sought from the Department of Archeology. If a PCR chance find is encountered, the procedures stipulated in Annex 4 will need to be followed.

4.2 General mitigation measures for potential environmental impacts

As highlighted above, environmental impacts from majority of sub-projects under MASL, ID, NPC and EPC will be associated with general construction related activities which can be effectively mitigated with good construction planning, site management, debris disposal and public safety practices. For such impacts, environmental best practices (relevant to the sub-project) as highlighted in the table below would be sufficient where impacts of a particular activity are minor and easily mitigated. As for, specific impacts such as those that could potentially arise from dredge material disposal, dewatering and

construction on landside sensitive zones will need specific guidelines to plan mitigation and should be carried out in consultation with the relevant authorities.

4.2.1 Environmental best practices for constructional impacts

For specific impacts of construction/ rehabilitation work, the table below provides some best practices for mitigation.

Type of Impact	Mitigation measures	Standards applied
Dust	<ul style="list-style-type: none"> • Regular watering of roads for dust suppression in urban, residential areas and in areas with sensitive receptors • Covering of excavated soil temporary stored on site • Daily cleaning of tires of vehicles • covering up any vehicle transporting materials and spoil to and from construction sites • Daily cleaning of streets and pathways in vicinity of construction site that are affected by soil and dust • Imposing speed controls for construction vehicles 	ICTAD Publications: SCA/5; SCA/3/1
Air pollution	<ul style="list-style-type: none"> • Employ construction machines with low emissions to reduce pollution, arranging sources of emission far from people's houses and public places • All construction machines and vehicles should meet the standard on emissions and have passed the emission test • No burning of wastes on site • Limit traffic congestion through proper planning and operating of traffic diversions • Do not let machines idle when not necessary 	ICTAD Publications: SCA/5; SCA/3/1; SCA/3/2; SCA/3/3; CEA Air quality standards;
Noise and Vibration	<ul style="list-style-type: none"> • Apply appropriate schedule to avoid any works that may cause noise and vibration during 10 pm – 6 am. Any nighttime activities should be done using noise reducing means or low-noise technologies • Use vehicles and equipment that meet standards for noise and vibration in Sri Lanka. • Publishing and registering working time of construction machines with local authorities and strictly compliance therewith. • Restricting use of noisy machines near sensitive receptors such as schools and hospitals, use noise-reducing means for construction machines, if required. 	ICTAD Publications: SCA/5; SCA/3/1; SCA/3/2; SCA/3/3; CEA noise & vibration standards

Solid waste (demolition, construction And excavation)	<ul style="list-style-type: none"> • Work sites should be cleared of residual solid waste and wastewater before work commences • Temporary storage of solid wastes shall be done with appropriate containment to avoid spreading of waste, odor and avoid dust • Temporary storage of solid waste should be done to avoid interfering with traffic obstacles and aesthetics • Sites for collecting solid waste in each sub-project area should be determined prior to commencement of construction. These sites must be suitable with the transport, in order not to obstruct the activities of human beings and the waste must be transported during the day • Construction wastes should be removed as much as possible within 24 hours from the site to ensure public safety in urban areas • All waste should be collected and disposed in compliance with the local and national laws, in sites identified by the respective LA • Excavated soil, if suitable, should be used for leveling and Backfilling • No solid waste can be burned at the site • Clean the construction site of solid wastes, wastewater etc. before its closing 	ICTAD Publications: SCA/5; SCA/3/1; SCA/3/2; SCA/3/3;CEA Guidelines on Solid Wastes
Domestic Waste	<ul style="list-style-type: none"> • Construction camps should be sited appropriately with consent from the necessary public authority or the implementing agency, • Labor camps shall be provided with adequate and appropriate facilities for disposal of sewage and solid waste • Domestic solid waste shall be collected and disposed of daily at the LA designated site or given for collection by the LA • Discharge and disposal domestic waste from worker camps into water sources should be strictly avoided • Burying and burning domestic waste in the project site should also be strictly avoided • Avoid construction workers staying overnight in the construction sites 	ICTAD Publications: SCA/5;SCA/3/1;SCA/3/2; SCA/3/3;CEA guidelines on Solid Wastes, Code of practices by SLSI
Dredge Material	<ul style="list-style-type: none"> • Dredge material identified as contaminated will need special handling, transportation and disposal. For contaminated sites, confirmed by the on-going sediment quality analysis, a dredge material disposal plan will need to be prepared. • The contractor should be trained and made aware of the requirements prior to commencement of the sub-project. 	ICTAD Publications: SCA/3/3; EPA guidelines on dredged material

	<p>Special guidelines for handling of contaminated dredge material should be prepared and published by the PMU.</p> <ul style="list-style-type: none"> Dredge material that are uncontaminated should be either dumped on-site for canal/lake bank stabilization or removed to landfill/dumpsite designated by the LA/CEA as appropriately. 	
Oil and Lubricant Waste	<ul style="list-style-type: none"> Oil and lubricant waste should not be buried or burnt in the project site, but collected and stored in proper oil-cans and disposed for re-use or LA approved designated sites. 	<p>ICTAD Publications: SCA/5; SCA/3/1; SCA/3/2; SCA/3/3</p>
Soil Erosion	<ul style="list-style-type: none"> Earthwork should be carried out during dry weather periods and all exposed surfaces should be covered with suitable grass species (turf) to prevent siltation in canal/lake beds Stockpiling of earth should be done a safe distance away from waterways. Other construction materials containing small/ fine particles shall be stored in a place not subjected to flooding and in such a manner that these materials will not be washed away by runoff. If necessary, silt/sedimentation traps should be used to prevent soil particles from getting into drains and canals 	<p>ICTAD Publications: SCA/5; SCA/3/1; SCA/7</p>
Extraction of earth and quarry	<ul style="list-style-type: none"> All quarry/burrow sites operated by the contractor should be licensed with the LA/CEA/GSMB, as appropriate. All burrow pits /areas shall be rehabilitated at the end of their use by the contractor in accordance with the requirement of the EMP or as instructed by the Engineer of the IA. Establishment of burrow pits/areas and its operational activities should not endanger properties and cause a health hazard to the people At contract closing, all burrow/quarry sites should be fully Rehabilitated. If contractor would procure earth/quarry material, he should do so from sources that are operating with the required licenses 	<p>ICTAD Publications: SCA/5; SCA/3/1;; SCA/3/3, GSMB guidelines</p>
Traffic Congestion	<ul style="list-style-type: none"> All sub-project should have a traffic management plan Temporary home and business accesses should be provided where necessary and transport along main roads during rush hours should be avoided where possible Temporary access roads should be identified before construction begins and upgraded if necessary. 	

	<ul style="list-style-type: none"> • All roads and access sites must be restored to their original state as soon as possible. • Speed limits and operating times for the construction vehicles should be imposed. • Travel route for construction vehicles should be designed to avoid areas of congestion. • If project works occur after dark, a lighting system should be maintained such that vehicles and pedestrians can clearly see the construction area. • One-way flow of traffic should be promoted whenever Practical • Contractor should supply traffic co-coordinators to manage traffic flow in areas that are subject to congestion. • Project should maintain fences throughout construction areas. These fences should define clearly the construction boundary that does not occupy the remaining road and ensure traffic flow in residential areas. • Awareness programs can be conducted on safety and proper traffic behavior in densely populated areas near the construction sites. 	
Access roads	<ul style="list-style-type: none"> • Before construction, the pre-project state of site access roads should be recorded by the project/contractor. • During construction, site access roads should be inspected regularly and repairs made as required • After construction, site access roads used by the Project should be inspected and compared to records taken during Pre-construction. • If notable road quality differences exist, the road should be repaired to its original condition 	ICTAD Publications: SCA/5; SCA/3/1; SCA/3/2; SCA/3/3
Health and Safety	<ul style="list-style-type: none"> • SEE SEPARATE SECTION ON HEALTH AND SAFETY BELOW 	ICTAD Publications: SCA/5; SCA/3/1; SCA/3/2; SCA/3/3, Guidelines of Department of Labour, IFC, General Environmental, Health and Safety Guidelines

Impacts on flora and fauna	<ul style="list-style-type: none"> • A compensatory tree planting program should be developed to replant native species wherever available space beside the proposed project. • Workers should be instructed to protect flora and fauna including aquatic life as well as their habitats. • Hunting and poaching should be strictly prohibited. • Washing, maintenance and service of vehicles and machinery should not be done closer to the freshwater habitats. • Solid waste, construction debris should not be dump into wetlands. 	ICTAD Publications: SCA/5; SCA/3/1; SCA/3/2; SCA/3/3; SCA/7, CEA, Department of Wildlife and IUCN guidelines
Impact on water resources	<ul style="list-style-type: none"> • Identification of the reliable water resources and obtain necessary approvals from the relevant authorities to extract water prior to commencement of construction work. • Contractor should not obstruct or prevent water flow when working closer to water bodies. • Silt traps and erosion control measures should be used where the construction carry out closer proximity to the water bodies to avoid entering of construction materials water bodies to avoid entering of construction materials which cause turbidity and sediments. • Construction material and stock piles should be covered to avoid wash off to water bodies. 	ICTAD Publications: SCA/5; SCA/3/1; SCA/3/2; SCA/3/3, Mahaweli, Irrigation Department guidelines
Dewatering of water bodies	<ul style="list-style-type: none"> • Calculated the environmental flow release and adopt mitigatory measures to ensure ecosystem sustainability • Livelihood impacts due to temporary water scarcity should be calculated and provide alternative sources of income to the community • Provision of water to people who may temporary loss of water due to the construction 	Mahaweli, Irrigation Department guidelines
Worker Camps	<ul style="list-style-type: none"> • Mobilizing maximum capacity of skilled and unskilled labor force from the surrounding project area • Identify location of camps with consultation of LA. • Camps should not be located near water ways, human settlements or near drinking water intakes. 	ICTAD Publications: SCA/5; SCA/3/1; SCA/3/2; SCA/3/3 Code of practices by SLSI

4.2.2 Health and Safety Guidelines

Health and safety of workers and the public should be designed into intervention implementations, before, during and after the building phase. It is cheaper and easier to control risks of construction to workers by proper planning, training, site induction, worker consultation and incorporating strict safety procedures in construction plans. Extreme dangers posed by working in environments such as great heights, deep water and involving dangerous chemicals and radioactive material will not be present. Potential dangers associated with project sites will include falling from moderate heights, vehicle/pedestrian accidents, falling into trenches, being buried in tunnels/excavations, breathing dust and other air pollutants, back aches caused by handling heavy material, suffering hearing loss from noise etc. and can be mitigated with the following safety guidelines.

EA for each site should mandatorily include a risk assessment as to what are the hazards involved in the work site, who might be harmed and how seriously, how likely this harm might happen and what actions are required to eliminate or reduce the risk and incorporate such measures in the. These should be clearly set out in the tender documents. All sub-projects must observe health and ESMP safety regulations, hence during implementation it is important to check if these control measures are put in place meet the legal requirement.

Training

- Ensure contractor carry out suitable training programs on occupational health and safety for all workers involved prior to commencement of construction.
- Ensure only experienced and well trained workers are used for the handling of machinery, equipment and material processing plants.
- Ensure all persons, including managers, are trained and able to carry out their work without risk to the safety or health of themselves, other workers or the public.

Personal Protective Equipment

Safety equipment, tools and protective clothing shall be provided to workers and safe working methods are shall be applied. A safety inspection checklist will be prepared taking into consideration what the workers are supposed to be wearing and monitored.

- Person who works or operates in an area where there is a risk of flying objects, such as splinters, should wear safety goggles at all time. These should be securely fitted to the face. Welders should protect the entire face from hot sparks and bright rays by using a welding mask.
- Person exposed to high levels of dust or hazardous gases shall wear respiratory protection in the form of disposal masks or respiratory masks which fit more snugly around the nose and mouth.
- Person working in an area where there is the risk of being struck on the head by a falling or flying object should wear a hard hat at all times. These should be well maintained in order to be fully effective, and any helmets or hard hats that are damaged or cracked should immediately be replaced.

- Workers will be required to wear shoes or strong boots to prevent sharp objects from penetrating or crushing the foot. Those working in muddy conditions and in canals with polluted water should avoid hand/foot contact with water and should never wear slippers.

Site Delineation and Warning Signs

- Ensure delineation devices such as cones, lights, tubular markers, orange and white strips and barricades are erected to inform oncoming vehicular traffic and pedestrians in the area about work zones.
- Ensure all digging and installing work items that are not accomplished are isolated and warned of by signposts and flash lamps in nighttime.
- Ensure dangerous warning signs are raised to inform public of particular dangers and to keep the public away from such hazards.
- Ensure rehabilitation of trenches progressively once work is completed.
- The safety inspection checklist must look to see that the delineation devices are used, whether they are appropriately positioned, if they are easily identifiable and whether they are reflective.

Equipment safety

- Work zone workers use tools, equipment and machinery that could be dangerous if used incorrectly or if the equipment malfunctions. Inspections must be carried out to test the equipment before it is used, so that worker safety can be secured. Inspections should look for evidence of wear and tear, frays, missing parts and mechanical or electrical problems.

Emergency Procedures

- Ensure an emergency aid service is in place in the work zone.
- Ensure all site staff is properly briefed as to what to do in the event of an emergency, such as who to notify and where to assemble for a head count. This information must be conveyed to employees by the site manager on the first occasion a worker visits the site.

Construction camps

- Ensure installation of adequate construction camps and sanitation facilities for construction workers to control of transmission of infectious diseases.

Information management

- Develop and establish contractor's own procedure for receiving, documenting and addressing complaints that is easily accessible, culturally appropriate and understandable to affected communities.
- Provide advance notice to local communities by way of information boards about the schedule of construction activities.

