

Vietnam

RENEWABLE ENERGY DEVELOPMENT PROJECT

Environmental Safeguards Framework (ESF)

(Updated)

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Ministry of Industry and Trade

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Acronyms and Abbreviations

DONRE	Department of Natural Resources and Environment
BOD ₅	Biological Oxygen Demand
COD	Chemical Oxygen Demand
DO	Dissolved Oxygen
DPA	District Protected Area
DSF	Dam Safety Framework
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EMP	Environment Management Plan
EMPF	Ethnic Minority Policy Framework
EP	Ethnic Minority Plan
EPC	Environmental Protection Commitment
ERR	Economic Rate of Return
ESF	Environmental Safeguards Framework
ICB	International Competitive Bidding
IDA	International Development Association
MOF	Ministry of Finance
MOIT	Ministry of Industry and Trade
MONRE	Ministry of Natural Resources and Environment
MOU	Memorandum of Understanding
MW	Megawatt
NBCA	National Biological Conservation Area
NGO	Non-governmental Organization
NPA	National Protected Area
OM	Operation Manual
PB	Participating Bank
PMB	Project Management Board
PPA	Power Purchase Agreement
PPC	Provincial People Committee
QCBS	Quality and Cost Based Selection
RAP	Refinancing Application Package
RE	Renewable Energy
REDP	Renewable Energy Development Project
ROW	Right of Way
RP	Resettlement Plan
RPF	Resettlement Policy Framework
SA	Social Assessment
SEA	Strategic Environmental Assessment
SPPA	Standard Power Purchase Agreement
TA	Technical Assistance

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1. Introduction

1.1. Project Description

The objective of the Renewable Energy Development Project (REDP) is to increase the supply of least-cost electricity to Vietnam's national grid from renewable energy sources on a commercially sustainable basis and in an environmentally and socially sustainable manner. The project has three components: (1) Investment Project Implementation Component, (2) Regulatory Development Component, and (3) Pipeline Development Component. This Environmental Safeguards Framework is designed for the Investment Project Implementation Component.

The Investment Project Implementation component will provide (i) a re-financing facility to participating commercial banks (PBs) for loans to eligible renewable energy subprojects below 30 MW developed by private sponsors, and (ii) technical assistance for building the capacity of participating banks and project sponsors to prepare, appraise, finance, and implement renewable energy subprojects according to international best practices. The component has two subcomponents as described below.

Subcomponent 1: Credit to Support Renewable Energy Investments (total financing \$234.38 million, of which IDA will provide \$150 million)

Private developers will develop subprojects of below 30 MW based on small hydro, wind, and biomass technologies in accordance with REDP criteria, while incorporating WB environmental and social safeguards. Developers will commit at least 20% in equity funding and will approach four PBs for lending of up to 80% of each subproject's total project cost.

The four PBs, which have been selected on a competitive basis, will appraise eligible renewable energy subprojects proposed by developers and provide loans to subprojects that meet all loan requirements. The PBs will lend to subprojects on commercial terms determined by market forces and will bear the full credit risk of the funds. Eligible loans will be re-financed up to 80% of PBs' lending, or 64% of total project cost for each subproject. PBs will commit at least 16% of total subproject costs to each subproject and project developers will contribute 20% of total subproject costs as equity. Upon approval of an application for re-financing a loan, the respective PB will receive REDP re-financing through MOF. REDP's contribution will be based on IDA funding lent to the MOF on IDA terms.

It is estimated that some 20 subprojects (95% for small hydro and 5% for biomass or wind) will be supported by the re-financing facility, averaging some 10-11 MW and with an average project cost of about US\$ 12 million. When fully operational, these subprojects are expected to comprise about 210 MW of installed capacity producing about 880 GWh of electricity annually.

Subcomponent 2: TA for Investment Project Implementation (total financing \$2.43 million, of which \$1.35 million from IDA and \$0.65 million co-financed by TF)

The TA part of Component 1 will support the overall management of REDP, verification of eligibility for re-financing, and capacity building at PBs, developers/investors and others. The Project Management Board (PMB) of MOIT will manage this TA facility.

The TA facility will support the developers by providing them the necessary skills to identify eligible projects, prepare proposals for bankers, navigate the approval process, and negotiate financing. This would include, *inter alia*, training for conducting feasibility studies, design optimization, construction management, operation, maintenance, management of financial risks, and identification, and assessment and management of environmental and social impact risks.

The TA facility will support the PBs by enabling them to understand the risks of investment in renewable energy subprojects, supervise such subprojects with respect to potential environmental and social issues, prepare credit policies for such subprojects, and appraise subprojects against those policies.

The TA facility will also provide resources for project management of REDP by the PMB. If required, the TA facility would also assist the Administrative Unit (AU) of MOIT to evaluate subprojects against the eligibility criteria.

The project restructuring is necessary to meet its development objective and includes (i) improving refinancing terms and conditions; (ii) simplifying loan application and disbursement approval procedures; (iii) carrying out institutional changes combined with an extension for the project closing date for two years to June 30, 2016; and (iv) for triggering a new policy, the Policy on Projects on International Waterways (OP 7.50).

1.2. Typology of Eligible Renewable Energy Projects

Only loans for eligible renewable energy projects can be refinanced. A renewable energy project can be refinanced if:

- It has an installed capacity of 30 MW or less;
- 100% of its energy generation shall be from Renewable Energy (renewable non-fossil energy sources: wind, solar, geothermal, hydropower, biomass¹); and

A loan for a project cannot be refinanced under REDP if the project does not meet the above criteria. However, at the present time, the most likely portfolio will be mainly hydroelectric and to a lesser extent biomass. Wind power development is still at an incipient stage in Vietnam and there are no known feasible projects that meet the 30 MW limit restriction. The same is applicable to other renewable sources (solar, geothermal). By including all renewable sources in

¹ Biomass means the biodegradable fraction of products, waste and residues from agriculture (including vegetal and animal substances), forestry and related industries, as well as the biodegradable fraction of industrial and municipal waste.

the framework, the project will encourage the development of new sources in Vietnam. Each such new project will be processed on a project-by-project basis.

Investment requirements and project descriptions will vary from subproject to subproject. A description of the typology of expected REDP subprojects follows:

Hydroelectric Subprojects: They include reservoir-based hydroelectric plants and upgrading of existing hydroelectric plants. The development of a new reservoir-based hydroelectric subproject includes the construction of reservoirs, dams, tunnels, canals, penstocks, access roads and a powerhouse. It also includes the construction of electrical stations and substations and the installation of transmission and distribution lines from the hydropower plant to the nearest entry point to the national grid. These subprojects depend on a water storage reservoir upstream of the dam where water flow can be controlled according to the power demand. In contrast, run-of-the-river subprojects do not require the construction of a reservoir, or they do, it is very small (less than 20 hectares of flooded area). Run-of-the-river plants can be installed in places where the water head and the steady flow rate are high enough. Upgrading of existing plants involves the improvement and expansion of some of the components in order to increase the installed generating capacity. Construction of reservoir, headworks, canals, tunnels, penstocks, access roads, powerhouse and transmission lines may be required.

