

Sri Lanka: Dam Safety and Water Resources Planning Project

**Environmental Assessment and Management Framework
(EAMF)**

**Ministry of Irrigation and Water Resources Management
Government of Sri Lanka
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SRI LANKA: DAM SAFETY AND WATER RESOURCES PLANNING PROJECT

Environmental Assessment and Management Framework (EAMF)

Introduction

The purpose of this document is to outline a Framework for Environmental Assessment & Management, giving brief details of potential Environmental issues typically associated with regarding and rehabilitating Dams with safety risk and guidelines on how to prepare Environmental Management Plans (EMP). Environmental Assessment & Management Plans (EAMP) will serve as a template to undertake appropriate Environmental Analysis and Impact Assessment of Sub Projects once the Dams requiring upgrading and rehabilitation have been identified. The EMAF is being submitted in view of a Project Environmental Assessment and has formed the basis for appraising the Environmental Aspects of the Project.

1.0 Purpose

1.1 The Government of Sri Lanka (GOSL) has requested financing from the World Bank to undertake a Dam Safety and Water Resources Planning Project (DSWRPP). One of the main development objectives of the proposed project is to improve the development and management of water resources within the country, reduce water induced hazards to the public, and enhance the effectiveness of water related investments. This will be achieved through; improving dam safety and operational efficiency; upgrading and modernizing the hydro-meteorological information system, providing technical assistance and pilot interventions for integrated water resources planning and management; and supporting institutional development and capacity building of the concerned national agencies in those areas. The section on the project description would provide more details on the activities proposed under the project.

1.2 Projects and Programs financed with IDA resources need to comply with World Bank Operational Policies. Therefore, all activities, sub-projects and components eligible for funding under DSWRPP will be required to satisfy the World Bank's safeguard policies, in addition to conformity with environmental legislation of the Government of Sri Lanka (GOSL). The activities to be financed by the project would result in overall environmental benefits since the development objectives of DSWRPP is to improve water resource and asset management to ensure public safety, reduce water induced hazards and enhance the effectiveness of water related investments in the country. However, all activities under the Dam Safety Assurance and Operational Efficiency Improvement component, in particular will require environmental assessments.

1.3 Since the initial work under the Dam Safety Assurance and Operational Efficiency component is to assess safety risks of dams and appurtenances prior to decisions being made as to the necessity and extent of upgrading, environmental assessments of the upgrading activities cannot be undertaken until safety assessments are

completed. Since safety assessments are part of the project and cannot be undertaken until after project effectiveness, specific environmental assessments cannot be undertaken prior to appraisal. Therefore, this Environmental Assessment and Management Framework (EAMF) has been prepared which will outline the procedure to undertake environmental assessments (EAs) and will also serve as a template for EAs, once the safety assessments have been completed. The only other activity that may have adverse environmental impacts may be civil works related to facilities for upgrading the hydro-meteorological information system. The EAMF addresses the environmental assessment requirements for such activities as well. Sub-project specific EAs or EMPs will be undertaken for all activities in the first year of the project prior to appraisal. This will most likely include EMPs for civil works related to facilities for upgrading the hydro-meteorological information system. EAs for work financed under the Dam Safety Assurance and Operational Efficiency component will be undertaken only after the specific dams have been identified during the safety assessment study, which will be completed after project effectiveness.

1.4 Adhering to the principles and procedures laid out in this EAMF will ensure compliance with the World Bank's environmental safeguard policies and the relevant provisions under the National Environmental Act (NEA) and associated regulations. The document will provide the necessary background for environmental considerations to be built into the design of the project so that environmentally sustainable implementation can take place. To aid this process, the EAMF highlights relevant general policies, guidelines, codes of practice and procedures to be taken into consideration for integration of environmental aspects into the project design.

1.5 World Bank policies and guidelines, pertaining to environmental safeguards¹ that require consideration under this project, as these will most likely be triggered, are as follows:

- OP/BP/GP 4.01 Environmental Assessment
- OP/BP/GP 4.37 Safety of Dams
- OP/BP/GP 4.11 Physical Cultural Resources
- OP/BP/GP 4.04 Natural Habitats

2.0 Project Description and Components

2.1 The objective of this project is to reduce dam-related hazards and improve water resources planning. This would be achieved through three main project components: (i) improving dam safety and operational efficiency; (ii) upgrading and modernizing the existing hydro-meteorological information systems; and, (iii) providing technical assistance for developing integrated water resources plans for selected river basins. Each project component would include institutional development and capacity building for the implementing agencies (IAs). In addition to the above three components, the project would include a fourth component to support project management and monitoring.

¹ This Framework addresses *only* Environmental Safeguard Policies of the World Bank and NEA. A separate Framework has been prepared to address Social Safeguards.

Component 1: Dam Safety and Operational Efficiency (US\$52 million):

2.2 The outcome of this component would be enhanced public safety of selected high-risk dams, sustainable institutional arrangements for effective dam safety management and efficient O&M. This component would comprise: (i) Remediation works for 20 high-risk dams, out of 38 major dams for which risk assessments have been made, managed by the Irrigation Department (ID), Mahaweli Authority of Sri Lanka (MASL), Central Electricity Board, (CEB) and National Water Supply and Drainage Board (NWS&DB); (ii) Provision of basic safety and operational facilities for 80 major and medium dams; (iii) Collection of basic engineering and operational information essential for sustainable operation and management of the 80 dams, (iv) Technical assistance for risk assessment on the remaining portfolio of 42 dams, training in dam safety, development of O&M manuals, codes of practice and operating procedures, including the procurement and adoption of modern software for hydrological and structural analysis of dams; and (v) Establishment of an inter-organizational arrangement for regular dam safety inspection, a sustainable need-based O&M funding mechanism and assistance for the establishment of dam safety regulation.

Component 2: Hydro-meteorological Information System (US\$8 million)

2.3 The expected outcome of this component would be enhanced staff capacity and physical and analytical infrastructure for monitoring hydro-meteorological data, detecting and forecasting water hazards and assessing water resources for multi-sectoral planning, development and management. This component would comprise: (i) Establishment of 9 new and 41 upgraded hydrometric stations to supplement and strengthen the existing hydrometric network, collection of reliable water level records and computation of river flows; (ii) Modernizing 30 agro-meteorological stations by supplying instruments that meet international standards to provide information for agricultural and irrigation planning and for the general public; (iii) Establishment of data banks at the ID and the Department of Meteorology (DoM) and improving the analytical capability of staff; (iv) Establishing procedures and providing tools and training for real-time analysis of flood situations in the influent streams of some major reservoirs; and (v) Groundwater monitoring and assessment.