Worker consultation

- Consulting the workforce on health and safety measures is not only a legal requirement; it is an effective way to ensure that workers are committed to health and safety procedures and improvements. Employees should be consulted on health and safety measures and before the introduction of new technology or products.

4.2.3 Mitigation of environmental impacts caused by the disposal of dredge material

Large scale dredging is not envisaged under the project, however a brief account is provided in event a need arises. The potential environmental effects of dredging are generally two-fold, firstly as a result of the dredging process itself and secondly as a result of the disposal of the dredged material. During the dredging process impacts may arise due to the excavation of sediments at the bed, loss of material during transport to the surface, whilst loading and during transport to the designated location and will include removal of benthic communities, short to medium term changes in the water quality with increased turbidity and the possible release of organic matter, nutrients and or contaminants smothering of fish and other fauna by settling suspended matter etc.

The second is the impact of dredged material disposal which largely depends on the nature of the dredged material (inorganic, organically enriched, acidic, contaminated) and the characteristics of the disposal area (geology of the land, accumulative or dispersive areas in the case of open sea dumping). Dredging would generate large volumes of sediments and sludge, the quality of which would determine how and where it can be disposed to. Haphazard disposal of contaminated dredge material can lead to many adverse environmental and public health risks, and as such the project must adopt a cautious

Under the project desilting of irrigation tanks and canals would be supported. As such, the irrigation Department (ID) and MASL, will conduct the necessary field sampling and laboratory testing through a competent authority hired in order to perform this exercise. The test data should be reviewed together with the World Bank and regulatory agencies such as the CEA and/or CCD, as the need be, and the method of disposal should be discussed. **It important that dredge material is evaluated and then select the disposal alternatives.** Depending on the degree of toxicity, disposal options could be decided. In the case of a positive determination, disposal would be carefully planned and the subproject would need to prepare a Dredge Material Disposal Plan (DMDP). It is important to check the suitability of the sediments for different alternative disposal/use options. While Sri Lanka does not have any standards for sediment quality or regulations to control disposal of such material, it is important that a regularized method be adopted for dredge matter that could contain toxic pollution.

4.2.4 Mitigation of landslide hazard

All interventions under the project that would be implemented in the landslide vulnerable zones and that would involve large scale earth works that could potentially heighten the risk of land landslides should adhere to following;

- Existing landslide hazard should be assessed using the NBRO Landslide Hazard Zone (LHZ) map
- Where risk is moderate to high, NBRO should be consulted early in the design phase
- Selection of site specific mitigation measures must be discussed and all technical designs should be vetted by the NBRO
- NBRO recommendations should be incorporated into the final technical design
- NBRO's clearance and supervision during project implementation must be obtained.

4.2.5 Guidelines for mitigating and minimizing anticipated adverse impacts on Physical Cultural Resources

Under IWWRMP, the expected impacts on cultural resources will be minimal, if at all, as it will not involve new large-scale development. The initial impact assessment will be undertaken as part of the environmental screening identifying significant sites in the projects area of influence. This would involve a site inspection and reference to maps of heritage building, property and landscapes prepared by the DoA (Department of Archeology) and the CEA. The goal of environmental screening is to determine the presence or absence of PCR sites within the project boundary and its area of influence. If the screening confirms the presence of PCRs which could possibly be affected, the team will use the PCR screening form (see annex) to describe the extent, character and ownership of the PCR, investigate the significance of it and evaluate the scope for impacts on each site in the event of project proceeding and document them. During the PCR screening the team will assess the need to carry out a full-scale Archaeological Impact Assessment (AIA) under the local law and make its recommendations to the project proponent. Depending on the significance of impacts to PCRs identified through the screening either an AIA (under the Antiquities Act) or an ESMP that incorporates measures to avoid, minimize and mitigate the identified impacts will need to be prepared. Depending on the significance of the PCR, its ownership and location (ex within or outside UNESCO site boundary), ESMPs may need to be reviewed and cleared by the DoA or the UNESCO Heritage Committee for the city.

In determining the scope and significance of the impact, following aspects are important to be considered.

- **Magnitude:** The amount of physical alteration or destruction that can be expected. Resultant loss of archaeological value is measured either in amount or degree of disturbance.
- **Severity:** The irreversibility of an impact. Adverse impacts, which result in a totally irreversible and irretrievable loss of archaeological value, are of the highest severity.
- **Duration:** The length of time an adverse impact persists. Impacts may have short-term or temporary effects, or more persistent, long-term effects.
- **Range:** The spatial distribution, whether widespread or localized, of an adverse effect.

- **Frequency:** The number of times an impact can be expected.
- **Diversity:** The number of different kinds of project-related actions expected to affect a site.
- **Cumulative effect:** A progressive alteration or destruction owing to the repetitive nature of impacts.

The best outcome is the avoidance of any impact on archaeological values. Mitigation is required only in situations where unavoidable conflicts are identified between PCRs and a proposed development. It is recommended that highly significant sites are avoided by re-routing the construction trace or changing the construction footprint. For other sites where impacts are unavoidable it will be important to record the condition of the PCR and then use a combination of strategies such as protection using barriers, salvation and relocation of removed cultural resources using relevant expertise, increasing cultural awareness and setting standards of behavior for project personnel to prevent illegal acquisition and exporting of material etc to name a few can be used. When recommending suitable strategies it is important to involve cultural heritage specialists in the assessment team and to consult the DoA, as necessary.

Recognition of unknown PCRs and chance finds procedures

Contracts for civil works involving earth moving and excavation activities, especially in known archaeological and heritage areas, should normally incorporate procedures for dealing with situations in which buried PCRs are unexpectedly exposed. Chance find is the most difficult aspect to cover, especially if the contractor is not full-time accompanied by a specialist. For framework contracts, an initial consultation with the Department of Archaeology should be held before work commencement to identify the likelihood of such material being uncovered, especially where trenching work is expected for pipe laying and water infrastructure development etc.

Upon discovery of such material during execution of work, the contractor should carry out the following;

- Immediately stop construction activities.
- With the approval of the resident engineer delineate the discovered site area.
- Secure the site to prevent any damage or loss of removable objects. In case of removable antiquities or sensitive remains, a night guard should be present until the responsible authority takes over.
- Through the Resident Engineer, notify the responsible authorities, the Department of Archaeology and local authorities within 24 hours.
- Submit a brief chance find report, within a specified time period, with date and time of discovery, location of discovery, description of finding, estimated weight and dimension of PCR and temporary protection implemented.
- Responsible authorities would be in charge of protecting and preserving the site before deciding on the proper procedures to be carried out.
- An evaluation of the finding will be performed by the Department of Archaeology who may decide to either remove the PCR deemed to be of significance, further excavate within a specified distance of

the discovery point and conserve on-site, and/or extend/reduce the areas demarcated by the contractor etc. This should ideally take place within about 7 days.

- Construction work could resume only when permission is given from the Department of Archaeology after the decision concerning the safeguard of the heritage is fully identified.

4.2.6 Labor management

Labor management will be an important consideration under this project especially if they are brought in from outside areas. This will require labor camps and the associated negative impacts discussed earlier. Location of labor camps should be approved by the Consultant Engineer and comply with guidelines/recommendations issued by CEA and LAs. Contractor should handle and manage waste generated from construction/labor camps without contaminating the environment or without risk to public/communities living near the sites. Proper solid waste disposal, sanitation and sewerage facilities (drinking water, urinals, toilets and wash rooms) should be provided to the site of construction/labor camps. Illegal felling of trees and hunting of wildlife will be strictly banned.

Issues such as child labor, discrimination between ethnic groups/ origin of labor source and labor camp management may arise. Gender based violence (GBV) risk may become higher due to labor force influx. All laws on child labor will be applicable and good housekeeping practices including cleanliness and equity among all workers will be have to be practices to ensure smooth functioning. Special attention should be paid if labor is brought in from other areas of the country as they will require accommodation, transport, etc.

All workers should be educated on the required code of conduct (including expected behavior, sexual harassment, discrimination, noise, theft, etc.) by the Contractor prior to commencement of work at the subproject sites. Labor force if brought in from outside, will have to be provided with adequate and appropriate labor camps. labor camp settings and facilities will have to be drawn up by the contractor,

4.2.7 Livelihood support assistance

The project will have anticipated impacts on livelihoods both positive and negative. Negative impacts are expected to be temporary mainly during the period of intervention. Examples are during dewatering where fishing communities and agricultural communities will be affected. Also, loss of access due to interventions is expected.

The project should include a thorough analysis of livelihood impacts and provide a support mechanism to the affected persons. Consultations should be carried out with the community and preferences identified for alternative livelihoods. Project could engage these people in the intervention activities. Impacts on the loss of livelihoods on women and children in the area should also be considered. More specific guidelines on livelihood support is provided in the RPF.

4.2.8 Ensuring safety of Dams

Since 2008 to date, the GOSL has been implementing a national dam safety program, with financial assistance from the World Bank through the Dam Safety and Water Resources Planning Project (DSWRPP). Under this program many risk mitigation strategies were followed by the GOSL in ensuring safety of dams during rehabilitation and post-rehabilitation operation. The same approach would be adopted by the IWWRMP making use of the experience and the background work laid by the preceding DSWRPP. In summary, dam safety strategies followed by DSWRPP which would become relevant to IWWRMP are;

- During the preparation of the DSWRPP, the GOSL employed international consultants and local experts to assess the safety risks of all major dams of the country. Based on this assessment, a total of thirty-two (32) major dams identified with high and moderate safety risks were selected for intensive safety remedial interventions under the DSWRPP. Subsequently, the GOSL added thirty (30) more dams to the program for safety improvement interventions with the additional financing approved in 2014.
- Under the DSWRPP, the GOSL has engaged international consultants and local experts acceptable to the Bank to: carry out (i) full level dam safety inspections and geotechnical and hydrological studies; (ii) design safety assurance and remedial works; (iii) install dam safety monitoring instrumentation; (iv) supervise the execution of civil and electromechanical safety assurance works; (v) and prepare detailed operation and maintenance manuals for the dams included in the project.
- In addition, the designs and execution of the civil and electromechanical works and instrumentation were carried out under the guidance and supervision of an **Independent Dam Safety Review Panel** with a ToR approved by the Bank. This panel consists of technical professionals from related engineering disciplines and has been endorsed by the Bank.

The records of technical inspections and investigations, hydrological studies, detailed designs of dam safety remedial works, construction drawings, and O&M manuals are available with the concerned dam owner implementing agencies, the Irrigation Department and the Mahaweli Authority of Sri Lanka. In addition, projects financed by the GOSL and other donor agencies have conducted rehabilitation work on medium-small scale dams across the country, predominantly in the Northern and Eastern Provinces, over the last decade. Given that there is an ongoing and effective dam safety program targeting all large to medium scale Dam's, it can be established that full-level inspections, dam safety assessments, and safety remedial measures have either already been conducted and details are documented by the GOSL satisfactorily to the Bank, or will be done for those that have not yet been assessed for risk following procedures and guidelines set by the two dam owning department.

The Environmental Specialist will need to collaborate with field offices (Provincial or District) belonging to the Irrigation Department/Mahaweli Authority. Post the screening, in the presence of upstream hydrologically connected dams, which have not been rehabilitated or strengthened and thus have Dam Safety implications, the following steps will need to be taken.

- (a) an inspection and evaluation of the safety status of the existing dam, its appurtenances, and its performance history;
- (b) a review and evaluation of the mandated dam owner's operation and maintenance procedures, and

(c) preparation of a written report of findings and recommendations for any remedial work or safety related measures necessary to upgrade the existing dam to an acceptable standard of safety. When substantial remedial work is needed, these will be undertaken using the following procedure;

- A competent professional will be hired to design and supervise the work

Chapter 5 – Environmental and Social Impact Management Framework

5.1 Environmental and Social Safeguards Processing Steps

Implementation of environmental requirements will **typically** follow the steps outlined below closely linking with design and implementation phases of each sub-project.

Step 1	Environmental and Social Screening of Identified Physical Subprojects
Step 2	Preparing Environmental and Social Safeguard Assessments, Management and Monitoring Instruments
Step 3	Concurrence and Clearance
Step 4	Inclusion of Environmental Specifications and Environmental and Social Management Plan in bid documents
Step 5	Environmental Method Statements and ESHS Performance Clauses (for large investments)
Step 6	Compliance Monitoring and Reporting

5.1.1 Environmental and social screening of subprojects

Environmental screening is a useful tool in identifying environmental and social safeguard issues in large investment project consisting of many sub-projects that cover multiple sectors. As such, all sub-projects under IWWRMP that involve physical interventions will be subjected to an environmental and social screening using the respective forms provided in Annex 4. The main objective of Environmental and Social Screening of sub-projects will be to (a) determine the anticipated environmental and social impacts, risks and opportunities of the sub-project (b) to determine anticipated impacts on the local communities (c) determine if the anticipated impacts and public concern warrant further environmental and social analysis, and if so to recommend the appropriate type and extent of Environmental and Social Assessment needed.

At the national level, screening is the process by which proposed developments are reviewed to determine the level of environmental and social assessment to which they should be subjected, which could range from none up to a full Environmental Impact Assessment (EIA). At the project level, screening is the process of reviewing a proposed activity against a checklist of factors to determine whether it is likely to have adverse environmental and social effects, and if so, what mitigation measures should be applied.

Screening should go hand in hand with the project concept development. This way environmental opportunities and risks can be appropriately and easily integrated into subsequent design stages, rather

than later part of the project cycle when it may be too late or too costly to influence designs to reflect better environmental sustainability. The environmental screening report (ESR) should be prepared by an environmental expert/s with field visits and available data and information (implementation arrangements are given in the subsequent chapter. The subsequent sections provide recommendation on the level of environmental analysis for selected activities as broad guidance; however, the final judgment will be made post the screening exercise. Once the report is ready it will be made available to the project implementing agency to take necessary actions particularly in relation to the recommendation given in the report regarding environmental and social mitigations to be adopted.