Wind Subprojects: Most wind subprojects use weather-resistant, and aerodynamically designed wind turbines attached to generators to convert the mass movement of wind into electric energy. Typical modern wind turbines have a capacity of 1-2 MW. Each wind project will consist of the installation of turbines, associated civil and electrical works, a control room, a switchyard, access road and a transmission line from the wind farm to the nearest entry point to the national grid. The number and precise layout of turbines in each wind farm will depend on the design selected by the private developer.

Solar Power: Photovoltaic cells transform solar energy into electrical energy without intermediate mechanical devices. However, many hours of sun are needed to satisfied demand. Currently, this method is used in small-scale projects and costs need to be lower before widespread use is possible. Solar subprojects are not expected as part of the REDP.

Biomass Subprojects: These subprojects utilize biological sources such as wood, sugar cane, crop residues, dung, individual and municipal wastes to generate steam and produce electricity. Subprojects may include forest plantations for the production of wood and increased agricultural production for suitable crops. Each biomass project will consist of the installation of biomass-to-electricity conversion plant, steam turbines, associated civil, mechanical and electrical works, a control room, a switchyard, and a transmission line from the project site to the nearest entry point to the national grid.

1.3. Potential Subproject Impacts

Based on the experience of similar projects in Vietnam and elsewhere, renewable energy subprojects can give rise to a variety of environmental impacts. The potential environmental impacts can be associated with the power production facilities; wind, water barrage or biomass

supply infrastructure; as well as ancillary infrastructure including construction work camps; temporary and permanent access roads; offices and other temporary structures; substations and transmission lines.

Potential environmental impacts of such infrastructure include those associated with land clearing and construction activities; those associated with land conversion to a reservoir or changing downstream environmental flows; downstream impacts to water quality and aquatic biodiversity, aesthetic impacts of wind turbines; impacts associated with sourcing, collecting transporting and storing biomass for fuel; land use conflicts over production of biomass or construction of reservoirs and operational impacts such as noise and waste management. These impacts can also add to cumulative effects of other regional developments such as upstream and downstream hydropower, forestry and road infrastructure projects. The impacts can have implications on choices of project siting and design, and necessitate development of environmental management plans, resettlement plans, community development plans and approaches to manage cultural resources impacts. They can also affect natural habitats and forest management, and if associated with international rivers, could necessitate international dialogue.

During the parent project implementation a study on cumulative impacts and joint operation of the small-scale hydropower cascades supported by REDP was undertaken. The study shows that: (i) the cascades do not significantly alter river flows downstream of the lowest powerhouse; (ii) no impacts on agriculture; (iii) main effects are habitat fragmentation and loss of connectivity; (iv) large diversion of water from the river; (v) land take is not negligible; (vi) many dams do not have a facility to discharge an environmental flow from the reservoir; and (vii) operation rules for many hydropower plants do not (yet) stipulate an environmental flow or, if they do, the release is very small and unlikely to effectively mitigate the long periods of drying out of large stretches of the river. The recommended actions, which should be considered in the future investments, include: i) fish ladders; ii) fish breeding program; iii) corridors for wildlife migration; iv) enforcement of hunting rules; v) reconsideration of further small-hydropower development planning; and vi) corporate sustainability program of hydropower owner.

A summary of key environmental and social impacts by subproject type is shown in Table 1-1. Subproject developers are also recommended to consult Annex 4 that provides a checklist of key environmental and social concerns, or impacts, that could arise from subproject construction and operation.

1.4. Purpose of the Environmental Safeguards Framework (ESF)

REDP allows subprojects to be refinanced provided they meet basic eligibility and quality criteria that will help ensure the subprojects meet good international practice in technical, environmental and social terms and meet minimum levels of financial and economic performance.

At the time of application to the refinancing facility of REDP the subprojects will have prepared and received official approval for either an EIA and/or EPC from MONRE/DONRE, including the approvals of other Vietnamese government authorities.

The purpose of this framework is to ensure that the subproject to be financed under REDP also meets World Bank safeguard policy requirements. It provides guidance in the screening of subprojects for eligibility to receive funds from the REDP, and identifies additional information that may be needed to ensure compliance with WB Safeguards. The framework also describes the roles and responsibilities of the various institutions involved in meeting these requirements.

Table 1-1: Typical Environmental and Social Impacts Associated with Renewable Energy Subprojects**Phase: Construction**

Activity	Impact	Hydropower	Run of River	Wind	Solar	Biomass
Operation of construction equipment	Impaired air quality	x	x	x	x	x
	Noise	x	x	x	x	x
	Community and third party safety issues	x	x	x	x	x
Access roads	Impaired water quality	x	x			
	Increased deforestation and fragmentation	x	x			
Construction camps	Impacts on local communities	x	x	x	x	x
	Resource conflicts (e.g. water supply)	x	x	x	x	x
	Impaired water quality	x	x	x	x	x
Clearing and grading	Impaired water quality	x	x	x	x	x
	Increased erosion and sedimentation	x	x	x	x	x
	Dust	x	x	x	x	x
	Impacts on natural habitats and biodiversity	x	x	x	x	x
Flooding of reservoir	Impacts on natural habitats and biodiversity	x				
	Loss of productive forest	x				
	Impacts on physical cultural resources	x				
Operation of construction equipment	Impaired air quality	x	x	x	x	x
	Noise	x	x	x	x	x
	Community and third party safety issues	x	x	x	x	x
Access roads	Impaired water quality	x	x			
	Increased deforestation and fragmentation	x	x			
Construction camps	Impacts on local communities	x	x	x	x	x
	Resource conflicts (e.g. water supply)	x	x	x	x	x

	Impaired water quality	x	x	x	x	x
Clearing and grading	Impaired water quality	x	x	x	x	x
	Increased erosion and sedimentation	x	x	x	x	x
	Dust	x	x	x	x	x
	Impacts on natural habitats and biodiversity	x	x	x	x	x
Flooding of reservoir	Impacts on natural habitats and biodiversity	x				
	Loss of productive forest	x				
	Impacts on physical cultural resources	x				
	Resettlement	x				
	Impacts on Ethnic Minorities	x				
	Land Use Impacts	x				
Storage of fuel and hazardous materials	Spills and impaired surface and ground water quality	x	x	x	x	x
	Spill and impacts on soils	x	x	x	x	x

Phase: Operation

Activity	Impact	Hydropower	Run of River	Wind	Solar	Biomass
Operation of Renewable Energy Facility	Impaired downstream water quality	x				
	Reduction of environmental flows	x				
	Impact on downstream aquatic ecology	x				
	Impacts on fisheries and fish movements	x	x			
	Impacts on downstream water users	x				
	Noise	x		x		
	Waste Management	x	x	x	x	x
	Aesthetic impacts	x		x		
	Recreational and tourism impacts	x				
	Impacts on birds and wildlife			x		
	Human health			x		
	Cumulative effects	x	x			
	Air quality					x
	Impacts on Ethnic Minorities	x	x	x	x	x
	Storage and collection of biomass material					x
	Transmission lines and linear impacts	x	x	x	x	x
Greenhouse gas emissions	x					
Operation of Renewable Energy Facility	Impaired downstream water quality	x				
	Reduction of environmental flows	x				
	Impact on downstream aquatic ecology	x				
	Impacts on fisheries and fish movements	x	x			
	Impacts on downstream water users	x				
	Noise	x		x		
	Waste Management	x	x	x	x	x