Component 3: Multi-sectoral Water Resources Planning (US\$ 6.5 million)

2.4. The expected outcome of this component would be water resource development plans at national level and for selected river basins and enhanced institutional capacity and skills for water resources planning and management. This component would comprise: (i) Development of a national water-use master plan, based on updated estimates of present and future multi-sectoral demand and supply to meet the long-term social and economic development targets of the country;. (ii) Preparation of a New Mahaweli Water Resources Development Plan based on an optimization study on usage of available water resources in the Mahaweli and adjoining connected river basins considering present and future intra- and inter-sectoral water usage and demand and national and regional development priorities - - Feasibility reports would be prepared for several potential projects for implementation on a priority basis, based on the New Development Plan (with a view to obtain external donor funding); (iii) Preparation of a holistic water resources development plan and management proposals for the Mundeni

Aru river basin (of the Eastern Province) using modern analytical tools and preparation of feasibility reports for at least one priority water resources development project in the Mundeni Aru river basin; and (iv) Establishment of institutional arrangements, processes/procedures, manuals, state-of-art techniques, modern analytical tools and skill development for multi-sectoral water resources planning and management.

Component 4: Project Management and Monitoring (US\$ 5.5 million)

2.5 The objective of this component is to ensure smooth implementation of project activities as well as monitoring of and learning from project processes and outputs. This component would assist the PMU and project implementing agencies to execute, manage and monitor the project. The assistance would include the provision of consultants, vehicles, equipment and incremental staff and operating costs.

Additional Financing

Additional funding of US\$ 80 million has granted for the next stage of the project and 28 new dam sites have been identified for implement the next step of the project

3.0 Government of Sri Lanka Environmental Regulations and Procedures

3.1 The National Environmental Act (NEA) has made Environmental Assessments (EA) a legal requirement for a range of development projects. A list of projects requiring an EA is prescribed in Gazette (Extra Ordinary) No. 772/22 dated June 24, 1993. Accordingly, all river basin development and irrigation projects excluding minor irrigation works requires an EIA, the guidelines are ambiguous about the EIA requirement for upgrading and rehabilitation of existing dams. However, agreement has been reached with the Central Environmental Authority (CEA) and Ministry of Agriculture, Irrigation and Mahaweli Development that all dam upgrading and rehabilitation and related activities financed under this project as well as any other activities that may lead to potential adverse environmental impacts will be required to undertake an environmental impact assessment, commensurate with the potential for environmental impacts and prepare detailed EMPs (including a dam safety plan, where applicable) that will be included for implementation as part of the civil works Contractor's contract documents. A detailed description of the environmental legislative framework in Sri Lanka for environmental impact assessment and management is in Annex 1.

3.2 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.

3.3 Forest Ordinance – No. 17 of 1907 and subsequent amendments. The Forest Ordinance of Sri Lanka is the law for conservation, protection and management of forest and forest resources for the control of felling and transport of timber and forest related matters. The Forest Ordinance of No. 17 of 1907 amended by several Acts up to 1995 – Act 34 of 1951, No. 49 of 1954, No. 13 of 1966, No. 56 of 1979, No. 13 of 1982, No. 84 of 1988, and the new Act No. 23 of 1995. Under Section 4 of Act No. 23 of 1995, the Minister is in charge of forests, has special powers to order and declare any specified area of State land or the whole or any specified part of any reserve forest which has unique ecosystems, genetic resources or a habitat or rare and endemic species of flora, fauna, micro-organisms and of threatened species which need to be preserved in order to achieve an ecological balance in the area by preventing landslides and fire hazards to human life, as a Conservation forest.

Under Section 5 of the Act, a Forest Officer of a specified area has special power to stop any public or private way or watercourse in a reserved forest. It shall be lawful for the District Secretary to determine the amount of compensation to be paid, in case that the water course injuriously affects the interests or one or more individuals to whom on that account compensation should be paid.

Under Section 6 of the Act, the following activities are prohibited:

Trespassing or permits cattle to trespass,

Causes any damage by negligence in felling any tree, cutting or dragging any timber,

Wilfully strips off the bark or leaves from, or girdles, lop, taps, burns or otherwise damages any trees,

Poisons water,

Quarries stone, burns lime or charcoal, or collects or subjects to any manufacturing process, any forest produce,

Extracts coral or mollusc shells or digs or mines for plumbago, gems or other minerals,

In contravention of any regulations made by the Minister, pastures cattle, hunts, shoots, fishes or sets traps or snares or guns, or constructs, ambushes, or uses any explosive substances.

4.0 Adequacy of GOSL Environmental Clearance

4.1 The composite GOSL environmental clearance process, in principle, is consistent with World Bank environmental and public disclosure requirements. The exception being the screening criteria adopted in the GOSL process under the NEA, where project thresholds are used to determine the type of clearance required and the content of public consultation. However, all activities under the proposed project will be subjected to the EIA process regardless of the project threshold or whether or not it is a prescribed project under the NEA, which will be a pre-requisite to disbursement of funds. Although the CEA's regulated EIA procedure is about a decade old, substantial progress has been made by the CEA and Project Approving Agencies (PAA's) in evaluation of EIAs. Institutional strengthening of the CEA has been supported by projects financed by

USAID, NORAD, Government of the Netherlands, ADB and the World Bank over the last few years. Therefore, it is not anticipated that additional TA is needed to support CEA for institutional strengthening for environmental clearance relevant to this project.

4.2 Although the GOSL's clearance procedure is adequate fairly reliable, IDA will still review all EIAs and EMPs prepared for all relevant activities under the project and provide necessary concurrence for the approval of disbursements of funds.

5.0 World Bank Environmental Safeguard Policies and its Relevance to the Dam Safety and Water Resources Planning Project

5.1 Projects financed with IDA resources normally need to comply with World Bank Operational Policies. World Bank OP 4.01 requires environmental assessment (EA) of projects proposed for Bank financing to help ensure that these projects are environmentally sound and sustainable. EA is a process whose breadth, depth and type of analysis depends on the nature, scale and potential for environmental impacts of the proposed project. A 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. 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.

5.2 As described earlier, the Dam Safety and Water Resources Planning Project has a component that involves Dam Safety Assurance and Operational Efficiency Improvement. While it is anticipated that the project overall is environmentally beneficial since the development objectives of the project is to improve water resource and asset management to ensure public safety, reduce water induced hazards and enhance the effectiveness of water related investments in the country, there is concern that the scale and potential of adverse environmental and social impacts in the event of a dam failure, could be significant, irreversible and unprecedented. Yet, since the objective of the project is to rehabilitate dams that may pose a safety risk, and proactive measures will be taken to strengthen such dams so that the safety risk is minimized, it is not anticipated that there will be any significant, irreversible and unprecedented adverse environmental impacts due to project financed activities. Therefore, this project has been classified as a Category B project for safeguards purposes.

5.3 World Bank OP 4.01 is very clear that for all Category A, Category B and Category FI projects proposed for financing under an IDA Credit, the developer must consult project affected groups and local non-governmental organizations (NGOs) about the projects environmental aspects and take their views into account in the design and implementation. The EA should particularly incorporate such comments to improve social acceptability and environmental sustainability. Such consultations should be

initiated as early as possible, in the Project cycle and it is mandatory that consultations are undertaken after the draft EA is prepared. In addition, the developer is expected to consult with stakeholders throughout project implementation as necessary to address EMP related issues that affect them. The OP 4.01 also highlights the importance of analyzing alternative designs, technologies and operational strategies systematically in terms of their potential environmental impacts in order to select the most environmentally friendly and economically viable option.