Screening Method

Preparation of the screening reports will be conducted in four distinct stages, namely (i) field visits, data collection and stakeholder consultation; (ii) data analysis and interpretation; (iii) impact identification; and (iv) filling the screening including recommendations for next steps. The methodologies for each of these steps are explained briefly below. The proposed screening report format is given in Annex 4.

❖ Data collection and stakeholder consultations

Data for this study will be primarily collected through field visits, discussion with stakeholder agencies and literature reviews. The Literature Survey will broadly cover the following aspects and attributes necessary for environmental social screening:

- Project details/ Reports/ Maps/ documents including design details available with the implementing agencies
- Literature on flora/ fauna/ biodiversity/land use/soil/geology/ hydrology/ climate /socio economic profiles and environmental planning collected from GOSL agencies
- Hydrological/ rainfall/ drainage datasets
- Population characteristic within study area including gender

❖ Field Visits

Each sub-project site will be visited by the expert/s filling the screening form together with representatives from the implementing agency. They will further assess the existing environment (physical, biological and socio economic environment) and gather information with regard to the proposed sites and scale of the proposed sub projects and any prevalent issues. During these visits rapid reconnaissance surveys will be conducted in order to record the faunal, floral diversity, where necessary, to verify and support information gathered through the literature survey.

❖ Focus Group Discussions/ Meetings:

Focus group discussions will be carried out with other stakeholder agencies (as the expert will represent the project proponent sub-project related technical discussions are expected to take place internally) and local authorities to discuss pertinent issues. In addition, the public will be consulted (at least 5 such consultations in each site) to record their views and opinions about the proposed MHASL and the given

site-specific investments. This process will also identify any social concerns anticipated for the project areas.

❖ **Data Analysis and Interpretation**

Data collected from field visits and stakeholder discussions will be analyzed by the expert and discussed with the technical team of the project proponent for feedback.

❖ **Impact identification**

This will be carried out by the project proponent's expert through discussion with the technical team and data collected from the stakeholder consultations. At this stage the level of detailed EA required for the subproject will be identified depending on the categorization of the subproject.

❖ **Filling screening reports**

The screening report will be filled with details on the proposed project intervention, physical/ecological baseline conditions of the site, assessment of potential impacts, feedback from public consultations and recommendations for the type of environmental assessment required. If the findings confirm that anticipated impacts are not significant enough for a stand-alone EA and that an ESMP would suffice to mitigate the likely impacts, the screening exercise would be completed with the preparation of a site specific ESMP. If the likely impacts are significant and would require greater environmental analysis, the screening report would recommend (i) the appropriate type of assessment for the implementation agency to carry out and (ii) specific skills and expertise needed in order to carry out such assessments (*such as Biodiversity Specialist, Hydrologist, Environmental Economist, Ecosystem Service Specialist*) before designs are finalized.

Annex 3 provides guidelines for ESMP preparation. The Generic ESMPs are presented in Annex 5 which should be used in presenting mitigation to identified impacts due to the proposed sub-project activities.

5.1.2 Subproject criteria for screening

Developing criteria for screening and assessing anticipated impacts for all sub-projects are categorized into generic themes based on the nature of work proposed, as presented in the preceding section. The following table provides a template of a typical screening (anticipated outcomes based on potential environmental risks/impacts involved) and classifying all sub-projects in the pipeline in accordance with (a) safeguard categories of OP 4.01 and (b) recommended type of environmental analysis and/or feasibility studies (commensurate with the magnitude of potential impacts and risks) to be undertaken for each type of investment under IWWMP. According to this table it is evident that most of the sub-projects typically belong to safeguard Category B and do not need rigorous environmental studies to be undertaken and only the screening report with a site specific ESMP would be adequate. Hence project proponents are requested to refer to the ESMF to be informed on the level of environmental analysis that would typically be necessary to be undertaken prior to commencement of the project. **It is extremely important to note that this table has been prepared as only a broad guidance to the PMU on possible**

screening outcomes commensurate with typical environmental and social risks/impacts associated with each investment category and should be reevaluated at the time of actual screening. The final decision will be based on the actual screening that will be undertaken for each project along with appropriate site investigations.

Anticipated Screening Outcomes for Proposed Sub Projects

Project component	Proposed Interventions	Safeguard Analysis needed
Component 1	Proposed interventions include a deep dive into technical analysis followed by the preparation of management plans at the Divisional secretariat level watersheds. These watershed plans will include on-farm and off-farm activities for soil erosion control such as soil bunding, trenching, construction of stone walls, agro forestry, home-garden improvement, increasing broad leaf forest cover, forest boundary demarcation, drainage management, water harvesting, landslide stabilization and other small-scale infrastructure activities.	<p>Safeguards analysis for this component is recommended to be applied as follows:</p> <ul style="list-style-type: none"> ❖ Screening of all mini-watershed plans using the ESSR format provided in Annex 4 ❖ For simple on-farm soil and water conservation activities such as drainage line treatment, soil bunding, stone wall construction, terracing, water harvesting etc and vegetative treatment such as trenching, planting of ground cover/native trees, home gardening etc which are small-scale and community driven <p>Environmental Codes of Practice (ECoPs) would be recommended. (Please see Annex 6 for some relevant ECoPs covering a sample of typical on-farm soil and water conservation activities. These example ECoPs provided in the ESMF should not be treated as final but should be improved and supplemented on a continuous basis by the PMU for other types of on-farm activities that the mini-watershed plans will identify)</p> <ul style="list-style-type: none"> ❖ For off-form water and soil conservation activities such as water

		<p>harvesting structures, drainage management structures including dykes, diversion drains, leader drains, main drains, check dams and clearance of silt exacerbated by intense rain events etc that will be implemented at a regional scale (such as the plantations), Environmental and Social Management Plans (ESMPs) would be recommended.</p> <ul style="list-style-type: none"> ❖ For large scale reforestation activities (for example more than 5 ha) that would involve land clearing, soil improvement, replacement with broad leaf forest species, a limited Environmental Assessment (EA) or Initial Environmental Examinations (IEE) would be recommended. The PMU is expected to use discretion here in terms of justifying an EA (or lesser analysis) using ESR outcomes and area of influence.
Component 2	<p>The proposed interventions will include rehabilitation of dams and associated irrigation infrastructure in 55 schemes managed by the ID, MASL, EPC and the NPC. Remedial work on dam headworks will follow the exact type of activities that were funded by the recently closed DSWRPP and will typically include reinstating dam bund to design parameters, replacement of rip rap, improvements to access roads, toe filter and toe drain, repairs to sluice gate, repairs to electro mechanical parts and instrumentation upgrades.</p>	<p>Safeguards analysis for this component would include:</p> <ul style="list-style-type: none"> ❖ Screening and preparation of the ESSR for all dam and canal rehabilitation works. ❖ In most cases the preparation of an ESMP post the screening would suffice unless otherwise determined by the screening decision. ❖ The ESMP would particularly focus on rehabilitation of burrow sites and provide specific guidance on how

	Rehabilitation of irrigation canals will typically include widening and deepening to design levels, improvement to embankments and cross structures and other measures to reduce water loss and increase conveyance.	best to use and close identified earth and gravel burrow sites. ³⁶
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5.1.3 Preparing Environmental Safeguard Assessments, Management and Monitoring Instruments

Environmental Assessment (EA)/Initial Environmental Examinations (IEE)

EA and IEEs are effective tools for evaluating the environmental risks and opportunities of project proposals and improving the quality of outcomes. If the screening decision for any of the activities under Components 1 and 2 identifies substantial environmental impacts an EA/IEE should be carried, ideally targeting to coincide with the end of the preliminary design phase so that the impacts of each planned activity can be evaluated, and alternatives can be worked out for activities that have major impacts. The outcomes of the EA/IEE should then be used to finalize the project design which should ensure that the impacts of the given project are minimal. The importance of this management tool as means of foreseeing potential environmental impacts caused by proposed projects and its use in making projects more suitable to the environment has been highly effective.

If a specific subproject requires EA/IEE, the PMU should assess the need to get CEA clearance under the National Environmental Clearance. It is unlikely that any of the activities under component 1 and 2 would require national environmental clearance, however, in the event it does the PMU should follow the due process. The best time for a project proponent to submit the preliminary information on the proposed sub-project to the CEA is as soon as the project concept is finalized, and the location of the project is decided.

³⁶ During DSWRPP, which undertook the remediation of several large to medium scale dams in Sri Lanka, interventions at each dam site was assessed with a detail EA. The key lesson learnt from this experience is that environmental impacts from the type of dam repairs carried out under DSWRPP (and now proposed to be extended to several additional dams that could not be completed under DSWRPP) aren't extensive. They are localized, temporary and easily manageable with good construction planning and management. The key issue identified through the EAs was the selection and management of earth and gravel burrow sites. Therefore, learning from DSWRPP the level of analysis for dam work under SLWRMP is proposed to be further streamlined and to focus on specific issues such as burrow site management.

Once the environmental screening is conducted for the subproject the following steps need to be taken.

- For sub-projects that require EA\ IEE as per NEA the Terms of Reference issues by the CEA will be reviewed by the World Bank's Task Team and World Bank safeguards requirements as per the EMF will be included in the same TOR to align the processes and ensure there is no replication of instruments.
- For projects that do not require EA\IEE as per NEA but warrant Environmental Assessment as per World Bank Policy OP4.0, the PMU Safeguards team in collaboration will produce a Terms of Reference which will be reviewed and cleared by the WB's Task team prior to commencement of the study.

A Generic Terms of Reference which should be used as the minimum requisite level of information for undertaking all EAs is presented in Annex 7. In addition, Annex 8 presents a Guidance Note on Identifying Human Elephant Conflict Issues that can be used in project interventions, especially in the dry zone landscape.

Strategic Environment Assessment (SEA)

Development agencies have years of experience in using environmental impact assessment (EIA) to integrate environmental concerns into their funding programs. EIA procedures, methods and techniques, used to address environmental impacts of development projects, will continue to be applied. However, EIA has limited utility when applied to the more strategic levels of development assistance such as policies, plans and programs, as these are also influenced by political bargaining in addition to technical criteria. Further, significant indirect or secondary environmental effects can arise as a result of changes in people's behavior induced by policy reforms. But these changes, and their environmental consequences, are extremely difficult to predict. For these reasons, SEA has been developed and is being increasingly used as a tool to be applied at the level of policies, plans and programs.

A comparison between SEA and EIA

EIA	SEA
Applied to specific and relatively short-term (life-cycle) projects and their specifications	Applied to policies, plans and programs with a broad and long-term strategic perspective
Takes place at early stage of project planning once parameters are set	Ideally, takes place at an early stage in strategic planning
Considers limited range of project alternatives.	Considers a broad range of alternative scenarios

Usually prepared and/or funded by the project proponents	Conducted independently of any specific project proponent
Focus on obtaining project permission, and rarely with feedback to policy, plan or program consideration	Focus on decision on policy, plan and programs implications for future lower-level decisions
Well-defined, linear process with clear beginning and end (e.g. from feasibility to project approval)	Multi-stage, iterative process with feedback loops
Preparation of an EIA document with prescribed format and contents is usually mandatory. This document provides a baseline reference for monitoring	May not be formally documented
Emphasis on mitigating environmental and social impacts of a specific project, but with identification of some project opportunities, off-sets, etc	Emphasis on meeting balanced environmental, social and economic objectives in policies, plans and programs. Includes identifying macro-level development outcomes
Limited review of cumulative impacts, often limited to phases of a specific project. Does not cover regional scale developments or multiple projects	Inherently incorporates consideration of cumulative impacts

An SEA is not an alternative to EIA and it does not replace the need to do project specific environmental assessment. A good SEA can reduce the scope of EIAs within its geographical scope and make it limited to specific project level issues. The SEA ideally will identify opportunities to minimize the range of environmental issues that will have to be dealt at the project level.

At present SEA is not mandatory in Sri Lanka. However, all Ministries, Departments and Authorities who are responsible for implementing a new policy, plan or program should carry out a SEA for the new policy, plan or program prior to its implementation and submit a copy of the SEA report to the CEA for review and comments. To facilitate this process a document has been developed by the CEA titled “**A SIMPLE GUIDE TO STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)**” that can be downloaded from the CEA website. A generic term of reference for SEA is presented in Annex 9.

As for the current scope of the IWWRMP, the need for SEAs is unlikely.

Environmental and Social Management Plans (ESMPs)

Preparation of an EMP is the final stage of an environmental assessment process. When activities have explicit impacts (irrespective of the degree) on the natural environment then an action plan is required to be instituted mitigate impacts and monitor mitigation measures to be able to take corrective measures in a timely manner. ESMPs must be kept as simple as possible, clearly describing adverse impacts and mitigation actions that are easy to implement. The scale of the subproject will determine the length of the ESMP. A small-scale subproject's ESMP can be elaborated in a few paragraphs or in tabular format, keeping it as simple as possible with concrete mitigation actions, timelines and responsible persons.

The basic elements of an ESMP are;

- a. A description of all possible significant adverse impacts that are likely to arise due to the project that the ESMP is intending to deal with;
- b. A description of planned mitigation measures, and how and when they will be implemented;
- c. A program for monitoring with measurable indicators that will allow to determine the effectiveness of the mitigation actions
- d. A description of who will be responsible for implementing the ESMP
- e. A cost estimate and source of funds

(Refer Annex 3 for guidelines for developing ESMPs)

It is essential to involve local communities during the development of the ESMP since they are likely to be the most affected parties due to the proposed development. Further, local knowledge is important in identifying and designing mitigation measures, especially in the absence of long-term environmental and social data for locations concerned. In addition, the success of the implementation of the EMP will depend on community ownership, support and action.