	Aesthetic impacts	x		x		
	Land use conflicts	x				x
	Recreational and tourism impacts	x				
	Impacts on birds and wildlife			x		
	Human health			x		
	Cumulative effects	x	x			
	Air quality					x
	Impacts on Ethnic Minorities	x	x	x	x	x
	Storage and collection of biomass material					x
	Transmission lines and linear impacts	x	x	x	x	x
	Greenhouse gas emissions	x				
Storage of fuel and hazardous materials	Spills and impaired surface and ground water quality	x	x	x	x	x
	Spill and impacts on soils	x	x	x	x	x

1.5. Institutional Roles and Responsibilities

Table 1-2 shows the roles and responsibilities of the main actors in REDP. The main actors are as follows:

- **Developers** – responsible for design, construction and operation of renewable energy subprojects, including environmental assessment and management of subproject impacts. Responsible for preparation of the environmental management plan (EMP) in compliance with World Bank requirements.
- **Participating Banks (PB)** – responsible for providing subproject financing and to undertake a due diligence role to ensure subproject compliance to environmental and social commitments as part of loan agreement provisions.
- **Project Management Board (PMB)** – unit of the MOIT responsible for overall coordination and management of REDP.
- **Ministry of Finance (MOF)** – facilitates subproject financing to the participating banks upon assurances of the PMB that the subproject complies with project environmental and social commitments.
- **World Bank** – maintains and oversight role in REDP and may provide technical assistance and institutional strengthening in regard to implementation of subproject environmental and social commitments.

Table 1-2: Subproject Roles and ESF Responsibilities

Institution	Role in REDP	Responsibility in ESF
Developers	Developers have the main responsibility to design, build and operate their subprojects. They will ensure all technical and environmental regulatory requirements for approval by Vietnamese authorities have been obtained prior to application to REDP for subproject financing.	<p>Each developer is responsible for screening to establish the level of subproject environmental risk, preparation of an EMP if required, conducting and documenting a public consultation on the EMP, and public disclosure of the EMP. It is also responsible for EMP implementation, monitoring and follow-up procedures to ensure compliance with the EMP and Bank safeguards throughout the construction and operation period.</p> <p>During subproject implementation, developers will submit monthly progress reports on ESF compliance to the PBs.</p>
Participating Banks (PBs)	PBs provide loans to Developers and refinance 80% of the loans from the REDP credit facility.	<p>Each PB will make sure that the subproject meets all environmental eligibility criteria for REDP refinancing and is in compliance with WB environmental and social safeguards. It will review technical documentation submitted by the developers and undertake due diligence to ensure compliance with all Vietnamese environmental regulatory requirements and approvals. It will also review the EMP and ensure that EMP commitments form part of the loan agreement.</p> <p>During subproject implementation, each PB will supervise subproject implementation to ensure that the responsibilities and protocols specified in the EMP are being properly followed and document their findings as part of their overall reporting of subproject supervision.</p> <p>PB will submit quarterly progress reports on ESF compliance of REDP developers to the PMB.</p>
Independent Environmental Monitoring Consultant (IEMC)	The IEMC will assist the PMB in verifying EMP implementation by the developers.	The IEMC will provide support to PMB in monitoring the subproject EMP implementation in both construction and operation stages. IEMC will also be responsible to support PMB to prepare monitoring reports on EMP implementation.

Institution	Role in REDP	Responsibility in ESF
Project Management Board (PMB)	The PMB is responsible for the overall implementation of the REDP on behalf of MOIT.	<p>The PMB will approve the loan package, including verification of compliance with REDP environmental and social requirements and WB Safeguard Policies. The PMB will also obtain a no objection from the World Bank regarding the EMP.</p> <p>During implementation, the PMB will submit quarterly progress reports to the World Bank including a performance evaluation of the various institutions in regards to ESF compliance.</p> <p>The PMB, as required, will provide TA to developers and the PBs to assist them in improving their implementation performance.</p> <p>The PMB will establish and maintain a pool of qualified environmental consultants from which a developer may select to assist in meeting the requirements of the ESF.</p>
Ministry of Finance (MOF)	Provides financing to Participating Banks	Provides financing upon assurance of the PMB that subproject complies with environmental and social commitments.
World Bank (WB)	The WB will maintain an oversight role in the REDP and ensure compliance to environmental and social safeguards.	The World Bank will initially review the EMP of all subprojects to ensure compliance with ESF requirements. When satisfied that the document review and oversight process by the PBs and the PMB is satisfactory, the World Bank will limit its reviews to a more modest level. However, if the World Bank feels implementation is not acceptable and does not see any improvements it will recommend institutional capacity building measures to the PMB in order to correct any inadequacies.

2. ENVIRONMENTAL FRAMEWORK

2.1. World Bank Safeguards and their Application to the ESF

The World Bank's environmental and social safeguard policies are a cornerstone of its support to sustainable poverty reduction. The objective of these policies is to prevent and mitigate undue harm to people and their environment in the development process. These policies provide guidelines to the WB and borrowers in the identification, preparation, and implementation of programs and projects. The World Bank environmental and social safeguards that apply to REDP are listed below in Table 2-1.²

Table 2-1: Applicable WB Environmental and Social Safeguards to the REDP

Safeguard
OP/BP 4.01 Environmental Assessment (<i>1999, revised April 2013</i>)
OP/BP 4.10 Indigenous Peoples (<i>2005, revised April 2013</i>)
OP/BP 4.12 Involuntary Resettlement (<i>2001, revised April 2013</i>)
OP/BP 4.37 Safety of Dams (<i>2001, revised April 2013</i>)
OP/BP 7.50 Projects on International Waterways (<i>2001, revised March 2012</i>)
World Bank Policy on Access to Information (<i>2010</i>)

The Environmental Safeguards Framework (ESF) only considers WB environmental safeguards OP/BP 4.01 and OP/BP7.50; application of the Safety of Dams OP/BP 4.37 Safeguard is discussed in details under the Dam Safety Framework. Application of Social Safeguards, including Indigenous Peoples and Involuntary Resettlement are discussed in the Resettlement Policy Framework and Ethnic Minority Planning Framework. Technical Guidelines for application of each of the WB Environment and Social Safeguard Frameworks are provided in the Operations Manual.

A summary of the application of the pertinent World Bank Environmental Safeguards within the context of the ESF follows. A screening checklist is provided in Annex 2.

Environmental Assessment (OP/BP 4.01): In World Bank operations, the purpose of Environmental Assessment is to improve decision making, to ensure that subproject options under consideration are sound and sustainable, and that potentially affected people have been properly consulted. To meet this objective, the World Bank policy defines procedures to: (a) identify the level of environmental risk (screening) associated with a project, (b) assess the potential environmental impacts associated with the risk and how they should be reduced to acceptable levels (environmental assessment and management), (c) ensure the views of local groups that may be affected by the project are properly reflected in identifying the environmental risk and managing any impacts (public consultation), (d) make certain that the procedures

² A full description of the policies and their provisions may be found in the following link www.worldbank.org/safeguards.

followed in the environmental assessment process are adequately disclosed and transparent to the general public (disclosure) and (e) includes measures for implementation and supervision of commitments relating to findings and recommendations of the environmental assessment (environmental management plan).