5.4 *OP/BP/GP 4.01 Environmental Assessment:* The purpose of conducting an environmental assessment (EA) is to identify environmental and social consequences of the proposed sub-projects or components, in order to:

- Ensure the identification of potential environmental issues and social concerns early in the implementation of a proposed project to incorporate necessary safeguards in project design in order to prevent potential adverse impacts by determining appropriate mitigation and compensation measures;
- Minimize risks and enhance positive impacts/benefits;
- Avoid delays and extra costs which may subsequently arise due to unanticipated environmental problems;
- Identify the potential for maximizing environmental resources management and socio-economic benefits to local communities within the scope of the sub-project.

5.5 The EA should cover physical-chemical, biological, socio-economic and cultural issues that are likely to arise during upgrading and rehabilitation of dams with safety risks and appurtenance structures and associated activities as appropriate.

5.6 As of this stage, details of specific sub-projects and sites are not available and hence as a result, site-specific Environmental Assessments (EA) cannot be conducted. What is possible at this stage would be to carry out an identification of generic issues that are typically associated with upgrading and rehabilitation of dams with safety risks and appurtenance structures and associated activities, as proposed under the project, and apply the information to site specific EAs, as and when the relevant details become available. In such circumstances, OP 4.01 requires that arrangements be made whereby the project implementing institutions undertake the functions of sub-project screening, EA review and implementation of mitigation and monitoring plans. Therefore the purpose of this document is to outline a framework for environmental assessment and management, giving brief details of potential environmental issues typically associated with upgrading and rehabilitating dams with safety risks and guidelines on how to prepare Environmental Management Plans (EMP). The EAMF will serve as a template to undertake appropriate environmental analysis and impact assessments of sub-projects, once the dams requiring upgrading and rehabilitation have been identified. This EAMF is being submitted in lieu of a project EA and has formed the basis for appraising the environmental 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 Infoshop in accordance with Access to Information requirements of disclosure. Detailed EAs for individual sub- projects will be carried out (in accordance with the EAMF) by the

implementing agencies

and will be reviewed and cleared by the designated Project Approving Agency (PAA), as applicable, under prevailing national environmental legislation in Sri Lanka and by IDA prior to the approval for disbursement of funds.

5.7 *OP/BP 4.37 Safety of Dams:* The World Bank's safeguard policy on Safety of Dams is based on the principle that, for the life of a dam, the owner (in this case the Government of Sri Lanka) is responsible for ensuring that appropriate measures are taken and sufficient resources are 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 a new dam it finances and existing dams on which a Bank financed project is directly dependent. Upgrading and/or rehabilitation of existing dams, as proposed under DSWRPP, falls within the policy, thus OP/BP 4.37 is triggered. Under the proposed project IDA, based on a safety risk assessment of selected existing dams and appurtenances, will be financing the upgrading/rehabilitation of high risk dams in Sri Lanka. OP/BP 4.37 requires that the dam upgrading be designed and its civil works be supervised by experienced and competent professionals. It also requires that GOSL adopt and implement certain dam safety measures for the design, bid tendering, construction, operation and maintenance of the dam and associated works.

5.8 For 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, such as the dams that will be supported under the DSWRPP project, OP/BP 4.37 requires that investigations, designs, construction and operation of the dam be reviewed by an independent panel of experts. The panel should also review detailed preparation 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.

5.9 The Panel will consist of three or more experts, appointed by GOSL and acceptable to IDA, 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.

5.10 *OP 4.04: Natural Habitats:* This policy 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. This policy has been triggered mainly on precautionary basis because some of the project sites will be within or adjacent to protected natural habitat .

5.11: OP/BP 4.11 Physical Cultural Resources: 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 EMPs. Under this policy too it is essential to ensure any formal clearances/approvals are taken from relevant government authorities as per National legislations.

The proposed operations pose limited risks of damaging physical cultural resources since it involves the rehabilitation of historic earthen dams that in some areas hold cultural significance. The impacts will mostly be positive as rehabilitation of these dams will ensure they are further preserved and maintained thus the trigger is predominantly a positive one. Nevertheless, the following procedures for identification, protection from theft, and treatment of discovered artifacts should be followed and included in standard bidding documents as provided in Annex 2.

6.0 Preliminary Assessment of Environmental Issues Relevant to this Project

6.1 The dam network in Sri Lanka comprises over 350 medium and large dams and over 12,000 small dams. Maintenance, safety oversight and rights of use are shared among several ministries and agencies of GOSL. The multitude of stakeholder's results in poor coordination and frequently, a lack of accountability in maintenance of the dam network. Therefore, there is a critical need for improved oversight of the dam network and proper coordination of functions, especially related to safety.

6.2 Among the potential adverse impacts due to a lack of proper accountability and under funding of maintenance and a weak emphasis on dam asset management, lies the possibility of dam failures which would result in loss of life and property as well as adverse environmental impacts. These adverse impacts can be caused as a result of poor

operation and maintenance and could require costly upgrading and rehabilitation periodically. Considering the potential risk to communities downstream of dams, it is necessary that vulnerable populations are properly educated about the risks posed as well as mitigation measures. Preparation of proper Emergency Preparedness Plans and educating vulnerable communities is an essential element of dam management and should be addressed when preparing the EAs.

6.3 The nature and scale of environmental impacts will be determined by the type of interventions undertaken by the project to assist in upgrading and rehabilitating the dams that have been identified as a safety risk. Since the nature of the risks is unknown until the Safety Assessment is completed, the section below identifies and describes the environmental implications that could possibly arise under the project.

6.4 Since the DSWRPP project will be financing only upgrading and/or rehabilitation of existing dams, many of the serious environmental consequences will not be encountered since the dams are already in existence. Direct impacts as a result of construction activities undertaken to upgrade or rehabilitate the dam, such as air and water pollution from construction activities as well as solid waste/debris disposal are issues that need to be addressed. Resource extraction for construction purposes is a critical issue in Sri Lanka, therefore, proper resource extraction sites with appropriate GOSL licenses are a mandatory requirement for contractors and resource availability needs to be evaluated in the specific EAs.

6.5 In addition to direct environmental impacts of the upgrading and/or rehabilitation, typical environmental issues that arise in a dam project are not limited to the downstream areas which could be as far down as the estuaries or coastal zone, but also extends to the upper limits of the catchment. Proper management of the catchment and the watershed is essential for ensuring the economic benefits envisioned from the dam are met.

6.6 GOSL's investment in upgrading and/or rehabilitating selected dams under the DSWRPP project will not yield the anticipated long term benefits unless there is proper management of the watersheds in the catchment areas. Major environmental factors affecting the functioning and the life span of the dam are those caused by land, water and other resource use in the catchment areas above the reservoir. Increased pressure on upland areas above the dam is a common phenomenon caused by the resettlement of people from the inundated areas and by uncontrolled influx of people to the watershed. On site environmental deterioration as well as a decrease in water quality and an increase in sedimentation rates in the reservoir result from clearing forest land for agriculture grazing pressures, use of agricultural chemicals and illegal timber felling for commercial purposes. It is therefore, essential that dam projects be planned and managed in the context of overall river basin and regional development plans, including both the upland catchment areas above the dam and floodplain and watershed areas downstream. If such impacts are considered significant, the EA should identify measures that need to be implemented by the relevant GOSL agencies in order to ensure proper management of the upstream areas. Since public awareness is a critical issue in better practices of upstream management, the EA should explore feasible options for improving such awareness.