As per the nature of the physical interventions identified, it will be mandatory that all proposals/ physical interventions implemented will require an ESMP to mitigate sub-project specific impacts identified during the screening exercise. In World Bank funded projects, a **standalone ESMP only** is considered appropriate in situations where a detailed environmental analysis is not required. The ESMPs are to be prepared at the stage of detail project design and included in bidding documents with relevant budgets. Activities outlines in the ESMPs will be implemented by the implementing agencies or the respective contractors implementing the subproject and monitored accordingly by the project implementing agency during the construction phase.

The following Annexes provide guidance on identifying potential impacts and mitigation measures as well as outline requisite standards to be maintained in terms of environmental management during the implementation of activities under the program.

- *Annex 8 The Guidance Note on Identifying Human Elephant Conflict Issues*
- *Annex 10: Guidance Note on Selecting Mitigation Measures to be Included in the Environmental Management Plan for Construction Projects in Sri Lanka*

- *Annex 11: Guidelines for the Rehabilitation of Burrow Pits*
- *Annex 12: Guidelines for Health and Safety of Workers, Communities and Visitors*
- *Annex 13: Guidelines for the relocation of living and non-living articles of conservation value*
- *Annex 14: Procedures for Physical Cultural Resource Impact Screening, Assessment & Management*

The **World Bank Group General EHS Guidelines** contain information on cross-cutting environmental, health, and safety issues potentially applicable to construction and can be downloaded via the following link.

https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/ehs-guidelines

The **World Bank Group ESH Guidelines for Construction Materials Extraction** (<https://www.ifc.org/wps/wcm/connect/d6bb0e80488551afa93cfb6a6515bb18/Final%2B-%2BConstruction%2BMaterials%2BExtraction.pdf?MOD=AJPERES&id=1323162191491>) is also applicable to the project and used as key guidance provided to contractors on the management of environmental health and safety during construction material extraction in addition to specific guidance provided in the ESMF. This document includes information relevant to construction materials extraction activities such as aggregates, limestone, slates, sand, gravel, clay, gypsum, feldspar, silica sands, and quartzite, as well as to the extraction of dimension stone. It addresses stand-alone projects and extraction activities supporting construction, civil works, and cement projects. Although the construction materials extraction guidelines emphasize major and complex extraction schemes, the concepts are also applicable to small operations and should be used for guidance. These guidelines can also be downloaded via the link provided above.

5.1.4 Physical Cultural Resources Safeguards Processing Steps

Implementation of the PCR Safeguards requirements will follow the steps presented below closely linking with activity planning, design and implementation steps.

1. The Environmental Screening Form, Generic EA and SEA Terms of Reference presented in Annex 1, 4 and 5 respectively, include adequate provisions for the identification of any potential impacts on PCRs. The project shall make every effort to avoid the removal and/or destruction of any property of cultural, archeological or heritage significance.
2. For any proposed project intervention to be conducted **either within or in close proximity to a known heritage asset**, either locally, nationally or internationally designated, should follow the procedure of due diligence outlined in section 4.2.5 **in addition to the Environmental and Social Screening Process**. Elaboration of required steps for the management of any chance for physical cultural resources or property or artifacts of cultural/archeological significance are presented in **Annex 15**.

3. In the event the site-specific EA clearly identified unavoidable impacts and recommends the relocation of any property of physical cultural resource (PCR) of archeological/cultural importance the provisions with regard to Physical Cultural Resources, presented in Annex X: Guidelines for the relocation of living and non-living articles of conservation value, should be implemented prior to commencement of any work on the site.
4. All works contracts regardless of locations will include in the EMP the measures outlined in section 4.2.5 on precautionary procedures for the management of chance found physical cultural resources.

5.1.5 Dam Safety Processing Steps

For any large dams (which are normally 15 meters or greater) and dams below that height but are considered to be complex from a design and management point of view either be rehabilitated or constructed under the program, as per OP/BP 4.37 requires that investigations, designs, construction and operation of the dam be reviewed by an independent panel of experts.

1. The borrower will appoint (or reconstitute as the case may be) an Independent Dam Safety Review Panel. The Panel will consist of three or more experts, appointed by GoSL and acceptable to The World Bank, with expertise in the various technical fields relevant to the safety aspects of the particular dams. The primary purpose of the panel is to review and advise the implementing agency of GOSL on matters relative to dam safety and other critical aspects of the dam, its appurtenant structures, the catchment areas, the area surrounding the reservoir and downstream areas. The Panel should also review and evaluate the implementing agency's operation and maintenance procedures and recommend improvements if necessary.
2. The ID, one of the concerned dam owner agencies is also the responsible implementing agencies of CRESMPA and it has (together with MASL) prior experience under the DSWRPPP on carrying out similar work thus should lead the process on brining the panel together. Once the panel membership is established, it should be sent for World Bank clearance and concurrence.
3. The Independent Dam Safety Panel should review detailed design and implementation plans, construction supervision plans, quality assurance plans, O&M plans and an emergency preparedness plan. The panel's inputs will be required for prequalification of bidders and during procurement as well as for periodic safety inspections after the completion of the civil works.
4. All additional plans such as instrumentation plans, operation and maintenance plans, emergency plans will be prepared as necessary for those dams for which such plans do not exist.

5.3 Concurrence and Clearance

5.3.1 National regulatory Clearances

As per the regulations, presented in Chapter 3 when working in specific project locations with environmentally sensitive issues there will be the need to seek specific environmental clearances from relevant authorities such as the FD, DWLC, CEA, NBRO etc.

5.3.2 Clearance Procedures with the World Bank

All safeguards instruments listed below will be subject to World Bank prior review and clearance by the World Bank safeguards specialist assigned to the IWWRMP. Only cleared safeguards instruments can be included in bidding documents and other procurement instruments. No work can commence on project sites without due clearance of the respective safeguards instrument.

- All Environmental and Social Screening Reports (ESSRs)
- All TORs for EAs
- All EAs, and ESMPs
- Panel membership names for any Dam Safety Panels established.

Upon project commencement the safeguards specialist will be required to prepare a table, tracking all requisite safeguards instruments for sub-projects as outlined in the generic template Environmental Safeguards Preparatory Tasks Tracking Sheet presented in Annex 15. This sheet should be continuously updated and managed by the project PMU and shared with the World Bank safeguards specialist every quarter or when requested.

5.4 Inclusion of Environmental Specifications and Environmental Management Plan in bid documents

It is important to ensure the environmental specifications and ESMP are included in the bid documents prior to commencement of the bidding process. It will be necessary to include specific costs for ESMP implementation or a provisional sum as part of the Bill of Quantities for those mitigations measure that are not part of the engineering costing. The environmental specifications should also include penalty clauses for non-compliance, specifically for complex and large contracts. The procurement staff of the relevant implementing agency and PMU together with environmental officer(s) will be responsible for this step.

Guidance on Incorporation of ESHS Requirements for Contracts as per the World Bank's Standard Bidding Documents

With the revision to the World Bank's Standard Bidding Documents in January 2017, Environmental and Social Health and Safety (ESHH) requirements are now more clearly defined in the document and there is

also the need for a ESHS Performance Security to be incorporated in to the requirements from potential bidders for implementation of works under project financing. This revision incorporates changes to enhance environmental, social, health and safety performance. A positive measure that is intended to enhance the commitment of a given contractor towards sound environmental and social management which clearly define what the expectation is from them as an implementing entity during project execution and reporting.

The following guidance will facilitate in the tailoring of these ESHS requirements during the use of the World Bank Groups Standard Bidding Documents for procurement activities. The Environmental Specialist and team of the PMU will be required to liaise with the Procurement Specialists of the project on ensuring the following guidance is incorporated accordingly.

- All standard language on ESHS and guidance is presented in the Standard Bidding Documents on what expectations are there from the contractor's side and what information should be provided from the client's side during procurement, implementation and reporting in terms of ESHS. The Environmental Specialist and team should conduct a thorough review of these requirements and ensure the following.
 - All sections are to be reviewed in detailed and cross reference will need to be made to the safeguards policies and instruments relevant to the specific subprojects which have been prepared as per the requirements of this ESMF.
 - Where required the PMU Environmental specialist may be required to update recommendations in the respective EA/ESMP to match the language in the Bid Document where major discrepancies have been noted to facilitate consistency in all documents.
 - In projects where safeguards documents for environment and social are prepared independently, it is recommended that the project Environmental and Social teams, based in the PMU, work together to ensure that social safeguard requirements are incorporated and Social Management Plans (SMPs) and ESMPs are merged and represented as ESMP.
 - This ESMF already includes guidance for ESMPs that incorporate the requisite measures for labor management, labor working conditions, worker health and safety, public health and safety and grievance redresses that are in line with the projects parallel social safeguards instruments.
- The ESHS Performance Security, is to be maintained between 1-3% of the total contract value as per the Guidance provided supplementing the World Bank's Standard Bidding Document, depending on the associated risks of the project. The total performance security for contracts will typically be 10% of the total contract value of which 3% should be allocated to the ESHS performance security, where a contract has a performance security of 20% the ESHS performance security is to be maintained at a maximum of 5% of the total contract value.

- While it is recommended that indicative costs should be presented with ESMP measures, if indicative costing have not been done on individual ESMP implementation items at the time of ESMP preparation, the following is to be undertaken. A **Lumpsum amount of 5% of the total contract value** should be maintained as the allocation for ESMP implementation. *(This amount has been typically adequate in managing with some contingency also so the same should be exercised in the BOQ guidance in the bid documents in projects in Sri Lanka.)*
 - The contractor is required to provide a costing at minimum within this amount in his BOQ, listing itemized values for EMP implementation.
 - The language should indicate that the contractor will be required to provide an itemized costing with the BOQ within this allocation.
- In addition, for large scale contracts that are assessed as high risk during environmental screening, it is also requested for the contractors to have the following certifications in the Eligibility and Qualifications Subsection, in Section III of the Standard Bidding Documents, under Contractor Requirements.
 - Registration with ISO 14001 (Environmental Management)
 - Registration with ISO 45001/ OSHAS 18000/ or equivalent on (Occupational Health and Safety Management)
 - If not already registered, must be willing to register as such prior to requesting mobilization amount or any other payment for the contract

5.5 Compliance Monitoring and Reporting

5.5.1 Ensuring Compliance with ESMPs

Supervision of ESMP implementation along with other aspects of the project, will cover monitoring, evaluation and reporting in order to achieve, among others, the following objectives:

- Determine whether the project is being carried out in conformity with environmental safeguards and legal agreements
- Identify issues as they arise during implementation and recommend means to resolve in time

The environmental and social specialists and the environmental and social safeguards team based in the PMU will be responsible for overall monitoring of the ESMPs up to the project closure and transfer for management to the designated authority.

The PMU Environment and social safeguards team will confirm the performance of the supervision consultants by regularly visiting the project site during the implementation stage and providing guidance on corrective measures on any lapses as required.

Compliance monitoring comprises of on-site inspection of the construction activities to verify that measures identified in the ESMP are included in the clauses for contractors are being implemented. This

type of monitoring is similar to the normal technical supervision tasks ensuring that the Contractor is achieving the required standards and quality of work. Photographic documentation of non-compliance as well as best practices will be used as a means of recording implementation conditions efficiently, in addition to written evidence. Where needed, as identified in the ESMP, testing of environmental parameters will be carried out to support compliance monitoring.

A standard Environmental and Social Compliance Monitoring Checklist for Project Activities is presented in Annex 15. In addition, the Special Monitoring Checklist for Ensuring Safe Conditions for Workers and Public, presented in Annex 16.

Regular World Bank missions will include specialists to monitor the project's compliance with World Bank safeguard policies. The progress of environmental monitoring will be formally communicated to World Bank through **(a) a bi-annual environmental monitoring report (submitted two weeks prior to each supervision mission) and (b) quarterly progress reports or as per the compliance monitoring agreement made during project implementation.**

5.5.2 Compliance with Dam Safety measures

The technical teams of MASL and ID will be leading the activity on dam safety planning. The Environmental Specialist will be expected to collaborate and co-ordinate with the technical teams to ensure basic due diligence is practiced. The bi-annual environmental monitoring report will contain a section on how the key policy provisions of OP 4.37.

5.5.2 Project Level Environment Audit

The effectiveness of safeguard policies in ensuring sustainable development finally depends on how well environmental impacts are identified and mitigated in the development process. In the proposed project, the degree to which environmental assessments and management plans are carried out and complied with will determine success/failure of the recommended due diligence process. Therefore, evaluating the environmental safeguards management system process (as recommended in this framework) during the project's planning and implementation phases is important. It will enable the project management to check environmental compliance of the project and, if needed, make necessary amends.

The purpose of the environmental audit is to;

- Check compliance of the project with ESMF requirements on due diligence
- To evaluate the effectiveness of the screening process and implementation of ESMPs
- To identify and report if there is non-compliance with the ESMPs
- To verify the monitoring parameters are in compliance with national set standards
- Collect, analyze and interpret monitoring results to detect changes related to implementation and operation of specific activities

- To compare predicted impacts with actual impacts and evaluate the accuracy of predictions.
- To document challenges in safeguard implementation and make practical recommendations to improve safeguards management.

The auditors should first develop a structured questionnaire based on the ESMPs for the purpose of conducting the audit. Then during the site visit data can be collected using this questionnaire through interview surveys of officers responsible for implementation of the ESMPs and site records, logs etc.,

Expected outcomes of the Environment and Social Audits are

- Ensure that ESMPs are implemented properly
- Ensure that the mitigation measures are effectively minimizing the identified impacts as well as identify new impacts that may have been excluded in the ESMPs that require mitigation. Then make necessary adaptive changes to the EMPs to ensure that the all significant impacts are effectively mitigated.
- Identify noncompliance with ESMPs if any and provide recommendations as to how to deal with such non-compliance to further strengthen the success of project activities.