For the purposes of REDP, *all projects under consideration will require an approved EIA or EPC from MONRE/DONRE and will require additional preparation of an EMP that meets WB standards as specified in the ESF.*

Public consultation and disclosure are essential elements of World Bank environmental assessment policy and the necessary procedures and documentation for consultation and disclosure under the REDP are described in this framework.

By limiting the size of projects up to 30 MW, and further screening particularly sensitive projects in critical natural habitats and cultural resources sensitive areas, it is expected that all sub-projects financed under the loan would receive a B Category for environmental purposes. Therefore, in addition to the EIA required and approved by MONRE/DONRE, each subproject will require the preparation of an Environmental Management Plan (EMP) in order to meet the requirements of the World Bank policies.

Natural Habitats (OP/BP 4.04): The Natural Habitats safeguard 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 that would lead to the significant loss or degradation of any Critical Natural Habitats, including those that are legally protected, officially proposed for protection or unprotected but of known high conservation value.

Natural habitats are defined as land and water areas where the ecosystems' biological communities are formed largely by native plant and animal species, and human activity has not essentially modified the area's primary ecological functions.

REDP projects in forested areas may be allowed under permit, if they do not result in significant degradation or conversion of habitats and/or forests in protected areas, proposed protected areas or areas that are considered of special ecological significance.

For the purposes of REDP, which does not trigger the policy on Natural Habitats, *a subproject will not be eligible for financing if it is determined that the Natural Habitats safeguard policy applies.* This determination will be done as part of the evaluation of the subproject environmental impact assessment and also part of the REDP screening process as described in Annex 3.

Physical Cultural Resources (OP/BP 4.11): The objective of this policy is to avoid, or mitigate, adverse impacts on cultural resources from development projects that the World Bank finances. Physical cultural resources include movable or immovable objects, sites, structures, groups of

structures, natural features and landscapes that have archeological, paleontological, historical, architectural, religious, aesthetic or other cultural significance.

As part of the subproject environmental impact assessment process, projects that have impacts on physical cultural resources that are legally protected, and/or considered especially important or sensitive particularly to local groups (e.g. gravesites), will not be eligible for financing under the REDP.

However, in the course of subproject implementation, an “accidental” or “chance find” of artifacts or structures important to Vietnam's cultural heritage may be uncovered. Annex 8 provides details of the “chance find” process for physical cultural resources.

For the purposes of the REDP, which does not trigger the policy on Physical Cultural Resources, *a subproject will not be eligible for financing if it is determined that the Physical Cultural Resources safeguard policy applies.* This determination will be done as part of the evaluation of the subproject environmental impact assessment and also part of the REDP screening process as described in Annex 3.

Safety of Dams (OP/BP 4.37): The Safety on Dams Safeguard requires that experienced and competent professionals design and supervise construction, and that the borrower adopts and implements dam safety measures through the project cycle. The policy also applies to existing dams where they influence the performance of a project. In this case, a dam safety assessment should be carried out and necessary additional dam safety measures implemented.

For the purposes of the REDP, a loan for a small hydro electricity project can only be refinanced if the subproject meets the dam safety requirements specified in the Dam Safety Framework (see Appendix 16 Operational Manual). The REDP Dam Safety Framework combines the World Bank requirements (OP 4.37 Safety of Dams) and Vietnamese national requirements so that a project complies both with World Bank OP 4.37 and Vietnamese requirements.

A dam holds potential for loss of life, property, and investment in the event of failure. Therefore, assurance of dam safety is of utmost importance. The REDP Dam Safety Framework makes a distinction between large and small dams as follows:

- Large dams require a review by the Dam Safety Panel (DSP) and the preparation of Dam Safety Report by the DSP; and
- Small dams do not require a review by the DSP, but require that generic dam safety measures, designed by qualified engineers, and reviewed by the technical due diligence experts contracted by the participating bank, are adequate.

A dam shall be considered large if:

- The dam height is 15 meters or greater;
- The storage is 3 million cubic meter or more;

- The dam height is between 10 and 15 meters but the dam presents special complexities (for example large flood-handling requirement, location in a zone of high seismicity, foundations that are complex and difficult to prepare, or retention of toxic materials); or
- The dam is expected to become a large dam during the operation of the facility.

Projects on International Waterways (OP/BP 7.50): The objective of this safeguard policy is to ensure that World Bank-financed projects affecting international waterways will not affect relations between the World Bank and its Borrowers and between riparian states. It applies to projects that involve the use and/or involve potential pollution of international waterways.

For biomass projects, OP 7.50 will apply if the project utilizes or discharges water from or into a river or river tributary that flows to a neighboring country or that forms a boundary with a neighboring country.

The project restructuring does not result in a change to the project activities and hence not posing a change in the overall project risks or in the original environmental categorization. However, it warrants triggering of a new safeguard policy, the policy on Project on International Waterways (OP/BP 7.50). In the design stage, it was determined that the project would not trigger OP 7.50, and the screening criteria were developed to exclude the subprojects that would trigger this policy. However in implementation process, several subprojects (Hoa Phu, Nam Hoa 1, and Nam Hoa 2 SHPPs), which would play an important role in fulfilling the project development objectives, are considered to be located on a tributary of an international waterway. Therefore, the new safeguards policy OP.750 is proposed to be triggered.

The Hoa Phu SHPP subproject (29MW) is located in Dak Lak province and is to be built on the Srepok River, a tributary of the Mekong River, an international waterway to which the World Bank's OP 7.50 applies. OP 7.50 requires that a notification of the project be made to all riparian states, in this case to Cambodia. At the request of the Government of Vietnam, the World Bank is undertaking this riparian notification to Cambodia in accordance with Paragraph 4 of OP 7.50.

Nam Hoa 1 SHPP and Nam Hoa 2 SHPPs are located on Nam Hoa stream, a tributary of Ma River, which is an international waterway that flows from Viet Nam, through Lao, and returns to Viet Nam. However, the Nam Hoa stream runs exclusively within Vietnam, and Vietnam is the lowest downstream riparian of the Ma River. The subproject investments are unlikely to cause appreciable harm to the other riparians. Therefore, these investments would fall under paragraph 7 (c) of OP 7.50, which stipulates the exception to the notification requirement regarding international waterways. The exception for the notification has been approved on May..., 2014.

3. ESF Requirements in Project Preparation and Implementation Phases

ESF requirements in each step of REDP preparation and implementation phases are summarized below and shown in Figure 3-1.