6.7 It has been identified that there is no operational policy on environmental safeguards in the current management structure of existing dams in Sri Lanka. Virtually all dams studied indicated that there is no seismic instrumentation or other automated alarm systems that could be operated in case of an emergency. In addition, many of the reservoirs are currently subject to ad hoc and haphazard disposal of garbage, construction debris and industrial and domestic wastewater. If this practice continues, the costs incurred in upgrading the dams will not yield the expected benefits since the reservoir volume and water quality will be adversely affected by the practice of solid and liquid wastes disposal. Since the dam heights are not being raised under this project, there are no environmental issues that may arise due to increased inundation. It has been observed that there is a need for proper and regular enforcement relevant national legislation pertaining to land use on reservations, and the watershed and catchment areas. Since these issues have an implication on the long term use and sustainability of the reservoir, these should be addressed in the EIAs. It is also known that there is unauthorized extraction of water and sand from the feeder canals, which needs to be controlled and monitored. Sub-project specific EAs should evaluate the relevance of such issues to the specific dam being upgraded and/or rehabilitated.

6.8 During the preparation of the TOR for sub-project specific EIAs the above issues and concerns should be kept in mind and the EIA should evaluate these aspects and the EMPs should contain mitigation measures so that the long term sustainability of the investment is ensured.

6.9 The only other component that may trigger the Bank's environmental safeguard policies is the construction of buildings under various components of the project. These impacts, if any are expected to be minimal. If the construction work is to be located on sites where the implementing agency has existing buildings, it is not anticipated that any real environmental concerns may arise. Therefore, for such sites Codes of Practice that currently exist within GOSL Building Codes should be adhered to. Since the exact locations of new buildings is not known at this stage and may not be known at appraisal, a limited Environmental Analysis will be done during project implementation prior to disbursement of funds for that particular activity. Since the potential environmental impacts are expected to be minimal, an Environmental Management Plan will be prepared for each relevant activity. The main impacts of building construction for such sites will be off-site impacts due to resource extraction for construction. In order to avoid encouraging illegal extraction of building material such as sand, clay and timber, all construction contracts under this project will include clauses in the contracts to ensure that sand, clay and timber are obtained from authorized locations and sources that are licensed by relevant GOSL authorities. All building construction and renovation will adhere to the existing building and other applicable codes of practice in Sri Lanka. To ensure that the building contractor is responsible for adherence to the Codes of Practice (ICTAD specifications), the following codes should be included in the contract documents:

- SCA/3/1 - Irrigation and land Drainage
- SCA/3/2 - Water Supply, Sewerage & Storm Water Drainage
- SCA/3/3 - Reclamation Works

SCA/3/4	-	Ground Water Exploration & Exploitation
SCA/4	-	Building Works (Vol I)
SCA/4	-	Building Works (Vol II)
SCA/6	-	Coastal Harbour Engineering Works
SCA/8	-	Electrical & Mechanical Works

In addition, any other Standard Specifications approved by the Government of Sri Lanka should also be included.

6.10 The Contractor is required to pay attention to and address the following in the Environmental Management Plan:

1. Electromagnetic radiation– issues such as the location of telecommunication towers and consequences of permitting such towers to be built on top of buildings, buildings near H/T cables etc.
2. Addressing noise pollution during construction activities.
3. Cultural Features preservation of culturally significant buildings.
4. Ecological issues of the sites
5. Transport and access to site.
6. Overshadowing and access to daylight and sunlight, with possible options for passive solar design and its effect on site layouts.
7. External appearance (aesthetics)
8. Floodwater protection provisions.
9. Designing appropriate landscaping.
10. Energy conservation and efficiency.
11. Waste disposal, salvage, re-use and recycling of materials.
12. Avoidance of hazardous materials.
13. Safety, security and fire.
14. Energy efficient lighting options.
15. Potential for sick building syndrome

6.11 If any land filling is required for site preparation such as filling of low lying lands and full Environmental Impact Assessment (not only an Environmental Management Plan) will be a condition for IDA financing.

6.12 In addition for buildings to be constructed on new lands, an Environmental Screening Checklist will be first prepared and based on the findings of the Checklist, a decision will be made by IDA whether further detailed environmental assessments is needed. A sample checklist is attached in Annex 3.

7.0 Scope and Structure of the Environment Impact Assessment Report

7.1 The EIA would cover the following issues:

Policy, Legal and Administrative Framework:

A brief description of the policy, legal and administrative setting under which the

proposed project is to be implemented.

Project Description:

A brief description of the nature and objectives of the proposed project and how it functions or operates, including the proposed location and why it was chosen.

Baseline Data:

This section would include a brief description and evaluation of the current environmental situation in the project area. This would include a qualitative description of the existing environmental and social conditions in the project area including atmospheric, aquatic and terrestrial systems as well as a socio economic baseline survey.

Environmental Impacts:

This section would identify potential environmental impacts that would arise as a result of the proposed project. All cumulative effects will be should be considered – positive and negative, direct and indirect, long term and short term.

Analysis of Alternatives:

This section would address alternatives for the proposed action, which would include the risks of a “no project” alternative as well as other alternatives considered before selecting the proposed action.

Mitigation Measures:

This section would include a detailed explanation of how the potential environmental and social impacts identified above could be mitigated.

Monitoring Plan:

This section should include a long term plan for monitoring to ensure that there no adverse impacts due to the project.

Environmental Management Plans:

The most important section of the EA would be the section on Environmental Management Plans (EMPs). EMPs should be prepared after taking into account comments from both, the PAA and IDA as well as any clearance conditions. In view of this, a more detailed explanation of EMPs is given below

8.0 Guidelines for preparation of Environmental Management Plans

8.1 Having identified the potential impacts of the relevant sub-component, the next

step of the EA process involves the identification and development of measures aimed at eliminating, offsetting and/or reducing impacts to levels that are environmentally acceptable during implementation and operation of the project (EMP). EMPs provide an essential link between the impacts predicted and mitigation measures specified within the EA and implementation and operation activities. World Bank guidelines state that detailed EMP's are essential elements for Category A projects, but for many Category B projects, a simple EMP alone will suffice. While there are no standard formats for EMPs, it is recognized that the format needs to fit the circumstances in which the EMP is being developed, and the requirements which it is designed to meet. EMPs should be prepared after taking into account comments from the PAA and IDA as well as any clearance conditions. Annex C of OP 4.01 of the World Bank safeguards outlines the important elements of the EMP and guides its preparation. Given below are the key elements that constitute an EMP, but the project proponent and their consultants are advised to refer to Annex C of OP 4.01 for more details.