An environmental and social audit for IWWRM will be conducted, twice during the project implementation period. Once in the second year of project implementation prior to the Mid Term Review and a year before the project's stipulated closing date. In addition, an audit can be initiated if a situation would call for one – for example high number of safeguards related grievances, poor implementation of ESMPs etc. The audit will require to cover all activities outlined in the ESMF. review a sample of (i) the screening forms prepared by each project implementing agency (ii) standalone environmental assessments/management plans (iii) application of the NEA and its clearance procedures followed by the project, as the case be, and based on site visits ensure conformity with conditions, guidelines and comments stipulated in these and other related documents. A draft Terms of Reference (TOR) for the Environmental Audit is presented in Annex 18, which should be reviewed and fine-tuned before issuance of the RFP.

5.6 Information Disclosure

Disclosure of relevant project information will help affected communities understand the risks, impacts and opportunities of the Project. The implementing agency will publicly disclose the ESMF and all Environmental and Social Assessments, including ESRs, SSRs, EAs, REAs, SIAs, LSAs and ESMPs, for public review and comments in appropriate locations in the Project area. These include the project websites, social media, project offices and local authority offices to ensure all layers of the community have due access. Executive summaries of all ESIs and RESAs are to be translated to the local languages of Sinhala and Tamil.

All documentation will also be made available on the implementing agencies web site both in English and in local languages. Newspaper and other media outlets will alert the community to the availability of the documentation, an example of a public announcement on EA disclosure is presented in Annex 19. The website will also enable the community opportunity to provide comment electronically.

All safeguards Documentation will also be made available in the World Bank's external website.

5.7 Grievance Redress Mechanism

The GRM for SLWRM has been detailed out in the RPF prepared for the project and is also summarized in Chapter 9 of the ESMF.

5.8 Consultation Plan

The IWWRMP has undertaken several consultations during project preparation on the overall planned interventions to be financed by the project. The first draft ESMF has been publicly disclosed since March 2019. During project implementation, safeguards Instrument wise consultations will need to be undertaken around each project site. During project implementation, the PMU and IAs will carry out continuous consultations with stakeholders and report back as part of safeguards monitoring.

In this line at project implementation a detailed safeguards consultation plan will be prepared and endorsed by the World Bank task team. The consultation plan should outline dates of consultations, locations and other information as relevant to the subprojects and the consultation notes will be documented and shared with the World Bank. Consultation programs should first provide information in the form of briefs and relevant documents to the group being consulted at minimum at least 2 weeks prior to the date of consultation. The feedback and concerns raised on environmental safeguards issues, during consultations are to be thoroughly evaluated and any issues and concerns, once verified and where practically possible in the context of the project, should be mitigated via the relevant environmental safeguards instrument.

Consultations are also inbuilt in the project planning, design and implementation approach. Prefeasibility and feasibility teams are expected to conduct and record consultations with the local stakeholders and project affected persons. During construction, the site supervision team are expected to consult regularly with the affected people/community as well as local stakeholders for their observations and feedback.

5.9 Sequence and Action Plan of Safeguards instruments for subprojects to be financed under the project.

5.9.1 Typical Timeframe for planning and carrying out safeguards assessment

Timely planning and execution of environmental screening and follow up assessments/plans for sub-project investments would be crucial in achieving overall project implementation and completion targets. Any delay in obtaining relevant environmental approvals/clearances would hold back commencement of sub-project activities thus causing project implementation to be delayed. Hence, it is extremely important that the PMU initiates sub-project specific screening and follow up assessments as soon as the concept designs become ready. All environmental assessments/plans should be completed by the time of tendering and the ESMPs should be a part of the bidding document so that the contractor is made duly aware of his commitments towards environmental safeguards management under each sub-project.

As a guide, the following table provides typical timelines for completing the safeguards cycle for different types of safeguard instruments. This timeline is intended to guide the PMU in planning screening and follow up assessment ahead and to determine a realistic timeframe to commence the tender process for the sub-project investments. Please note the table below does not include time taken for procurement of consultancy services to conduct the EAs.

The PMU will prepare and share a project specific timeline with the World Bank during project implementation.

Stages in the process	ESAs	ESMPs	Remarks
Environmental and social Screening	1 week	1 week	The need for follow on assessments will be determined by the screening outcome
Scoping and setting of EA/SA TOR when applicable	2 weeks	1 week	
Report preparation	4 months	1 Month	Length of time will be determined by the complexity of issues involved. What is considered here is an average based on the type of projects.
Report appraisal	2 weeks	1 week	
Public consultation	1 month	1 month	
Report Finalization	2weeks	1 week	
Clearance			
Other GoSL Clearances where applicable			
Tentative time for EA cycle that requires CEA clearance (min – max)	8 months	3–4 months	

Provision of preliminary project information	1 week	-	
Scoping & determine IEE/ESIA and TOR preparation	1 month	-	WB will review TOR and provide consent/comment
IEE/EIA report preparation	NS*	-	One report to satisfy both local and WB requirements
Checking adequacy of IEE/ESIA report	NS	-	WB will review and submit comments
Provision of additional information if required	NS*	-	
Public consultation	1 month	-	WB safeguard policies will require a period of 120 days public commenting period
Forwarding Comments to the PP	1 week	-	
Responding to public comments	NS*	-	
Decision	1 month	-	WB clearance will be provided concurrently
Concurrence on the decision			
Appeal against rejection (If rejected)			
Final Decision			
Tentative time for EA cycle	12–15 months approx.		

5.9.2 Safeguards Training

The Environmental and Social staff under IWWRMP will be trained by the Environmental Specialist and Social Specialist of the WB project team on ESMF implementation, safeguards and procedural requirements of the WB. Adequate awareness of WB's safeguard requirement is an important foundation to build in the very initial stages of project implementation.

Training will be provided for the PMU and all Implementing Agencies who will execute the project on how to monitor and report on environmental and social safeguards requirements by the E&S staff and E&S focal points. They will be also provided training on the use of Grievance Redressal mechanism and community/public consultations. The generic scope required for such trainings are presented in the Session Plan presented in Annex 20.

All contractors are expected to disseminate and create awareness within their workforce on ESMP compliance, and provide any staff training necessary for their effective implementation. Where contractors do not have existing environmental staff, project's safeguard staff will plan for adequate capacity building within the workforce to be involved.

Requisite Training Programs and Estimated Number During Course of Program for Each Phase.

Training Program	Target Audience	Conducted By	Minimum Number to be conducted over project period
ESMF and Safeguards Implementation Training: to cover world bank environmental safeguards, management, instrument preparation and monitoring during project implementation and reporting- (including refresher)- Training for Trainers Modality	PMU Staff	World Bank Environmental and Social Specialists and team	3 programs at minimum
ESMF and Safeguards Implementation Training: to cover world bank environmental safeguards, management, instrument preparation and monitoring during project implementation and reporting- (including refresher)	Field Agency Staff and Irrigation De	PMU Safeguards Team	10 programs (twice per annum)
Training on implementation of Environmental Management Plans in construction contracts- focused on contract management	Cluster of project contractors, implementing works under the project	World Bank Environmental Specialist, PMU team and external resource persons	3 programs at minimum per annum
Training on implementation of Environmental Management Plans- Based on subproject specific ESMPs needs	Contractor Staff of each subproject, including supervision consultants environmental officers (if any)	PMU safeguards team	At minimum twice, (prior to the contract commencing on the ground and mid-term) for each subproject in implementation
Certificate Best Practice training on Environmental Management within biology of water resources management. (continuation from DSWRPP)	Key technical staff of agencies involved in the sector, including ID, MA, SLRDCC, NBRO, DMC etc.	External Party accredited in conducting certificate course training	2 programs

Chapter 6 – Institutional Arrangements for Implementation of the Project

6.1 Overall Project Institutional Arrangements

The project will be managed by a PMU embedded in the executing Ministry, with part of the staff in the PMU drawn from government agencies. The approach to PMU draws from experience from the Dam Safety Project in which many key staff were drawn from implementing agencies themselves which strengthened client ownership and institutional capacity. The PMU will be responsible for ensuring that (a) all project activities are planned, financed, and implemented according to the annual work plan and budget; it shall no later than two months after furnishing each annual work plan and budget, finalize and adopt, and thereafter ensure that the project is carried out in accordance with, such plan and budget as agreed in writing with the World Bank; (b) project implementation is in accordance with the PIM, to be adopted by the client within three months of effectiveness of project; (c) project procurement and financial management (FM) activities are carried out on time according to the World Bank's Procurement Regulations, the project fiduciary manuals of the PIM, and the Procurement Plan (PP); and (d) social and environmental safeguards applicable to the project are fully complied with. The PMU is also responsible for monitoring project activities, preparing the quarterly and annual project progress reports, and ensuring that all reports (including financial reports) are submitted to the World Bank on time. The overall project oversight will be the responsibility of the National Project Steering Committee (NPSC), established in the MMAIRD and chaired by its secretary within three months after the project gets effective.

6.1.1 Component 1 Watershed Management:

It is generally recognized that historically, there has been no institutional anchor in Sri Lanka for WSM and that the various existing capacities are spread across a range of government institutions. The executing ministry with the help of a project support consultancy will carry out the evidence-based watershed modelling, simulations, and detailed geographic information system (GIS) analysis and, in turn, develop a cascade of WSM plans, ranging from a plan for the entire Upper Mahaweli Watershed down to the mini-watersheds. The plans will be presented and coordinated through the existing provincial, district, and divisional agricultural committees and at the village level through the WSM committees, comprising relevant government officials at the village level (that is, *Grama Niladari*, *Samurdhi Niladari*, Agricultural Research and Production Officer, and Economic Development Officer) and the representatives of farmer organizations. It is through the agricultural committees that the various local agencies will be consulted.

Under Component 1.3, activities related to bulk water allocation and installation of HMIS stations will be managed by the MASL and activities related to groundwater management will be implemented by the WRB.

Two comprehensive Operations Manuals, first on WSM and the second covering groundwater management, and an overall PIM have been prepared, which will guide the implementation of the project.

6.1.2 Component 2: Infrastructure Improvements

Component 2 will be implemented by the EPC, ID, MASL, and NPC. The ID and MASL have developed strong working partnerships with the World Bank and demonstrated their technical capacity for planning and implementation of water sector projects such as the DSWRPP and CRIP. These agencies are conversant with the World Bank's due diligence requirements in technical, fiduciary, and safeguard management. The NPC also has had a strong working partnership with the World Bank in planning and implementation of several sector-related projects over the last 20 years. The ID will assist the EPC for the preparation and implementation of schemes to be rehabilitated under the EPC.

6.2 Institutional Arrangement for Implementation of the ESMF

The PMU to be established within the MMAIRD will appoint suitably qualified and experienced experts to focus on the tasks and responsibilities outlined in the ESMF in the role of a (i) Senior Environmental Specialist (SES) and Senior Social Specialist (SSS).

6.2.1 The SES and SSS of the PMU

Both the SES and the SSS will report to the Project Director (PMU), under the Secretary (MMAIRD), and will be responsible for the overall management of environmental and social safeguards, respectively, of the project and the implementation of the project specific safeguards instruments. The recruited Specialists will partake in the following responsibilities;

- Provide overall policy and technical direction for safeguards management under the Project, as defined (but not limited) by this ESMF.
- Co-ordinate closely with the Environmental and Social Officers in the team (see below) and the implementing agencies involved (as per the project's implementation arrangements) in planning and managing project implementation as per the safeguard requirements outlined in this ESMF; and provide necessary technical assistance to facilitate the implementation, management and monitoring of environmental and social safeguards.
- Agree on work programs with the Environmental and Social Officers of the team.
- Ensure environmental and social due diligence is carried out for each sub-project as soon as conceptual technical design and scope have been defined, as outlined in this framework.
- Closely co-ordinate with the PMU procurement and technical teams and MASL, ID, FD etc technical colleagues for timely preparation of Environmental/Social Assessments/Management Plans for sub-projects, as necessary (depending on screening outcome); co-ordinate for hiring technical assistance, where necessary, and for review and endorsement of these safeguard documents

- Conduct environmental and social screening for subprojects in collaboration with the team. Mobilize specialized expertise such as for biodiversity surveys if a particular site requires so in order to arrive at accurate screening decisions.
- Ensure consistency of safeguard documents with national regulations and world bank policy requirements as defined in this ESMF; work with the PMU to obtain necessary clearances from local environmental/archaeological regulatory authorities for sub-projects, where applicable.
- Prepare terms of references to undertake requisite safeguards assessments for complex activities that will warrant EA/SA as per the environmental and social screening conducted and obtain necessary clearances from the World Bank and/or designated project approving agencies.
- Manage the consultants hired to undertake the preparation of environmental and social safeguards instruments, including environmental and social assessments and other safeguards assessments, where applicable, and provide coordination support with implementation agencies and individuals
- Review draft and final environmental and social safeguard instruments for quality and obtain necessary clearances as per the safeguard instruments.
- Ensure that applicable measures in the ESMPs are included in the design, and conditions on compliance with ESMPs are included in the bidding documents.
- Liaise closely with the procurement team of the PMU on the above.
- Develop, organize and deliver environmental and social training programs and workshops for the Implementing Agencies at the field level, contractors, field supervision staff and other implementing agency officials as needed, on safeguard requirements and their management
- Ensure compliance with ESMPs during the construction period and maintain close co-ordination with the technical teams of the IDs, and/or supervision consultants who will conduct monitoring of the implementation.
- Prepare additional technical guidelines, if necessary, to support the safeguards instruments in order to strengthen the implementation of environmental and social safeguards.
- Ensure adequate public consultation during the preparation of safeguards instruments
- Ensure public complaints relating to nuisance and inconvenience caused by sub-project implementation are addressed with corrective action and adequately documented
- Report to the Project Director, Secretary of MMAIRD and the World Bank on the overall environmental and social performance and compliance of the project as part of PMU's periodic progress reporting.
- Maintain close cooperation with FD, MASL, ID, NPC, EPC etc to monitor the O&M during the operation of the project;
- Hold regular review meetings with the safeguards officers of the ID and visit selected project sites to monitor implementation of the safeguards instruments.
- Prepare routine monitoring reports, in collaboration with the IAs as set forth in the safeguard instruments.
- Liaise closely, where technical guidance is required, with the Environmental and Social Specialists of the World Bank task team.