3.1. Preparation Phase

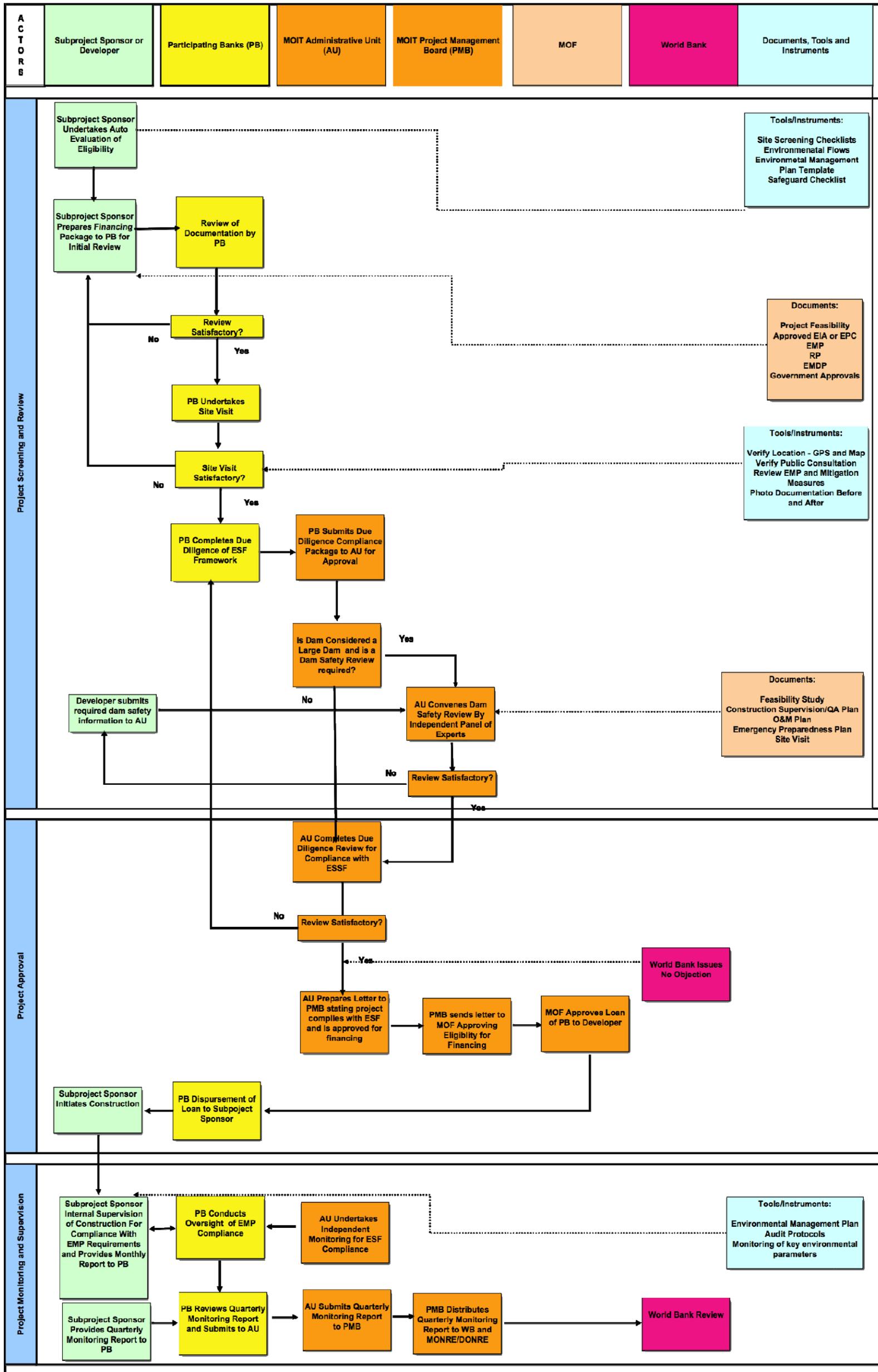
Subproject screening is the responsibility of both the developer and the PB. The objective of screening is to eliminate subprojects that are ineligible for financing under REDP because there is a high level of environmental and/or social risk or triggering of WB environmental safeguards. Subproject screening is done at the start of the development phase to ensure that the developer does not waste valuable time and resources by attempting to obtain World Bank financing for a subproject that is ineligible, or by failing to provide all the required information. If a developer is uncertain about eligibility, they may seek guidance from either the PB or PMB.

3.1.1. Pre-Screening by the Developer

The developer is responsible for preparation of a subproject information package that satisfies all ESF screening requirements. A pre-screening checklist of key issues that could affect subproject eligibility is provided in Annex 1 to assist Developers in ensuring their information package is complete and addresses key concerns, prior to submission to the PB. Developers should also review the following checklists and guidance provided in the attached annexes:

- Annex 3 is a checklist of World Bank safeguard requirements;
- Annex 4 is a description of environmental and social concerns arising from construction and operation of REDP projects.
- Annex 5 provides background information on environmental flows. Developers should consider how they can maximize environmental flows associated with subproject operation.
- Annex 7 provides mitigation and management options for REDP subprojects;
- Annex 8 includes information on what developers should do if they encounter physical cultural resources during subproject construction; and
- Annex 9 includes considerations for monitoring of REDP subprojects.

Figure 3-1: Application of ESF to the Subproject Approval Process



3.1.2. Screening by the PB

The PB is responsible for verifying the information to ensure that it is in compliance with ESF requirements. The PB should use the pre-screening checklist in Annex 2 to assess if the Developer has met all REDP submission requirements.

Screening will proceed as a two-step process, first to establish that all Vietnamese environmental assessment requirements have been satisfied, and second to verify eligibility in accordance with World Bank eligibility criteria. These procedures are described below:

Step 1 (Satisfaction of Vietnamese EA Requirements)

The PB should first establish that the subproject complies with all Vietnamese environmental regulatory requirements based upon the following material provided by the developer: (a) feasibility study (b) all the Vietnamese environmental documentation (EIA, or EPC), and (c) official approvals for the documentation from DONRE or MONRE for protection of environment, and, if required, cultural heritage (Department of Culture, Sport and Tourism), natural habitats and forests.

After the PB has established that all Vietnamese environmental policies and procedures have been successfully completed for the proposed subproject, the PB should proceed to screen the subproject to determine its' eligibility for World Bank refinancing.

Step 2 (Satisfaction of World Bank Eligibility Criteria)

There are two general criteria that would make a subproject *ineligible* for financing under the REDP as follows:

- The first would be if the subproject screening indicates that World Bank environmental safeguard procedures apply relating to natural habitats, cultural properties, or international waterways (see Annex 3).
- The second would be if certain other aspects of subproject construction or operation that, if not properly mitigated, could result in a high level of environmental risk to the lender (see Annex 4).

(i) Application of World Bank Safeguard Policies

If any of the checklist items for World Bank environmental safeguard policies (OP/BP 4.04 and OP/BP 4.11) result in a response of “Yes”, the subproject would be considered ineligible for REDP financing.

(ii) *Environmental Risks and Concerns*

Annex 4 presents a checklist of any environmental risks or concerns that will have to be addressed in the subproject environmental management plan. If *any* of the environmental criteria indicated on the checklist cannot be effectively mitigated through the environmental management plan, the subproject would be considered ineligible for REDP financing.

In summary, subprojects would only be eligible if World Bank environmental policies (natural habitats, cultural property, or international waterways) *do not* apply, or that environmental concerns can be adequately mitigated through the implementation of the subproject EMP.

3.1.3. EMP Documentation

All subprojects requiring an EIA or EPC under the national EA regulations will require that the developer prepare an Environmental Management Plan, or EMP.

It is responsibility of the developer to prepare the EMP and submit it to the PB for review. The EMP consists of a set of mitigation, monitoring and institutional measures to be taken during construction and operation in order to minimize, reduce and/or eliminate any potential adverse environmental impacts to acceptable levels. It includes the entire subproject scope and impacts. An EMP template is provided in Annex 6 and generic management and mitigation actions are presented in Annex 7.