8.2 Contents of a Environmental Management Plan

a. Identification of impacts and description of mitigation measures

Firstly, Impacts arising out of the project activities need to be clearly identified. Secondly, feasible and cost effective measures to minimize impacts to acceptable levels should be specified with reference to each impact identified. Further, it should provide details on the conditions under which the mitigatory measure should be implemented (ex; routine or in the event of contingencies) The EMP also should distinguish between type of solution proposed (structural & non structural) and the phase in which it should become operable (design, construction and/or operational).

b. Enhancement plans

Positive impacts or opportunities arising out of the project need to be identified during the EA process. Some of these opportunities can be further developed to draw environmental and social benefits to the local area. The EMP should identify such opportunities and develop a plan to systematically harness any such benefit.

c. Monitoring program

In order to ensure that the proposed mitigatory measures have the intended results and complies with national standards and World Bank requirements, an environmental performance monitoring program should be included in the EMP. The monitoring program should give details of the following;

- Monitoring indicators to be measured for evaluating the performance of each mitigatory measure (for example national standards, engineering structures, extent of area replanted, etc).
- Monitoring mechanisms and methodologies
- Monitoring frequency
- Monitoring locations

d. Institutional arrangements

Institutions/parties responsible for implementing mitigatory measures and for monitoring their performance should be clearly identified. Where necessary, mechanisms for institutional co-ordination should be identified as often monitoring tends to involve more than one institution.

e. Implementing schedules

Timing, frequency and duration of mitigation measures with links to overall implementation schedule of the project should be specified.

f. Reporting procedures

Feedback mechanisms to inform the relevant parties on the progress and effectiveness of the mitigatory measures and monitoring itself should be specified. Guidelines on the type of information wanted and the presentation of feedback information should also be highlighted.

g. Cost estimates and sources of funds

Implementation of mitigatory measures mentioned in the EMP will involve an initial investment cost as well as recurrent costs. The EMP should include costs estimates for each measure and also identify sources of funding.

h. Contract clauses

This is an important section of the EMP that would ensure recommendations carried in the EMP will be translated into action on the ground. Bidding and Contract documents will need to be incorporated with clauses directly linked to the implementation of mitigatory measures. Mechanisms such as linking the payment schedules to implementation of the said clauses should be incorporated and implemented, as appropriate.

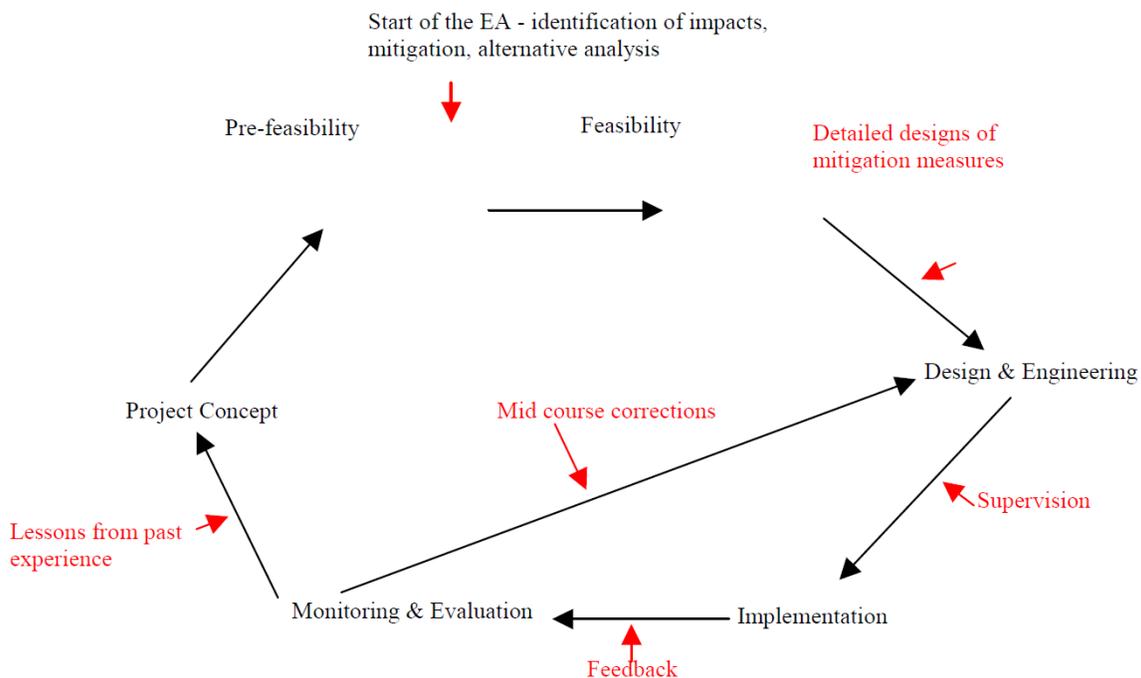
Consultation with affected people and NGOs in preparing the EMP will be an integral part of all Category A projects and is recommended for Category B projects.

Minutes of all consultations held should be documented and filed accordingly.

9.0 Institutional Arrangements for conducting the Environmental Assessment

9.1 It is required that a separate environmental impact assessment be conducted for each dam to be upgraded and/or rehabilitated. Once the details of the dam safety assessment and the quality of the appurtenance structures is available and the GOSL (in consultation with IDA) selects the priority dams requiring upgrading and rehabilitation, the implementing agency in consultation with the CEA is required to prepare a draft Terms of Reference (TOR) for a detailed EIA and submit it to IDA for review and clearance. Upon IDA clearance of the TOR, the project proponent through hired

consultants will carry out the EA/EMP and submit the report to the CEA/PAA and informally to IDA for review and subsequent approval. Approval for the project will be subject to certain conditions, which will have to be implemented and monitored over the lifetime of the project. Upon receiving formal approval from the PAA, the EA/EMP will be forwarded to IDA for formal concurrence, as IDA is unable to provide formal clearance until the required national clearances are obtained. IDA clearance of the EIA is a pre-requisite for disbursement of funds for the civil works. Once the project is approved and implemented, monitoring of implementation progress of each sub-project will be carried out periodically by the project proponent, the PAA and IDA. Monitoring carried out by the project proponent will be more frequent (quarterly) and the progress will be fed back to the PAA and IDA, through formal reports. This type of frequent monitoring is very important for mid-course correction.



10.0 Assessment of the institutional capacity of the institutions involved in the review, approval and monitoring of the environmental assessments.

10.1 Central Environmental Authority (CEA)

10.1.1 Central Environmental Authority has pioneered the effort of introducing and implementing the EA process as a planning and decision making tool in the development activities of the country. Since its introduction a decade ago, the CEA has gathered considerable experience and expertise in managing the EA process and has benefited from numerous capacity building and training projects supported by various donor agencies. The CEA is presently overseeing the EA procedures for a large hydropower project with a dam – the Upper Kotmale Hydropower Project. As of present, a separate

division with adequate technically qualified staff is engaged in EA procedures on a full time basis. In a recent development the CEA has strengthened its presence in the regional areas by establishing 4 regional offices that will most likely be focal points in the future in monitoring out of local EA clearance conditions, which would be very relevant to the DSWRPP project as well. However, it is understood that although the CEA has achieved quite high standards in implementing EA procedures, monitoring of post implementation impacts is a weak area that needs to be strengthened. Therefore, the project will strengthen the capacity of the CEA's Regional staff through the Divisional Environmental Officers (DEOs) to monitor the implementation of the EIA clearance conditions and the EMPs.