- Promote community participation in the process of planning, management and monitoring of environmental/social impacts of sub-projects; provide guidelines on community participation in environmental/social monitoring to the ID.
- Prepare terms of references for the systemic environmental and social audits for all project components and obtain clearances.
- Review and comment on audit reports, take necessary actions to address audit issues raised and obtain comments from World Bank.

The SES will need to have the following academic qualifications and experience.

- At minimum, a Master's Degree in a field related to Environmental Management, Environmental Engineering or a related field
- A Minimum of 8-10 years' professional national experience in environmental management, including extensive field experience, working with various government and private sector agencies and community organizations, especially in the field level.

The SSS will need to have the following academic qualifications and experience.

- At minimum, a Master's Degree in a field related to Social Development, Sociology or a related field
- A Minimum of 8 years' professional national experience in social and livelihood support management, including extensive field experience.

The SES and SSS will have Environmental Officers (EO) and Social Officers (SO) assigned to assist in coordination and requisite field reviews etc, as necessary. The PMU will be required to hire these individuals who will perform the role explained below, each officer will conduct the following tasks.

6.2.2 Environmental and Social Officers at PMU

The EO's and SO's key role and responsibility is to support the SES and SSS and will report directly to the SES and SSS, respectively. Initially 2 Environmental and Social Officers (ESOs) will be hired to support the safeguards in the project program.

- Work with the SES and SSS in conducting environmental & social screening and prepare the environmental & social screening reports (ESSR) assigned and take part in other tasks assigned during ESMF implementation.
- Conduct necessary field work/ data collection for completion of environmental screening reports during sub project preparation and monitoring reports during sub project implementation.
- Coordinate with the project partner agencies to ensure timely delivery of safeguards instruments and monitoring updates.
- Visit all project sites during implementation, monitor ESMP implementation and prepare a monthly monitoring updates to be shared with the SES and SSS.

- Follow up with implementing field staff, contractors and supervision consultants on handling complaints and grievances on project implementation.
- Conduct training on environmental and social safeguards requirements for contractors and contractor staff.
- Conduct training to ensure safeguards are built into watershed planning committees and that awareness at the community level is enhanced for sustainability of project interventions.
- Other tasks as directed by the SES or as the need be.

EOs will need to have the following academic qualifications and experience.

- At minimum, a Master's Degree in a field related to, Environmental Management, Natural Resource Management or a related field.
- A Minimum of 2 years' professional national experience in environmental management, including extensive field experience, working with various government and private sector agencies and community organizations, especially in the field level.

The SOs will need to have the following academic qualifications and experience.

- At minimum, a Master's Degree in a field related to social sciences or a related field.
- A Minimum of 2 years' professional national experience in social management, including extensive field experience, working with various government and private sector agencies and community organizations, especially in the field level.

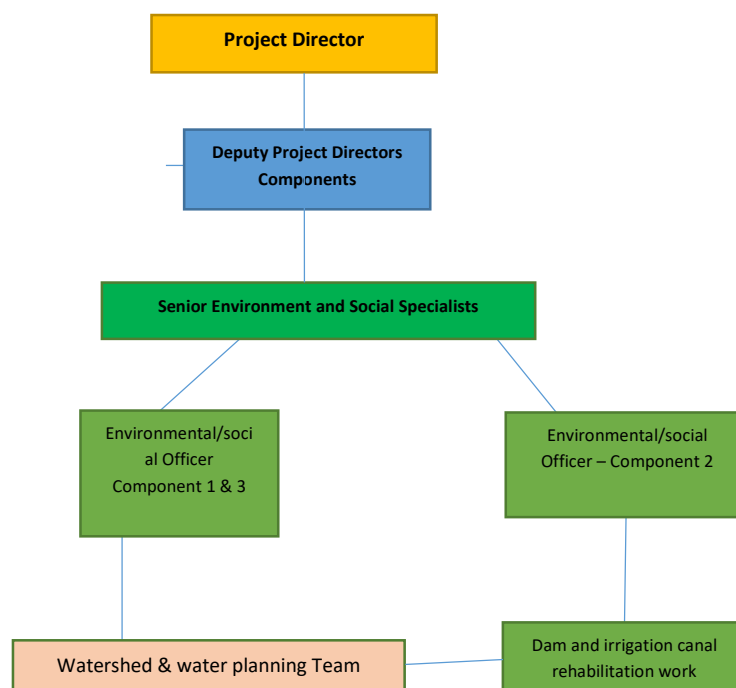


Figure 9. Organogram of Environmental and Social Safeguards Team in PMU

6.2.3 Contractors

Implementation of measures laid out in the ESMPs from the preconstruction, during, and to the close of construction will largely be the contractor's responsibility (apart from those provisions relating to technical designs and other specified tasks indicated in the ESMPs) and for this the contractor will nominate a safeguard officer (as requested in the ESMP) as the focal person who will be directly responsible for ensuring compliance with the ESMP during construction. The requisite qualifications for the environmental officer to be appointed by the contractor are presented in the Term of Reference in Annex 21.

6.2.4 Consultants

The PMU will hire environmental and social consultants to provide technical support the PMU where specialized services are required. Some of the consultancies identified include:

- Preparation of EAs/SAs, ESMPs, SEAs and other requisite safeguard assessments for sub projects as outlined in the ESMF and determined via the Environmental and Social Screening.
- Conducting two systemic Project Level Environment Audits outlined in the ESMF

6.3 The Roles and Responsibilities of World Bank

The World Bank project task team, specifically the environmental and social specialists, will provide close supervision and necessary implementation support by reviewing and providing guidance on conducting screening, and the preparation of relevant safeguard instruments as well as providing training for trainer's programs for the SESSC and team and other programs identified in the ESMF;

- Undertake prior review and provide feedback on all safeguards instruments, review of monitoring updates and other relevant safeguards documents.
- Ensure regular missions to review overall safeguards performance and provide further implementation support
- Share knowledge on technologies and best practices
- Provide guidance on handling complaints and grievances from a technical standpoint.
- Provide training support on Bank's safeguard policies and requirements of the project.

The World Bank will emphasize opportunities for social development and environmental sustainability provided by the Project, as well as adequate attention to gender equity particularly during community involvement. Within this framework, the World Bank will help monitor the implementation of activities and of safeguard instruments. The World Bank Social and Environmental Specialists will be available to provide timely guidance to the PMUs and will participate in field visits on a regular basis.

The World Bank will monitor compliance with the standards of safeguard instruments during implementation support missions, and technical guidance will be provided accordingly. A staff based in the Country office will also be assigned to provide day-to-day supervision of all operational aspects, as well as coordination with the client and among World Bank team members. Task team leadership, as well as safeguards, procurement, FM, and technical aspects, will be managed from the World Bank's offices in Colombo with support from Washington DC and other country offices. Consultants will be hired to provide advisory services in specialized issues.

Chapter 7 – Gender and Development

7.1 Need for gender inclusion

The objective of gender inclusion in the ESMF strategy is to ensure gender equity in the IWWRMP enabling poorer, vulnerable households to increase their labor force participation of especially women and youth. These recommendations and guidance's will promote gender sensitivity in the IWWRMP subprojects and identifies possible partners for gender-related activities. This approach is adopted understanding that gender equality refers to the equal rights, responsibilities and opportunities of women and men, transgender, intersex people, girls and boys.³⁷

Water is crucial to development in any sector. With increasing stresses of population growth, and ever-increasing demand for food, energy, and construction in light of looming threats of climate change are putting a major stress on the country's water resources. It is therefore, extremely important than ever to break the silos and adopt an integrated, all-of-society approach that ensures that the needs of women and marginalized groups are addressed in the implementation of water policies and interventions. Achieving water security means adopting inclusive and participatory approaches³⁸.

Overall outcomes expected from gender inclusion into the project will result in following benefits:

- Identify gender-based differences in access to resources to predict how different members of households, groups, and societies will participate in and be affected by planned development interventions;
- Permit planners to achieve the goals of effectiveness, efficiency, equity, and empowerment through designing gender specific activities and supportive program strategies;
- Sensitize the project personnel on GBV; incorporate measures to prevent and address incidents of GBV including establishment of a separate GRM to handle GBV related complaints.
- Develop training packages to sensitize development staff on gender issues and training strategies for beneficiaries.

Identifying gender gaps in unemployment, wages, and employment type in the project area of influence and adoption of corrective action within subproject will lead to increased benefits and reduced impacts in subproject areas.

7.2 Demographic trends of the areas

³⁷ CBM: Inclusion. <http://www.cbm.org/Inclusion-246762.php>

³⁸ GWP. 2017. Action Piece on Gender Equity and Water Resource Management.

Out of the total population of 20.3 million (as per the Census of Population and Housing conducted in 2012) 51.6 % consisted women. This statistic of more women than men is reflected in the project areas as well. These women play a prominent role in the economic, political, environmental and socio-cultural sustainability though household heads in Sri Lanka still remain male dominated (75.8%).

7.3 Basic socio-economic statistics

High literacy rates are maintained in the country for both men and women within urban and rural populations (above 92%). However, women in the estate sector show a relatively lower literacy of 80% coinciding with the Nuwara Eliya and Badulla districts (87.2 and 89.2 respectively) which harbors most of the tea estates in the country and Badulla.

Women's participation in labor force is low, while poverty rate is high in the northern provincial districts. On the other hand, in Kurunegala, Matale, and Nuwara Eliya districts, women's participation is high, while poverty rate is low.³⁹ Rural women continue to have the highest unemployment rates compared to men though these rates have declined from nearly 11 in 2006 to 6.6% in 2013 with a further 4.6% being underemployed. However, the gender gap in youth unemployment rates is expanding⁴⁰ with an average of 75% being economically inactive; young women between the age of 25 to 39 still have higher unemployment rate (more than 90% - economically inactive) than other age categories in Sri Lanka. In Northern Province which was affected by the civil war, young women who have no choice but to seek work even though job opportunities are scarce compared with most other parts of the country. Unemployment rates are highest among youth in the country applicable to both men and women between ages 15 and 25 (as high as 25% for females and 16% for men).⁴¹

7.4 Common gender issues or gaps in the project areas

There are two potential gender gaps that the project can meaningfully address. One is enhancing economic opportunities for women through livelihood activities. The national statistics show that the country has outstanding success for narrowing gender gaps in human development (education and health) compared with other neighboring countries, but it still falls short in economic opportunities; female labor force participation rates have stagnated at around 33 percent, compared with more than 70 percent for males. Under Component 1 and 2, the project will provide technical support and financial assistance on livelihood activities for local communities, so that they gain training and equipment to start different businesses. The project will support marketing of their products, which is one of the weak points in past projects.

³⁹ World Bank .2017. Overview of Getting to Work: Unlocking Women's Potential in Sri Lanka's Labor Force doi: 10.1596/978-1-4648-1067-1

⁴⁰ ibid

⁴¹ Sri Lanka Labour Force Survey - 2013 Department of Census and Statistics

The second gender gap is to support female workers in tea plantations. Estate workers, who are mostly women, have been excluded from the society; they suffered from poverty, lack of access to adequate water supply, sanitation, education and health services. Alcoholism, sexual abuses and harassments are common in the estates. The project intends to work with state-owned tea plantations to help them improve soil conservations and reforestation. Improvements for social conditions of estate workers based on their needs will be one of conditions in an agreement between the government and estate managers.

Other potential gaps that require further study based on the subproject locations include public participation by women may appear as a gap as the registered stakeholders are predominantly male. Detailed analysis for each subproject will be carried out once the project specific locations are identified. However, women play a key role in leadership in these meetings as they are the more active partners who step in when the men are engaged in other activities. Women are also present in key positions in the farmer organizations. Women also play a supportive role in running the household.

Labor force participation and economic empowerment can be a gap in some parts of the country especially where there is poor infrastructure to support this. Some studies have shown that women contributed as much as men to agricultural activities and but labor inputs are not estimated. Nowadays, women who contribute to the household in financial terms are increasingly respected⁴².

The main reasons for the gender disparity in the labor force participation in the country have been attributed to inadequate provisions for flexible working hours and a lack of proper child care facilities. The gender gap in this area is also a consequence of the greater responsibilities women have in terms of household tasks and mobility constraints associated with inadequacies in public transport.⁴³ This will be dependent on the subproject areas and will have to be determined through subproject level analysis.

On the other hand, experience from the Dam Safety and Water Resources Planning Project showed that when consultation meetings were organized through farmers and fishery associations, most of the participants were men because of the nature of their memberships. In these cases, women-only meetings were requested separately to ensure their participations. Learning from the experience, the PMU will empower the local communities to mobilize them for livelihood activities and participatory monitoring of

⁴² Rajapakse, Darshini Anna. 1989. Agricultural transformation and changing labor relations: Implications for peasant women in Sri Lanka. In *The Hidden Face of Development: Women, Work and Equality in Sri Lanka*. Colombo. Sri Lanka: Centre for Women's Research (CENWOR). pp.41-62

D. J Merrey; S.Langan. 2014. [Review paper on 'garden kits' in Africa : lessons learned and the potential of improved water management](#). International Water Management Institute (IWMI)

⁴³ Central Bank of Sri Lanka, 2016

project activities, beyond setting up a grievance redress mechanism for the project level. Quarterly meetings with community members will be conducted to reflect feedbacks from local communities.