The EMP consists of the following elements are as follows:

- Introduction
- Subproject Description and Setting
- Key Environmental and Social Issues
- Key Mitigation and Management Actions
- Supervision, Follow-up and Monitoring
- EMP Timeline and Costs
- Public Consultation and Disclosure

Annex 6 also includes some recommendations regarding EMP preparation and review.

3.1.4. Public Consultation

All subprojects require at least one public consultation and the results of the consultation require documentation in the EMP. The public consultation can be conducted either prior to preparing a draft EMP in order to discuss key environmental issues and proposed management actions to be included in the EMP, or after a draft EMP is completed to act as a basis of discussion and to elicit any additional environmental issues that may be of concern to affected groups. In either case, early consultation is preferred.

If a public consultation is being conducted to address social aspects of the subproject, EMP public consultation may be combined with it to discuss environmental and social aspects in an

integrated manner. This should reduce the time and expense in preparing for and conducting the consultation.

The developer is responsible for organizing, conducting and documenting public consultations. Public consultation should introduce the subproject to the local residents and determine if there are any particular subproject concerns. Consultations should also include representatives of local government (Commune's People Committee) and local organizations (for example Fatherland Front, Women's Union, and concerned local NGOs).

Documentation of the public consultation should include the following information:

- Manner in which notification of the public consultation was announced: media used, date(s), description or copy of the announcement;
- Date(s) consultation(s) was (were) held;
- Location(s) consultation(s) was (were) held;
- Who was invited
 - Name, Organization or Occupation, Telephone/Fax/e-mail number/address (home and/or office);
 - Who attended
 - Name, Organization or Occupation, Telephone/Fax/e-mail number/address (home and/or office);
- Meeting Program/Schedule, including what was presented and by whom;
- Summary Meeting Minutes (Comments, Questions and Response by Presenters), especially including issues raised by the local residents;
- Decisions reached and actions agreed upon to address issue raised, including schedules to implement agreed actions, deadlines, and responsibilities for the actions; and
- Any signed agreements arising as a result of consultation.

The documentation should reflect all comments, whether or not the developer agrees or disagrees. The minutes should also have signatures (name, title) of the chairman of the dialogue. The documentation should be attached to the EMP as an annex.

3.1.5. Review and Approval

The developer will include the EMP and supporting documents, including approvals by responsible Vietnamese environment authorities, as part of the information package it submits to the PB when proposing the subproject for financing. After the PB has undertaken its due diligence on the EMP, and considers that it meets the requirements set out in this Framework, it will include it in the refinancing application package to be sent to the PMB.

The PMB will verify completeness in accordance with the checklist provided in Annex 10 and prepare a memorandum to be included in the subproject file. The PMB will also obtain a no objection from the World Bank regarding the EMP.

To complete the due diligence effort on the environment aspects of the subproject, the PB will include in the subproject file a copy of the EMP and any additional documentation which may have been required as part of due diligence efforts.

Once the documentation is complete, the PMB then sends a letter to the MOF recommending that the subproject be subject to financing by the REDP. The MOF then in turn approves financing by the PB to the Developer.

3.1.6. Disclosure

The developer will be responsible for disclosing the EMP at a public location near the subproject site (for example at the Commune's People Committee Office or village gathering place) and in the offices of the Provincial DONRE and/or over the Internet³. If the subproject is located in more than one province, the EMP shall be disclosed at public locations nearest the subproject site in each province and at the local offices of DONRE.

The developer should provide a letter to the PB for the subproject files indicating: (a) where the EMP was disclosed and (b) the date(s) of disclosure. In addition, the developer should provide the PMB with English language versions of these documents. The PMB in turn should verify that the English language versions are consistent with the Vietnamese language versions and then send the documents with a transmittal letter (indicating the date, location, and manner in which the documentation was disclosed) to the World Bank Office Hanoi for disclosure.

The EMP will also be disclosed in the Vietnam Development Information Center (VDIC) in the Bank's office in Hanoi and in the InfoShop in Washington DC.

3.1.7. Related Conditions and Responsibilities

The PB will ensure that the loan agreement with the developer includes binding commitments on behalf of the developer to implement the EMP, including taking responsibility for its contractors and all subcontractors, to meet all stipulated EMP requirements. The PB shall verify that all subproject contracts contain these provisions.

3.2. EMP Responsibility During Construction and Operation

Compliance with the ESF during construction and operation will depend upon implementation of EMP requirements by the developer, supervision of EMP implementation by the developer, oversight of EMP implementation by the PB and PMB and independent monitoring of EMP performance by the IEMC and MONRE/DONRE.

It is important to clarify the following terms:

- EMP supervision is the day to day process whereby the developer supervises contractors and subcontractors to ensure that environmental commitments in the EIA/EPC and EMP provisions are complied with;

³ If the EMP is disclosed on the Internet, the developer should include a public notification (for example: in a newspaper) indicating the website where the documents may be downloaded.

- EMP oversight is the process that the PB and PMB undertakes to make sure that the developer and the PB is in compliance with EIA/EPC and EMP commitments; and
- EMP monitoring is the process undertaken by the developer and DONRE/MONRE to measure EMP performance relative to the success of mitigation measures in eliminating or reducing impacts to an acceptable level.

3.3. EMP Supervision

The developer shall be responsible for supervision of EMP performance, including those of all contractors and subcontractors. The Developer should ensure that they have dedicated resources to ensure adequate supervision of EMP performance including the following:

- Ensure that sufficient resources and capacity are dedicated to the EMP, including training of personnel if required;
- Ensure that all monitoring data is recorded and organized in a systematic and replicable manner;
- Ensure that all contractors and subcontractors comply with EMP requirements on a daily basis;
- Allow for audits and checks of EMP implementation by either the PB or PMB; and
- Provide monthly monitoring reports of EMP implementation to the PB; and
- Provide quarterly monitoring reports for submission to the PB and the PMB.

3.4. EMP Oversight

The PB will undertake oversight of EMP performance of the Developer, while the PMB will be responsible for oversight of the PB, but also maintain the right to conduct spot checks of the EMP performance of the Developer.

Role of the PB

During construction and operation, the PB will be responsible for supervision of EMP implementation. The PB may hire consultants to carry out this work on its behalf, but the consultants must be reputable and experienced in supervising and monitoring EMPs. The PBs will receive monthly compliance reports from the developer and maintain them as part of the subproject file. The PBs will also review quarterly monitoring reports submitted by the developer and forward them to the PMB.

Role of the PMB

The PMB will have an oversight role of supervision of EMP performance by the PBs and will conduct spot checks, or audits as necessary.

3.5. EMP Monitoring

EMP monitoring shall be undertaken by the Developer to ensure that the subproject is in compliance with any regulatory requirements and to assess the effectiveness of proposed mitigation measures to eliminate or reduce predicted environmental impacts to acceptable levels.

3.5.1. Objectives

The overall objectives of the EMP monitoring program are as follows:

- Ensure regulatory compliance with subproject discharge requirements to air, water or soil;
- Measure the success of the mitigation measures to minimize environmental impacts;
- Monitor the need for, and implementation of, corrective actions in the event that the proposed mitigation measure does not, or appears unlikely to, meet the stipulated level of environmental performance (as per EIA/EPC and EMP commitments); and
- Provide a mechanism for implementing new impact management and mitigation measures, or altering existing practices, based on performance data, thus facilitating continual environmental improvement.