10.2 *Ministry of Irrigation and Water Resources Management*

10.2.1 In addition to CEA monitoring, the Consultants hired under the project for supervision of the construction will include a contractual obligation to monitor the EIA clearance conditions and the implementation of the EMP, overseen by the Ministry of Irrigation and Water Resources Management. The project will build capacity in the implementing ministry to monitor environmental and social safeguards of this project with an intention to institutionalize environmental and social safeguards monitoring in the respective Ministry.

10.3 IDA Oversight: Finally, regular IDA supervision missions will include Environmental and Social Specialists to monitor the project's compliance with the World Bank's environmental and social safeguard policies.

Environmental Legislation in Sri Lanka

National Environmental Act

In 1981 GOSL passed the National Environmental Act (NEA) and in 1982, created the Central Environmental Authority (CEA) as a regulatory and enforcement agency. The CEA's statutory and enforcement powers were strengthened significantly in 1988, by an amendment to the NEA. A cabinet level ministry to handle the subject of environment was created in 1990, with the appointment of a Minister of Environment to ensure that environmental issues will be given the required attention.

Under provisions of Part IV C of the NEA No. 47 of 1980 as stipulated in Gazette (Extra Ordinary) No. 772/22 dated June 24, 1993 GOSL made Environmental Assessment (EA) a legal requirement for a range of development projects. The list of projects requiring an EA is prescribed in the above Gazette notification. In addition, the Gazette notification includes a list of line ministries and agencies that are designated as Project Approving Agencies (PAA), with environmental assessment clearance functions delegated by the CEA. With the change of government in August 1994, and the resulting re-allocation of Ministries, a new list of PAAs were specified—under subject area rather than with the name of the Ministry, as listed originally—in Gazette (Extra Ordinary) No. 859/14 dated February 13, 1995.

According to provisions of the NEA regulations, the only prescribed project type under the water resources and irrigation sector relevant to the DSWRPP project requiring an EA is “all river basin development and irrigation projects, excluding minor irrigation works”. The Gazette Notification is ambiguous with regard to EIA requirements of upgrading and rehabilitation of existing dams. However, it has been agreed with GOSL that all dam upgrading and/or rehabilitation activities supported under DSWRPP will conform to EIA regulations regardless to the ambiguity. In addition, other prescribed projects requiring environmental assessments, listed in the same regulations that may be relevant to the proposed project include; (i) Reclamation of land, wetland area exceeding 4 hectares; (ii) Conversion of forests covering an area exceeding 1 hectare into non-timber forest uses; (iii) Involuntary resettlement exceeding 100 families, other than resettlement effected under emergency situations; (iv) Extraction of timber covering land areas exceeding 5 hectares; (v) clearing of land areas exceeding 50 hectares; and (vi) All projects and undertakings irrespective of their magnitude, if located partly or wholly within 100 meters from the boundaries of or within any area declared under the National Heritage Wilderness Act; the Forest Ordinance; 60 meters from a river or stream bank and having a width of 25 meters or more at any point of its course; any archeological reserve, ancient or protected monument as defined or declared under the Antiquities Ordinance (Chapter 188); any areas declared under the Botanical Gardens Ordinance; and within 100 meters from the boundaries of or within any areas declared as a Sanctuary under the Fauna and Flora Protection Ordinance.

The EIA approval/disapproval can be granted by the PAA with jurisdiction over the project activity, only with the concurrence of the CEA. However, the project proponent

is not permitted to perform the functions and duties of a PAA. Therefore, in the event of a PAA becoming the project proponent, the CEA will designate an appropriate PAA. In instances where the project would fall within the purview of more than one PAA, the CEA will determine an appropriate PAA or serve as the PAA. Any functions of the PAA related to the approval of the project can be devolved to a Provincial Council only with written concurrence of the Minister in charge of the subject of Environment. Considering the scope of activities supported under this project, the most likely PAA's would be the CEA, or the Ministry of Agriculture, Irrigation and Mahaweli Development. The CEA will formally decide on the PAA depending on the scope and location of the project on a case by case basis.

According to GOSL procedure, all development activities require environmental clearance. In order to obtain such clearance, the project proponent has to fill in a Basic Environmental Information Questionnaire. The questionnaire requires information from the project proponent to enable the CEA to determine the level of environmental analysis required prior to providing approval for the project. Upon reviewing the questionnaire, the CEA determines whether the project requires an Initial Environmental Examination (IEE), or an Environmental Impact Assessment (EIA), or whether no further environmental analysis is required, depending on the nature of the potential impacts. The CEA review is based on the list of prescribed projects listed under provisions of Part IV C of the NEA No. 47 of 1980 as stipulated in Gazette (Extra Ordinary) No. 772/22 dated June 24, 1993. All prescribed projects have to be subjected to environmental assessments, either through IEEs or EIAs. The CEA also determines the PAA for the specific project. The EA process as described under the NEA applicable to this project is outlined in Annex 2.

Other Legislation relevant for Environmental Assessment

In addition to the National Environmental Act, which is the most important legislation governing the process of EA, there are three other legislations under which EA can be required.

Coast Conservation Act (CCA) No.57 of 1981 implemented by the Coast Conservation Department (CCD) and applicable to the coastal zone as defined in the Act. The coastal zone as it pertains to this project is considered to be 300 meters inland from the high water mark. Therefore, any road works within this zone falls under the jurisdiction of CCD. 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. Once the type of environmental analysis required is decided, a scoping committee comprising of the relevant stakeholder agencies meet to discuss issues of the project after which a draft ToR is prepared for review by the Coast Conservation Advisory Council. The EA prepared accordingly by the project proponent is subsequently reviewed by a Technical Evaluation Committee based on whose assessment the Director can grant approval/disapproval for the project. The public consultation process is similar to that of the NEA where the public has the opportunity to comment on the proposed development within a period of 30 days from time of notification, if it is an EIA.

Fauna and Flora Protection Ordinance (FFPO) No.2 of 1937 (amended in 1993) implemented by the Department of Wildlife Conservation. This act specifies that any development activity that takes place within one mile of the boundary of a National Reserve declared under the Ordinance require an EIA/IEE. 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 of the Department of Wildlife Conservation.

Provincial Environmental Act (PEA) of 1991 implemented by the North Western Provincial Council 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 scoping process is similar to that of the NEA and will be headed by one of the two listed PAAs; (a) Provincial Environmental Authority and (b) Provincial Ministry of Fisheries and Aquaculture. Representation of the CEA and the Ministry of Environment in the scoping committee is a mandatory requirement. Setting up of the ToR, preparation of the EA, review and public disclosure and consultation, granting of the project decision are the same as specified in the NEA.