Another area of concern that would require attention under the current project is the living conditions and opportunities of the estate sector. According to SCD of Sri Lanka (2015), estate workers (mostly women) have suffered from poverty, lack of access to adequate education and health services.

Gender-based violence could be a concern, as the project will bring some labor influx to rural areas during project implementation period. Although a GBV risk is rated “low risk” for the project, the screening suggests the needs for providing GBV training and consultations for both local communities receiving labor influx and contractors. Contractors will have codes of conducts to be incorporated in contracts to be signed. Local service providers, such as midwives, “relief sister,” health clinics and NGOs, in project areas will be identified and mapped. In the estate sector, good practices of sexual exploitation and abuses guidelines will be shared prior to the construction. Moreover, the screening also identifies that the PMU and PIUs need to be trained to monitor GBV risks across the full span of the construction period. Finally, a specific project-based GRM will need to be established to address GBV related incidents by connecting complainants with available service providers and following up on complaints and maintaining the relevant records.

7.5 Consultations

Discussions on citizen engagement, community participation and gender issues related to the proposed project activities gave consensus that community participation and citizen engagement is the core of this project. The project stakeholders are not limited to governmental officers and residents in the watershed, but also community organizations, women’s groups, farmers/ fishery associations, watershed management committees, and tea plantation companies, and there have been many community mobilizations taken place through the government initiatives. Engaging them through existing channels and schemes is a key to successful consultations. The Operations Manual of Component 1 will lay out a framework and process of how the consultation should take place.

While majority of consultation meetings with local communities will take place once the project areas are identified through land use and mapping exercise, some initial consultations during project preparation were carried out where the following questions were posed:

- Who are the members the FOs? Can women get membership?
- What are the main activities of women?
- Do women have any specific issues?
- Are there any women’s groups that would benefit from this project?

From the consultations that were held, not so much gender imbalance was observed. Though women’s participation was low during the meetings, there were active office bearing female committee members

present. It was also mention by the farmers that very often women are the ones that participate in the meetings when they have other commitments. Women support the farming activities and also carry out independent income generation activities through womens organizations linked with the Agrarian Services. In the tea small holder areas, it was identified that that livelihood enhancement of women would be beneficial where they would be able to work within the village they live in. No other major concerns were brought up by women.

Since these consultations cannot be conclusive of all gender issues in the project area, it is necessary to have a planned series of consultations to identify the issues and gaps from which a gender action plan will be developed along with expertise from gender specialist.

Chapter 8 – Consultations

8.1 Overview

Sub project environmental and social analysis conducted under the IWWRMP (including screening), communities in the project sites should be structured in a manner that is culturally acceptable. All environmental and social assessment documentation and ESMPs should be made available to the public (in compliance with the World Bank's policy on Access to Information) by the PMU prior to awarding of works contracts through the website of the project and notified through media. In addition, it may be necessary to conduct discussions with the regulatory agencies (such as the MAHASL, ID, UDA, CEA, DA FD, DWCL, provincial council on relevant issues) and other implementing agencies who would be stakeholder of the project. Consultation will enable the project implementing agency to understand the stakeholder's requirements and for the stakeholders to develop an understanding of the project so that potential conflicts could be eliminated or minimized at the initial stage of the project cycle.

The process of consultation should be documented and followed up so that there is collective agreement on actions to be implemented. Public disclosure of the relevant safeguards documentation including the ESMF, RPF, ESMPs and EAs (such as EIAs) will be a pre-requisite for tendering civil works contracts. The contract documents for each contract package will strictly include the relevant environmental mitigation provisions stipulated in the ESMPs (which would have community concerns reflected, if any) for the given sub-projects. This would ensure that the contractor is compliant with safeguards requirements of the project.

Outlined below is a brief framework for planning the consultation under IWWRMP. Only the most appropriate consultation method will be adapted to sub-projects during implementation and the responsibility of consultation lie primarily with the MAHSL and its implementing partners.

8.2 Objectives of stakeholder consultations

The prime objectives of stakeholder consultation are listed below:

8.2.1 Environment

- Inform and raise awareness amongst stakeholders about the proposed interventions and to determine if there are any long term or short term environmental impacts that would affect their environment or the area influence. To include communities and relevant authorities, NGOs, private sector.
- To determine any environmental constraints at the ground level this may affect the implementation of the project.

- Identification of any existing environmental concerns at the sub project level and

8.2.2 Social

- Provide the stakeholders an opportunity to inform and influence the decision making process.
- Partner with the stakeholders so as to make the project widely accepted and to lower the potential negative impacts and increase the benefits.
- To ensure that the consultations are inclusive of all stakeholder groups/users of the area.
- Identify any conflict areas between user groups / areas that need solutions to move forward.
- To identify any livelihood impacts as a result of the sub project including any direct or indirect implications for women and children within the communities.
- Raise awareness on the presence of a grievance redress mechanism
- Identification of any resettlement or displacement concerns

Social aspects under IWWRMP, have been tackled in detail in the parallel RPF for the project.

8.3 The Elements of Effective Stakeholder Consultations

Stakeholder engagement will be carried out by MASL and its partners r implementing partners such as ID, NPC, FD and CEA from the onset of the project involving project-affected persons and communities under IWWRMP. The three main steps to be adopted for stakeholder engagement are:

- Identification of stakeholders. For each subproject, the affected persons will be identified (persons to be resettled, host community, relevant authorities).
- Identification of methodology for effective stakeholder engagement. MASL will come up with a stakeholder engagement plan. This plan will be carried out throughout the subproject implementation period with periodic consultation that addresses the following.
 - Responsibility and sponsorship – identification of agencies which will be responsible with allocated funds at each stage of the sub project.
 - Involvement of the correct stakeholders at each stage of the sub project - these should be identified early and is applicable to the affected parties and also to the authorities.
 - Identification of stages in subproject implementation to review and re-evaluate impacts being open to changes if required.
 - Ensuring open communication channels during the consultation process so that all can be heard.
 - Getting people ready for the changes being brought about by the subproject by identifying training or any other requirement to ensure smooth transition.
 - Ensuring that all stakeholders become responsible parties to the subproject and become accountable for the success of the project.
- Implementation of the stakeholder engagement plan in a timely manner.

Stakeholders will be informed about the subproject and the activities that will take. An awareness component will be carried out on the overall IWWRMP during the initial engagements. This may be carried

out as part of the stakeholder consultation process. Their views, comments and any concerns will be entertained and addressed. MASL links with other relevant authorities/entities will also be established through this process. The proceedings and outcome of such stakeholder engagements will be recorded and they will be considered in preparation of the EAs, ESMPs and RAPs.

Meaningful consultations will form an important part of the stakeholder engagement process. MASL and implementing partners will draft EAs and ESMPs with project-affected persons and communities in event that they are identified as “prescribed projects” under the national legislations. These documents will be disclosed on the web in all three national languages. MASL will engage subproject affected people in subproject planning, implementation, and monitoring. All subprojects will maintain a grievance and redress mechanism to uptake any complaints and issues during their implementation. Meaningful consultation will:

- be started early in the preparation stage of the subproject and is carried out on an ongoing basis throughout lifecycle;
- ensure that all parties have a voice in consultation, including national and subnational government, the private sector, nongovernmental organizations and affected people;
- provide additional support as needed to ensure participation of women, elderly, young, disabled, minorities, and other vulnerable groups;
- provide timely disclosure of relevant and adequate information that is understandable and readily accessible to the people affected;
- will be transparent and be undertaken in an atmosphere free of intimidation or coercion.
- Make the consultation process very simple and not too technical so that comments can be obtained from non-technical stakeholders as well.

8.4 Suggested Methods

Participatory workshops, focus group meetings and face to face meetings and informal individual interviews are the three most commonly adopted methods of stakeholder consultations and a mix of these can be employed under IWWRMP, as determined by the requirement.

8.4.1 Participatory workshops

Workshops which are participatory are important to engage large number of stakeholders with diverse interests and specialties. Effective participatory consultation workshops should contain the following basic features;

- (i) Orient the workshop towards a clear destination. In this connection it is necessary for the evaluator to present a very good project brief and the purpose of the consultation.
- (ii) The evaluator should be able to build bridges and consensus among stakeholders.

- (iii) Divide the participants into sub groups to represent adequate mixture of different interest groups and allow the sub groups to brainstorm among the group members and submit their views and comments from the sub group.

The above method is recommended for sub-projects under the ESMF and facilitate the involvement of , engineers, landscape architects, water resource managers, watershed management specialist and environmental planners), infrastructure provision institutions, NGOs and business community.

8.4.2 Focus groups discussions

Such meetings are conducted on the focus group, when the stakeholders have similar interest and objectives are focused towards one common objective. These consultation meetings are recommended for projects that involve relocation of families or protection of natural resources etc. These discussions will be useful under components 1 and 2 to identify any social concerns including livelihood issues of the farmer societies, fishing communities, etc associated with the tank and canal rehabilitation work and watershed improvement activities in the Upper Mahaweli region. Also to be used for gender based discussions mainly under component 1.

8.4.3 Stakeholder group meetings

Extremely useful in creating the right kind of understanding about the project among those it will likely affect or interest, and to learn how these external parties view the project and its attendant risks, impacts, opportunities and mitigation measures. During IWWRMP preparation, listening to stakeholder concerns and feedback can be a valuable source of information that can help improve project design and outcomes and help the project control external risks associated with the environment as well as to the affected persons.

8.4.4 Individual - face to face interviews

When the stakeholders are not large in number and represent in specialized areas of interest face to face interviews which are informal are very effective. This system is very flexible, permits in depth discussions to understand the issues and is low cost. However individual stakeholder consultations should be well planned as if not it may lead to "heavy focus on individual issues and interest". This method is recommended for the kind of consultation envisaged as part of sub-project screening as the sub-projects under IWWRMP as they are relatively small in size, potential impacts are very specific, and stakeholders are small in numbers. This method will be useful in establishing best practices in dealing with environmental and social concerns that are very specific to identified interventions where similar interventions have been carried out under other projects.

The stakeholder consultation process should be continuous. However since practical difficulties exist for continued consultation, at least consultation needs to be carried out at three stages; project preparatory

/ design stage, project implementation stage and project end stage so as to make sure that stakeholder concerns, interest, comments are adequately considered in the project management process.

8.5 Stakeholder analysis

The ESMF provides a preliminary stakeholder analysis based on a few consultations. A detailed stakeholder analysis will have to be carried out once subprojects have been identified under Component 1. The stakeholder analysis will further have to identify the following categories of stakeholders under each component.

- Key players – Stakeholders with a high level of interest and influence that should be involved in water management planning.
- Context setters – Highly influential stakeholders, but with little interest. These stakeholders may represent a significant risk and should therefore be monitored and managed.
- Subjects – Stakeholders with a high level of interest but little influence who, although supportive by definition, lack any capacity for impact, although they may become influential by forming alliances with other stakeholders.
- The crowd – Stakeholders with little interest in or influence on the water management planning process. There is little need to consider these stakeholders in much detail or to engage with them.

Besides those major categories, there may be other stakeholders that do not fit into any of the above.

The table below provides a preliminary stakeholder analysis under each component. This is only a guideline which will be strengthened and built on through national and ground level consultations at the inception of project implementation.

Stakeholder	Interest	Remarks
Watershed Management		
Government Institutions. In addition to the main implementing partners, others are still evolving and will be identified with the interventions at subproject level.	Involved as it is within their mandates to implement the interventions and to bring in any policy reforms if necessary.	For the different interventions the relevant institutions should be involved.
Academia	Involved in the designing and identification of the problem areas through studies and streamlining the interventions to the issues identified.	Will mainly involve at the inception in identifying the interventions through studies.
NGOs and other non-profit organizations	Often involved at the ground level at a smaller scale. Can draw on their experiences and knowledge to strengthen the component interventions.	After and initial consultation, the constructive groups should be identified to engage through the sub project.

	Especially good for environmental and social impact identification.	
Social development and women's empowerment institutions/organizations	Their involvement can help strengthen the social development component and identify any areas that need to be tackled along the lines of gender and empowerment of the affected communities.	After the initial consultation, the constructive groups will be identified for subproject cycle inputs.
Private sector	It is in the ineptest of marketing strategies and building the marketing links and PPPs to ensure maximum output as a result of the intervention.	They should be engaged from the inception of the subproject.
Farmers and other hoist communities	This is a high interest group as often their livelihoods will be impacted on (expected to be positive). It is important to take their site specific knowledge and their suggestions to ensure optimal benefit of the subproject.	All affected parties will be included.
Rehabilitation of dams and irrigation infrastructure		
Government Institutions. Mainly MASL, ID, NPC with interaction with Ministry dealing with fisheries and agriculture.	Involved as it is within their mandates to implement the interventions. Also this is where linkages can be brought in between the multiple users of the tank and canal systems to be rehabilitated.	Will draw mainly on the recently concluded dam safety project as it involves similar activities.
Social development and women's empowerment institutions/organizations	Should bring in a few groups to look at the social development side and women's issues as a reiteration that there are no major concerns.	Can draw from constructive participants from the national workshop on safeguards.
Farmers, fishermen and other hoist communities	This is a high interest group as often their livelihoods will be directly affected during the interventions.	It is essential that they are supportive of the intervention.
Strengthening Water Resources Management Institutions		
Government Institutions. Mainly MASL, ID, WRB.	Has the mandate overall water resources planning.	
Academia	Will support the preparation of the water plans and carry out	

	any necessary research, if necessary.	
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8.6 Stakeholder consultation and participation

During the preparation of the ESMF, several formal and informal consultations were carried out at both the national level and at the subproject level. The Table below provides a summary of the consultations carried out. Detailed accounts of the consultations are provided in Annex 21.