3.5.2. Structure and Content of the Environmental Monitoring Program

The ESF is intended to only provide guidance on the content of the environmental monitoring program associated with the REDP subproject EMP. It is not intended to replace Vietnamese government requirements for monitoring associated with approval of the EIA or EPC. Rather, it is intended to monitor performance of the subproject EMP in accordance with ESF requirements.

A suggested monitoring framework is suggested in Annex 8. A comprehensive approach should be taken to developing a monitoring program including a centralized approach to data storage and retrieval. Developers should consider developing the following registers, or database records:

- Waste register
- Emissions register (discharges to air, water, soil)
- Access road register
- Water abstraction or use register (for dust control)

3.6. Reporting of EMP Performance

Developers should provide the PB with a monthly report of the results of the environmental monitoring program. The PB should review this information for any non-conformances and undertake spot checks or audits as necessary.

Developers should also provide the PB with a formal quarterly monitoring report. The PB should review this report for any non-conformances and forward a copy to the PMB. The PMB in turn will review the quarterly monitoring report for formal approval. The PMB will then distribute the report to MONRE/DONRE and the World Bank.

ANNEXES

The following annexes have been prepared to assist developers, PB and the PMB in the implementation of the REDP Environmental Safeguards Framework.

A description of each Annex follows:

- **Annex 1** is a list of issues that could affect subproject eligibility that developers should consider prior to submission of their information package to the REDP.
- **Annex 2** is the REDP Pre-screening checklist in order to assist both the developer and the PB as to whether the information package submission is complete.
- **Annex 3** is the World Bank Environmental Safeguards checklist to ensure that REDP projects are in compliance with the pertinent environmental safeguards OP 4.04 and OP/BP 4.11.
- **Annex 4** is a checklist of key environmental concerns expected for REDP projects and whether these have been addressed in the Subproject EIA or EPC or should be included in the subproject EMP.
- **Annex 5** provides some background information on environmental flows and why they should be maintained.
- **Annex 6** provides a template for the environmental management plan and some suggestions as to how it should be completed.
- **Annex 7** identifies some generic mitigation and management actions for typical impacts arising from REDP subprojects.
- **Annex 8** provides some guidelines for chance find procedures when encountering physical cultural resources.
- **Annex 9** is a template for environmental monitoring programs associated with REDP projects.
- **Annex 10** provides a final checklist for ensuring completeness in relation to the ESF.
- **Annex 11** provides key references.

ANNEX 1: SUBPROJECT SCOPING CHECKLIST

The following checklist is provided to assist developers in identifying whether their proposed subproject is eligible for REDP financing in regard to ESF Requirements and what key issues they should be concerned about.

ISSUE	RELEVANT?	OUTCOME
Is the subproject located in or near a national park or other government designated protected area?	YES <input type="checkbox"/> (tick ✓)	Ineligibility for REDP financing
If a dam, is the subproject more than 15 m in height or 3 million cubic meters in capacity?	YES <input type="checkbox"/> (tick ✓)	Dam safety review required
Will the subproject result in change of land use and resettlement of affected people?	YES <input type="checkbox"/> (tick ✓)	Land Acquisition and Resettlement plan required
Do ethnic minorities live or use the area affected by the project?	YES <input type="checkbox"/> (tick ✓)	Ethnic Minority Plan required.
Will the subproject affect physical or cultural resources that may be significant?	YES <input type="checkbox"/> (tick ✓)	Ineligibility for REDP financing
Has an EIA/EPC been completed?	YES <input type="checkbox"/> (tick ✓)	Requirement for REDP financing
Have all MONRE/DONRE Approvals been obtained?	YES <input type="checkbox"/> (tick ✓)	Requirement for REDP financing
Has public consultation of those people potentially affected by the subproject been undertaken?	YES <input type="checkbox"/> (tick ✓)	Must meet REDP consultation and disclosure requirements
Has an environmental management plan been completed?	YES <input type="checkbox"/> (tick ✓)	Requirement for REDP financing
Will the subproject affect downstream flows, ecology and those living downstream?	YES <input type="checkbox"/> (tick ✓)	Consideration of the EMP. See also Annex 5 on environmental flows
Have construction impacts been fully mitigated?	YES <input type="checkbox"/> (tick ✓)	Requirement of the EMP
Will the subproject result in construction of new access roads and how will access be managed?	YES <input type="checkbox"/> (tick ✓)	Consideration of the EMP
Will the subproject result in construction of a new transmission line?	YES <input type="checkbox"/> (tick ✓)	Consideration of the EMP

ANNEX 2: REDP PRESCREENING DOCUMENT CHECKLIST

The developer and the PB can use the following checklist to verify if the subproject information package meets the submission requirements of the REDP.

DOCUMENT	INCLUDED?
Feasibility Study	YES <input type="checkbox"/> (tick ✓)
Approved EIA (if applicable)	YES <input type="checkbox"/> (tick ✓)
Approved EPC (if applicable) Only check one	YES <input type="checkbox"/> (tick ✓)
Environmental Management Plan	YES <input type="checkbox"/> (tick ✓)
Resettlement Plan	YES <input type="checkbox"/> (tick ✓)
Ethnic Minority Plan	YES <input type="checkbox"/> (tick ✓)
MONRE/DONRE Approvals (including physical cultural resources)	YES <input type="checkbox"/> (tick ✓)
Dam safety review by Dam Safety Panel	YES <input type="checkbox"/> (tick ✓)
Other approvals: if required	YES <input type="checkbox"/> (tick ✓)

Note: In case of the Environmental Management, Resettlement, Ethnic Minority and Dam Safety Plans, developers may choose to wait to submit these documents until the PB has undertaken a preliminary screening. However developers should make themselves aware of the requirements for these documents, prior to submission for REDP financing.

ANNEX 3: WORLD BANK SAFEGUARDS CHECKLIST

The following checklists should be used to screen REDP projects in order to assess as to whether they are in violation of World Bank Safeguards.

- *If screening considers that the following Safeguard policies apply, then the REDP subproject will be considered ineligible for refinancing: OP/BP 4.04 Natural Habitats, OP/BP 4.11 Physical Cultural Resources.*
- *If screening indicates that OP/BP 4.10 Indigenous Peoples and OP/BP 4.12 Involuntary Resettlement apply, then an Ethnic Minority Plan and Resettlement Plan are required respectively.*
- *If screening indicates that OP/BP 4.37 Safety of Dams applies, then a dam safety assessment will be required.*