EIA and IEE Procedure in Sri Lanka

The EIA Procedure

In the event that an EIA is required, the PAA in consultation with CEA, is responsible for subjecting the preliminary information to environmental scoping, in order to set the Terms of Reference (TOR) for the EIA. The TOR is prepared by a Technical Committee (TC) comprising experts in the relevant field, appointed by the PAA. In developing the TOR, the regulations provide for the PAA to consider the views of state agencies and the public.

Upon submission of the EIA by the proponent, the PAA is required to determine whether issues referred to in the TOR have been addressed and notify the proponent of any inadequacies within 14 days. In the event any inadequacies are identified, the proponent is required to make necessary amendments and resubmit the report. Once accepted, in addition to the EIA being forwarded to the CEA by the PAA, notice is also placed in the Government Gazette and in a national newspaper published daily in Sinhala, Tamil and English languages inviting the public to make written comments, if any, to the PAA within 30 days from the date of first appearance of the notice. According to the legislation, public consultation is mandatory is only at this stage of the EA process. Informal consultation with NGOs, interested groups and civil society may occur during early stages of the EA as determined by the PAA depending on the type of project and public interest in the project. The notification would specify the times and places at which the EIA would be available to the public. As a minimum the report would be available at the CEA, PAA and in a GOSL agency in the locality (Colombo and outstation) of the proposed project. The environmental regulations have provisions for public hearings on the project although it is not mandatory. The PAA can use its discretion and hold a public hearing if it would be in the interest of the public. The PAA is required to forward all comments, either written or raised during any public hearing, to the project proponent for review and response within 6 days of completion of the public comment period. The proponent is required to respond to all such comments in writing to the PAA.

The TC appointed by the PAA would then evaluate the EIA and require the project proponent to respond to any queries raised by the TC. The TC would also evaluate the adequacy of the proponent's response to any comments raised during the public comments period. Upon completion of the evaluation of the TC, the PAA with the concurrence of the CEA, would grant approval for the implementation of the proposed project subject to specified conditions or refuse approval for implementation of the project, with reasons for doing so. The notification must be made within 30 days of the receipt of responses from the proponent. The PAA is required to specify a period within which a the approved project should be completed. In the event the proponent is unable

to complete the project within the specified period, written permission for an extension has to be obtained from the PAA, 30 days prior to the expiration date.

The PAA is responsible for forwarding a report which contains a plan for monitoring the implementation of the approved project, to the CEA, within 30 days from granting approval. It is also the responsibility of the PAA to publish in the Government Gazette and in one national newspaper published in Sinhala, Tamil and English languages, granting approval for the project. It is mandatory that the project proponent inform the PAA of any alterations to the project as approved and/or the abandonment of the project. The PAA shall, where necessary, obtain fresh approval in respect of any such alterations that are intended to be made to the approved project. The PAA in consultations with the CEA, would also determine the scope and the format of the supplemental report required to be submitted for such alterations.

The IEE Procedure

Upon review of the preliminary information provided by the proponent, if the PAA determines that the project would have no long-term adverse environmental impacts, an initial environmental examination (IEE) would be considered adequate. Under such circumstances, the proponent will be required to submit a detailed IEE for review and approval by the PAA. The IEE will identify potential environmental and social issues and the complexity of possible remedial actions. Upon reviewing the IEE, if the TC identifies any substantial environmental issues that may arise as a result of the proposed project, the proponent will be required to undertake a detailed EIA. In the event the IEE is considered adequate, then the project proponent is requested to prepare an Environmental Management Plan (EMP), to address any potential environmental and social issues as well as incorporate the PAA/CEA's approval conditions. The IEE review process is similar to the EIA review process, except for the level of detail and analysis involved, which is proportionate to the anticipated environmental and social impacts. The CEA has developed a custom made IEE questionnaire for mini hydropower projects. The Environmental Questionnaire for Mini Hydro Projects is more detailed than the general IEE questionnaire and is designed to capture environmental issues specific to mini hydro projects. This questionnaire is used by the CEA/PAA to determine whether the potential project results in long term irreversible or complex environmental and social issues and if so, it warrants an EIA. If no EIA is required, the proponent is required to prepare an EMP which contains remedial measures to address adverse environmental and social issues. The IEE is not required by law to be opened for the public for comments and does not go through the public consultation process required for an EIA.

**Environmental Checklist for Assessing Suitability of Locations for Rehabilitation of
Dams in New Sites financed under the DSWRPP Project**

To be filled by an authorized official

(Where choices are given please circle the most appropriate entry or entries) No

	Item	Details			
INTRODUCTION					
1	Name of the Site				
2	Province				
3	District				
4	Divisional Secretary Division (s)				
5	Local Authority				
6	Grama Niladari Division (s)				
7	Brief description of the project (Be as brief as possible, confining to main elements only, provide a 1:10,000 scaled site map inclusive of area within 500m radius from the project site)				
8	Does the site /project require any;	Yes	No	If yes give the extent (in ha)	
	Reclamation of land, wetlands				
	Clearing of forest				
	Felling of trees				
9	Minimum land area required for the proposed development (based on UDA guidelines) (ha)				
10	Available total land area within the identified location (ha)				
11	Expected construction period				
12	Responsible contact person with contact Information				
13	Present Land Ownership	State	Private	Other (specify)	
14	Source of Funding				
15	Total Cost of the Project				
16	Anticipated Date of Completion				
DESCRIPTION OF THE ENVIRONMENT					
PHYSICAL					
17	Topography & Landforms (map sheet/ if detailed maps are available provide them)	Attach an extract from relevant 1: 50,000 topographic			
18	Relief (difference in elevation)	Low <20m	Medium 20-40m	High 40-60	>60m
19	Slope	Low <30%	Medium 30-40 %	High 40-60 %	Very High > 60%
20	Position on Slope	Bottom	Mid-slope	Upper-	
21	Soil (Great Soil Group) – Pls see the				