Consultation	Nature of consultation	Key stakeholder /participants	Key findings
1. Sri Lanka Watershed and Water Resources Management Project (P166865) Component 1; Watershed Management 07 th January 2019, at National Agricultural Information and Communication Center	National level Stakeholder consultation with government agencies and Academia.	MMDE, MASL, IWWRMP, CEA,LUPD, NWSDB, IWMI, Open Uni., Peradeniya Uni.,Survey Dept, LRC, FD, Ministry of Plantation Industry, Dept of Agric.,Central Province Health Dept., Dept of export agric.,DS Kandy and CEB.	Road map for Component 1 needs to be consolidated with supportive information and field visits Suitable institutional mechanism for coordination need to be developed. Environment: <ul style="list-style-type: none"> Identify watershed issues from analytical data inputs from stakeholders and past experiences. Need to identify physical dimension and characteristics of selected watershed. The identified interventions should be climate resilient. Most of the project area shows lands with lesser vegetation cover, moderate to steep slopes and moderate to high erosion hazard zones. In addition the following environmental issues were flagged at the consultation: <ul style="list-style-type: none"> No alternative water sources. Degradation and pollution of water quality. Issues and lack of capacity of water purification process. Illegal land clearing and encroachment.

			<ul style="list-style-type: none"> • Excessive soils, sand and mineral extraction. • Bush Fires (human induced) • Cultivation of Erosive Crops • Poor land management practices • Lowering forest cover and clearing for laying electric lines. • Imbalance in water use and extraction • Soil pollution and erosion • Spread of IAS (Invasive Alien Species) • Eucalyptus cultivation / unproductive tea above 5000 ft • Land ownership related issues • Garbage management and sanitation. <p><u>Interventions were proposed for the above issues and are provided in Annex 21-1).</u></p> <p>Social:</p> <ul style="list-style-type: none"> • Lack of sanitation facility was identified as an issue by the Health Department. • No other burning social issues were identified during this consultation, there affected parties consultation should be carried out once the sub project areas are identified. <p>Other:</p> <ul style="list-style-type: none"> • Lack of capacity in terms of investigation technologies was identified. • Lack of capacity in terms of staff to implement the interventions was also identified. • Lack of funds (in a timely manner) was also identified as a bottleneck. Watersheds located under the LRC lands in project area should be identified.
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			<ul style="list-style-type: none"> Survey Department offered assistance with any survey work under the project. For further information refer Annex 21-1.
2. Training and Demonstration Centre for Conservation Farming in Doragala, Nuwara Eliya district. 11 th January, 2019	Field level consultation providing insight to soil conservation practices implemented under an FAO project.	MASL, MMAIRD, FAO, LLUPD, WB Consultants	<ul style="list-style-type: none"> Training center is run by MASL with support from FAO. They provide in situ best practices for soil conservation (SALT) and organic farming. Farmers are provided with training in good agricultural practices (GAP) and are provided with financial support packages to encourage adoption of these practices in their own farms.
3. Meeting at Divisional Secretariat Office in Doluwa, Kandy district 11 th January, 2019	On-going progress review of FAO's demonstrational project	Farmers involved in conservation farming including a few organic farmers, MASL, MMAIRD, FAO, LLUPD, WB Consultants	<u>Environmental issues:</u> <ul style="list-style-type: none"> Bore holes being dug indiscriminately for the extraction of drinking water (mainly for bottling purposes) is creating water scarcity issues; Wild animals pose a serious concern as they destroy the crops. <u>Social issues:</u> <ul style="list-style-type: none"> Markets have not been linked to provide way for organic farming so people are scared to take the risk. Need financial support or request for retaining walls to be established to address erosion in the area.
5. Rehabilitation of Dewahuwa Irrigation Scheme 13 th February, 2019	Village level consultation – Focussed group discussion	Dewahuwa Farmer Organization officers (representing 8), Tank fisheries association, Irrigation Department, IWWRMP PMU,	District Irrigation Engineer, stating that the inadequacy of the 2 months during the dry season for the successful completion of headworks (in particular the rip-rap and sluice rehabilitation). – farmers were willing to forego a season. They also involve in other field crop cultivation along with paddy. <u>Environment:</u>

		WB Safeguards consultants.	<ul style="list-style-type: none"> No major environmental concerns were identified for the area. Only concern was the lack of access to potable water to some of the famer community. This should be further investigated. <p><u>Social:</u></p> <ul style="list-style-type: none"> On the sale of the produce, the farmers are faced with severe problems in reaching a fair price as they have to give most of their produce to private mills. The government does not have capacity to buy all the produce. Women have a major role in these communities through the ownership of the land is with male parties (this is the village tradition as land gets handed down). In 3 of the FOs women have leadership roles. And whenever the men are not available the spouses will be the representatives. There are women's farmer organizations working with the Agrarian Services which supports their livelihoods Tension was noted between the FOs and the fisheries association. It is important that that all stakeholders are included in the discussions. While the IE stated that legal status is with the Irrigation Department, there is a clear need for more coordination between the responsible authorities (Irrigation, Fisheries and Agriculture), both at the higher level and the field level. There was a request for skilled and unskilled employment during the rehabilitation work in the tank and Canal system.
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<p>4. Consultation meeting on Component 1</p> <p>Held at the Teldeniya District Secretariat</p> <p>13th February, 2019</p>	<p>Consultation with the tea small holders.</p>	<p>Farmers from the tea smallholder committees in the region, MMAIRD, TSHDA, MASL, PMU, WB safeguards consultants</p>	<p>Altogether, 207 Team Small-Holder Committees in operation in the region and only handful attended the meeting.</p> <p><u>Environment:</u></p> <ul style="list-style-type: none"> • Some of the Tea Small-Holders are currently engaged in soil conservation activities, using various methods, and with the financial support (albeit a fraction -25%- of the cost) of the Tea Small-Holders Authority. However the remaining cost that is left for them to cover prevents them all getting involved in the proper way. • They are faced with wildlife conflicts as they come in and dig and destroy some of the crops and also some of the soil conservation practices. • Potable water is also a issue in some of the areas. <p><u>Social:</u></p> <ul style="list-style-type: none"> • Tea plucking should be carried out once a week but it sometimes extends to 10 days to 2 weeks due to lack of labour resources. This has become a serious concern. This is mainly associated with the low wage rate. • Machine plucking may have to be considered. • It was discussed as to the need for a special workforce to be established for tea plucking like for coconut plucking at a higher wage. • The produce is usually sold to private traders (intermediaries) who frequently play out the small-holders. There was a request for transport support
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			<p>under the new project to be able to get a better price.</p> <ul style="list-style-type: none"> • The need for improved access (roads) was identified to facilitate better marketing and livelihood opportunities. • Though there is no representation of women in the committees, however, when the men are busy they step in (this is most of the time). • About 50% of the women are without jobs and they identified the need for more opportunities for home based/ village activities for them.
<p>5. National Consultation for Environmental and Social Safeguards inclusion on the proposed Sri Lanka Water Resources Management Project</p> <p>Monday 18th February, 2019, 2 – 3.45pm</p> <p>Venue: Mahaweli Authority, 500 T B Jayah Mawatha, Colombo 01</p>	<p>National level consultation where more than 100 stakeholders from Government institutions, NGOs, relevant research organizations, women's organizations, academia, etc. were invited.</p> <p>Only three invitees participated.</p>	<p>MASL, EFL, WB, University of Peradeniya, University of Jayawardenapura and University of Colombo.</p>	<p>Though the forum was meant for a diverse set of stakeholders, participation was low. The project interventions by component were presented by the PMU Project Director. Thereafter, the purpose of the meeting was explained briefly by the WB Environmental Safeguards officer and opened for discussion. The key points that were raised at the meeting were:</p> <ul style="list-style-type: none"> • In water resources management of forested areas, DWLC involvement is crucial as animals do not set boundaries in their movements. RDA was another agency identified as another very important participant as they often work in isolation and contribute large scale soil erosion and degradation. DMC was also highlighted as an important entity. These are in addition to the usual stakeholders – ones that are usually not involved in a integrated manner. • Secretary to the MMAIRD reiterated that there are about 20 agencies represented in the committees.

			<ul style="list-style-type: none"> • It was questioned as to whether there a climate risk assessment being done under the project to which WB consultant responded positively. Climate change modelling will be done for flood and droughts. • The need to learn from similar projects to ensure we correct things that had gone wrong was highlighted. Need to assess the capacity to implement and follow for continuity was highlighted. Since this is a comprehensive project – it was identified as a good opportunity ensures a robust program. • The need for a more integrated approach was identified where all key stakeholder agencies coordinate and work together. • Some implications of reforestation were discussed. It will be a long term process and introduction of native species will require protection and care for atleast 5 years so constraints and practical issues will have to be addressed. More details are provided in Annex 21-7. <p>The final outcomes were that technical consultations should be carried out from time to time to bring in the local experiences and expertise.</p> <p>The ESMF and RPF with all other project relevant documentation will be disclosed within a few weeks. These documents will be sheared via email to those present at the meeting.</p>
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Chapter 9 – Grievance Redress Mechanism

9.1 Features of GRM

The GRM will essentially provide affected parties within the project areas, with access to a mechanisms that are legitimate, reliable, transparent, and cost-effective to enable them to present their grievances and find solutions that satisfy their needs and aspirations. The GRM will provide the platform with the institutions, instruments, methods, and processes by which a resolution to a grievance is sought and provided. A number of mechanisms are available to aggrieved parties to access redress depending on the nature, complexity and diversity of the grievance. The GRM will also provide a platform for conflict resolution (to the extent possible) for resolving conflicts between affected persons and / or other stakeholders and can provide information sought by the public on the project. The GRM for IWWRMP has been developed and detailed under the parallel RPF for the project and is summarized in the section below.

9.2 Proposed GRM for the project

The proposed three-tier grievance redress system for the project would function at local (DS level) and regional level (District level), with recourse to a national-level body for appeal and for ensuring high-level government commitment, policy support and coordination for the process (a three level GRM). The Proposed Grievance Redress Mechanism is implemented through Grievance Redress Committees (GRC) appointed as follows.

Composition of Grievance Redress Committee (GRC) – Grama Niladhari Level

This is the most basic, first level committee that will operate at site level, most likely as a committee at GN Division level. The Committee will try to resolve the grievances of persons who live in the immediate project area. The proposed composition of the committee would include a combination of government and community representatives who would try to resolve grievances in an amicable manner through a process aimed at achieving consensus.

Grama Niladari of the area	Chairman
Representative from the local PMU Site Office	Secretary
Representative of Supervision Consultant (as appropriate)	Member
Representative of Contractor (if required)	Member
Representative of a local social organization (NGO/CBO)	Member

A representative of the community or local religious leader	Member
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Composition of Grievance Redress Committee (GRC) – Divisional Secretary Level

This committee is expected to address complaints and disputes that cannot be resolved by the Grama Niladhari level committee. In addition to hearing appeal cases coming from lower level (GN level) committees, this committee could support the national level committee, providing information and administrative support. This committee will review decisions coming from GN level committees within 15 working days and will communicate its decision to the claimants and GN level committee within five working days for follow-up actions. The committee consists of following members:

Divisional Secretary of the area or a representative nominated by the DS	Chairman
Representative from the PMU Head Office	Secretary
Grama Niladhari of the area from which the grievance was registered	Member
A representative from an NGO/CBO operative in the area	Member
A respected religious leader/clergy of the area or Community Leader	Member

Composition of Grievance Redress Committee (GRC) - National level

This GRC should be located in the Ministry of Mahaweli ,Agriculture, Irrigation and Rural Development and shall be chaired by an Additional Secretary of the Ministry or a designated representative. The Project Director would serve as the secretary to the committee. As well as guiding and supervising the grievance system, this committee would review appeals from people who are not satisfied with the decisions of the lower level committees. The committee would comprise the following members:

Additional Secretary/MMAIRD	Chairman
Project Director (of the PMU)	Secretary
Representative of the Supervision firm	Member
Representative from construction firm (if necessary)	Member
District Secretary of the District or a representative nominated by the	Member

Divisional Secretary of the area or a representative nominated by the DS	Member
Representatives from a Social Organization (if necessary) (A national level NGO/CBO operating in the field and have operations in project area)	Member

The national level GRC will only be convened when a complaint or grievance is raised by an affected person that cannot be resolved at the lower levels. The following are some issues that could typically be elevated up at different levels of GRC:

- Entitlement or eligibility for non-cash benefits
- Dust, noise and vibration nuisance at the construction site
- Loss of access
- Damages to public and private property (especially damage caused by vibration/pile driving)
- Removal of religious shrines, statues or trees
- Problems caused to public due to road closure
- Storage of construction material obstructing community activities

For the GRM to be effective, it will be necessary to explain and publicize the procedures. The General Public, Public Officers, Social Organizations, Contractors and Divisional Secretaries in the respective areas should be aware of the procedures for GRM (Refer RPF for the full description).

Specific major grievances and complaints regarding environmental compliance will be dealt by the CEA at the state level. The CEA has district offices but the district offices often lack resources to carry out environmental compliance functions at the level required. Environmental complaints are often related to dust, noise, and water pollution arising from construction activities. Complaints pertaining to negative environmental impacts are initially dealt with by district CEA offices with the help of line department and agencies. Delays in completion of hearings are frequently noted. Resorting to the court system for redress is always an option available to a grieved party. A few grievances reach the Court of Appeal for arbitration each year. In addition, another GRM will be established to address complaints involving GBV along with designated personnel to follow up on GBV cases and maintain database and records on GBV.