	list below					
22	Soil Depth	Shallow < 20cm	Moderate 20 – 100 cm	Deep >100cm		
23	Soil Erosion	Low	Medium	High		
24	Climate	Wet Zone	Intermediate Zone	Dry Zone/ Semi Arid Zone		
25	Annual dry period					
26	Source of fresh Surface Water	Spring/canal	Tank/Reservoir	Perennial Stream	Seasonal Stream	None
27	Distance from the coast line (m)					
28	Surface Water Use	Domestic	Washing/Bathing	Irrigation	Animal use	
29	Surface Water Quality	Poor	Moderate	Good		
30	Ground Water Availability	Dug Well	Tube Well	Other (specify)		
31	Ground Water Use	Domestic	Washing/Bathing	Irrigation	Animal use	
32	Ground Water Quality	Poor	Moderate	Good		
33	Incidence of Natural Disasters	Floods	Prolonged droughts	Cyclones/tidal waves	Other	
34	Geological Hazards	Landslides	Rock falls	Subsidence	Other	
ECOLOGICAL						
35	Habitat Types in the Project Site (indicate the % of each habitat type)	Natural forest (%), degraded forest(%), natural scrubland(%), degraded scrubland(%), riverine forest, grassland(%), abandoned agricultural land(%), marsh(%), lagoon(%), estuary(%), coastal scrub(%), mangrove(%), salt marsh(%), home-gardens(%), Other (%) (List)				
36	Habitat types within 250m radius from the site periphery (indicate the % of each habitat type)	Natural forest (%), degraded forest(%), natural scrubland(%), degraded scrubland(%), riverine forest, grassland(%), abandoned agricultural land(%), marsh(%), lagoon(%), estuary(%), coastal scrub(%), mangrove(%), salt marsh(%), home-gardens(%), Other (%) (List)				
37	Habitat types within 500m radius from the site periphery (indicate the % of each habitat type)	Natural forest (%), degraded forest(%), natural scrubland(%), degraded scrubland(%), riverine forest, grassland(%), abandoned agricultural land(%), marsh(%), lagoon(%), estuary(%), coastal scrub(%), mangrove(%), salt marsh(%), home-gardens(%), Other (%) (List)				
38	Are there any environmentally and culturally sensitive areas within 250m?	Protected Areas	Migratory pathways of animals	Archeological sites	Wetlands	Mangroves strands
39	Are there any plants of conservation importance within 250m (endemic and threatened species)? If yes, encouraged to provide a list					
40	Are there any animals of conservation importance within 250m (endemic and threatened species)? If yes, encouraged to provide a list					

ENVIRONMENTAL SENSITIVITY

41	Does the project wholly or partly fall within any of the following areas?				Yes	No	Unaware
	Area						
	100m from the boundaries of or within any area declared under the National Heritage Wilderness Act No 4 of 1988						
	100m from the boundaries of or within any area declared under the Forest Ordinance (Chapter 451)						
	Coastal zone as defined in the Coast Conservation Act No 57 of 1981						
	Any erodible area declared under the Soil Conservation Act (Chapter 450)						
	Any Flood Area declared under the Flood Protection Ordinance (Chapter 449)						
	Any flood protection area declared under the Sri Lanka Land Reclamation and Development Corporation Act 15 of 1968 as amended by Act No 52 of 1982						
	60 meters from the bank of a public stream as defined in the Crown Lands Ordinance (Chapter 454) and having width of more than 25 meters at any point of its course						
	Any reservations beyond the full supply level of a reservoir						
	Any archaeological reserve, ancient or protected monument as defined or declared under the Antiquities Ordinance (Chapter 188).						
	Any area declared under the Botanic Gardens Ordinance (Chapter 446).						
	Within 100 meters from the boundaries of, or within, any area declared as a Sanctuary under the Fauna and Flora Protection Ordinance (Chapter 469)						
	100 meters from the high flood level contour of or within, a public lake as defined in the Crown Lands Ordinance (Chapter 454) including those declared under section 71 of the said Ordinance						
	<i>Within a distance of one mile of the boundary of a <u>National Reserve</u> declared under the Fauna and Flora Protection Ordinance</i>						

ENVIRONMENTAL IMPACT AND MITIGATION / ENHANCEMENT DURING CONSTRUCTION PERIOD

	IMPACT					MITIGATION/ ENHANCEMENT
		H	M	L	N/A	
42	Soil erosion					
43	Water pollution					
44	Noise pollution					
45	Solid waste generation					
47	Loss of vegetation cover					
48	Habitat loss or fragmentation					
49	General disturbance to animal behaviour					
50	Interference with normal movement of animals					
51	Irreversible/irreparable environmental change					

ENVIRONMENTAL IMPACT AND MITIGATION / ENHANCEMENT DURING OPERATION PERIOD					
52	Sewerage Disposal	Cess Pool		Sewage Pond	
		Septic Tank		Other	
53	Solid Waste Disposal				
54	Drinking Water Supply	Common Dug Well	Yes / No	Individual dug well	Yes / No
		Common Tube Well	Yes / No	Town supply – pipe	Yes / No
		Spring	Yes / No	Town supply – Stand post	Yes / No
55	Alteration to storm water drainage pattern	No changes	No major Changes	Major changes	
CONTACT DETAILS OF OFFICIALS AND RECOMMENDATIONS					
56	Name of the officer completed the form (From the Developer)				
57	Designation and contact Information				
58	List of team members				
59	Overall observation and recommendation				
60	Signature and date				
61	Name and Contact Information of the officer who checked this form (CEA officer from Regional Office/Divisional Environmental Officer)				
62	Remarks				
63	Signature and Date				

**Great Soil Groups of Sri Lanka

Dry Zone

1. RBEReddish Brown Earths
2. LHG Low Humic Gley
3. NBS Noncalcic Brown Soils
4. RYL Red-Yellow Latosols
5. A Alluvial Soils
6. SS Solodized Solonetz
7. R Regosols
8. G Grumusols
9. IBL Immature Brown Soil

Annex 2

Protection of Cultural Property

1. Cultural property include monuments, structures, works of art, or sites of significance points of view, and are defined as sites and structures having archaeological, historical, architectural, or religious significance, and natural sites with cultural values. This includes cemeteries, graveyards and graves.

2. The proposed operation poses limited risks of damaging cultural property since subprojects will largely consist of the rehabilitation of existing Dams that have cultural value but have not been demarcated as such by any legal provisions. The rehabilitation of the Tanks will have a net positive benefit as it will ensure the cultural integrity of historical earthen tanks are maintained and preserved. The following procedures for identification, protection from theft, and treatment of discovered artifacts should be followed and included in standard bidding documents for contracts along with provisions on environmental management.

Chance Find Procedures

3. Chance find procedures will be used as follows:

(a) Stop the construction activities in the area of the chance find; (b) Delineate the discovered site or area;

(c) Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be present until the responsible local authorities and the Ministry of Cultural Affairs & Arts/ Archeological Department take over;

(d) Notify the supervisory Engineer who in turn will notify the responsible local authorities and the Ministry of Cultural Affairs & Arts/ Archeological Department immediately (within 24 hours or less);

(e) Responsible local authorities and the Ministry of Cultural Affairs & Arts/ Archeological Department would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archeologists of the Ministry of Cultural Affairs & Arts/ Archeological Department (within 72 hours). The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values;

(f) Decisions on how to handle the finding shall be taken by the responsible authorities and the Ministry of Cultural Affairs & Arts/ Archeological Department . This could include changes in the layout (such as when finding an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration and salvage;

(g) Implementation for the authority decision concerning the management of the finding shall be communicated in writing by the Ministry of Cultural Affairs & Arts/ Archeological Department ; and

(h) Construction work could resume only after permission is given from the responsible local authorities and the Ministry of Cultural Affairs & Arts/ Archeological Department concerning safeguard of the heritage.

4. These procedures must be referred to as standard provisions in construction contracts, when applicable, and as proposed in section 1.5 of Attachment 6. During project supervision, the Site Engineer shall monitor the above regulations relating to the treatment of any chance find encountered are observed.

5. Relevant findings will be recorded in World Bank Project Supervision Reports (PSRs), and Implementation Completion Reports (ICRs) will assess the overall effectiveness of the project's cultural property mitigation, management, and activities, as appropriate.