ENVIRONMENTAL SAFEGUARD SCREENING CRITERIA	APPLIES, YES OR NO (tick ✓)	
<p>OP/BP 4.04: Natural Habitats</p> <p><i>Natural habitats are defined as land and water areas where the ecosystems' biological communities are formed largely by native plant and animal species, and human activity has not essentially modified the area's primary ecological functions.</i></p>		
1. Is the subproject located within any National Biological Conservation Areas, (NBCAs), National/Provincial/District Protected Areas (NPAs, PPAs, DPAs)? (If yes, subproject is excluded)	YES <input type="checkbox"/>	NO <input type="checkbox"/>
2. Will the subproject result in significant degradation or conversion of habitats and/or forests in protected areas, proposed protected areas or areas that are considered of special ecological significance? If yes, what is the consequence?(If yes, subproject is excluded)	YES <input type="checkbox"/>	NO <input type="checkbox"/>
3. Will the subproject aim to bring about changes to the management, protection, or utilization of natural forests or plantations, whether they are publicly, privately, or communally owned?(If yes, subproject is excluded)	YES <input type="checkbox"/>	NO <input type="checkbox"/>
4. In the case of a biomass subproject, will the subproject undertake commercial harvesting of forests (e.g., for fuel for biomass plant)? (If yes, subproject is excluded)	YES <input type="checkbox"/>	NO <input type="checkbox"/>
5. Is the subproject located within the buffer zone of any National Biological Conservation Areas, (NBCAs), National/Provincial/District Protected Areas (NPAs, PPAs, DPAs)? (if yes, subproject is eligible but requires permit)	YES <input type="checkbox"/>	NO <input type="checkbox"/>

ENVIRONMENTAL SAFEGUARD SCREENING CRITERIA	APPLIES, YES OR NO (tick ✓)	
6. Will the subproject flood a forested area? (if yes, subproject is eligible but requires permit).	YES <input type="checkbox"/>	NO <input type="checkbox"/>
If the answer to any of Questions 1-4 is YES, OP/BP 4.04 will apply and the subproject is NOT ELIGIBLE for refinancing.		

ENVIRONMENTAL SAFEGUARD SCREENING CRITERIA	APPLIES, YES OR NO (tick ✓)	
OP/BP 4.10: Ethnic Minorities (Indigenous Peoples) <i>The World Bank policy on indigenous peoples, underscores the need that subproject developers identify indigenous peoples, consult with them, ensure that they participate in, and benefit from Bank-funded operations in a culturally appropriate way - and that adverse impacts on them are avoided, or where not feasible, minimized or mitigated. In case of Vietnam and the REDP, this policy has been modified to consider ethnic minorities, rather than indigenous peoples.</i> <i>If ethnic minorities are to be affected by an REDP subproject and Ethnic Minority Plan must be prepared</i>		
Are ethnic minority people present/reside in the project area?	YES <input type="checkbox"/>	NO <input type="checkbox"/>
If the answer is YES, OP/BP 4.10 Apply and an Ethnic Minority Plan in accordance with Ethnic Minority Planning Framework is required.		

ENVIRONMENTAL SAFEGUARD SCREENING CRITERIA	APPLIES, YES OR NO (tick ✓)	
OP/BP 4.11: Physical Cultural Resources		
<i>Physical cultural resources include movable or immovable objects, sites, structures, groups of structures, natural features and landscapes that have archeological, paleontological, historical, architectural, religious, aesthetic or other cultural significance.</i>		
1. Will the subproject cause temporary or permanent relocation or any other type of impact on physical cultural resources known to be of local, regional or national significance based on national or Provincial lists, proposed national or Provincial lists and/or identified during public consultation with local affected groups.	YES <input type="checkbox"/>	NO <input type="checkbox"/>
2. Are any physical cultural resources considered especially important or sensitive particularly to local groups (e.g. gravesites)	YES <input type="checkbox"/>	NO <input type="checkbox"/>
3. Are chance find procedures in place?	YES <input type="checkbox"/>	NO <input type="checkbox"/>
If the answers to Question 1 and 2 is YES, OP/BP 4.11 Apply and the subproject is NOT ELIGIBLE for refinancing		

ENVIRONMENTAL SAFEGUARD SCREENING CRITERIA	APPLIES, YES OR NO (tick ✓)	
OP/BP 4.12 Involuntary Resettlement		
<i>The Involuntary Resettlement safeguard will apply in those situations involving involuntary taking of land and involuntary restrictions of access to legally designated parks and protected areas. The policy aims to avoid involuntary resettlement to the extent feasible, or to minimize and mitigate its adverse social and economic impacts.</i>		
1. Is any land used by people/organizations likely to be acquired as a result of the subproject?	YES <input type="checkbox"/>	NO <input type="checkbox"/>
2. Will any subproject activity involve restrictions of use on adjoining land?	YES <input type="checkbox"/>	NO <input type="checkbox"/>
3. Is land ownership affected by the subproject?	YES <input type="checkbox"/>	NO <input type="checkbox"/>
4. Will there be a loss of housing or assets or incomes of local people/organizations?	YES <input type="checkbox"/>	NO <input type="checkbox"/>
5. Will any social or economic activities be affected by land use related changes?	YES <input type="checkbox"/>	NO <input type="checkbox"/>
If the answer to any of the above questions is YES, OP/BP 4.12 Apply and a Resettlement Plan in accordance with Resettlement Policy Framework is required.		

ENVIRONMENTAL SAFEGUARD SCREENING CRITERIA	APPLIES, YES OR NO (tick ✓)	
<p>OP/BP 4.37 Safety on Dams</p> <p><i>The Safety on Dams Safeguard requires that experienced and competent professionals design and supervise construction, and that the borrower adopts and implements dam safety measures through the project cycle. The policy also applies to existing dams where they influence the performance of a project. In this case, a dam safety assessment should be carried out and necessary additional dam safety measures implemented.</i></p> <p><i>This policy will apply if an REDP subproject is to be considered a large dam according to the criteria below and therefore will require that a Dam Safety Assessment be completed.</i></p>		
1. Is the dam height is 15 meters or greater?	YES <input type="checkbox"/>	NO <input type="checkbox"/>
2. Is dam storage 3 million cubic meter or more?	YES <input type="checkbox"/>	NO <input type="checkbox"/>
3. The dam height is between 10 and 15 meters but the dam presents special complexities (for example large flood-handling requirement, location in a zone of high seismicity, foundations that are complex and difficult to prepare, or retention of toxic materials?)	YES <input type="checkbox"/>	NO <input type="checkbox"/>
Is the dam is expected to become a large dam during the operation of the facility?	YES <input type="checkbox"/>	NO <input type="checkbox"/>
<p>If the answer to any of the above questions is YES, the dam is considered to be a large dam and a Dam Safety Assessment will be required. The Dam Safety Assessment will be based on the Dam Safety Framework.</p>		

Note to Developer: A final decision as to the application of the policy will be made by the World Bank.

Overall Safeguard Compliance	YES <input type="checkbox"/> (tick ✓)
	NO <input type="checkbox"/> (tick ✓)

ANNEX 4: ENVIRONMENTAL CONCERNS AND EMP REQUIREMENTS

Issue or Environmental Concern (Note: Social issues and concerns are dealt elsewhere in Resettlement and Ethnic Minority Frameworks included in the Operational Manual)	Is Issue or Concern Addressed in EIA or EPC? Yes or No (tick ✓)		Is Issue or Concern Addressed in EMP? Yes or No (tick ✓)		Required Action or Follow-up
	YES	NO	YES	NO	
Air quality impacts on local communities?					
Noise?					
Dust?					
Is in a Seismically Active or Geotechnically Unstable Area?					
Affects Integrity of Protected Areas?					
Impacts on Migratory, Rare, Threatened or Endangered Species?					
Impacts on Biodiversity?					
Considers Downstream Impacts?					
Affect Environmental Flows? See also Annex 5 about environmental flows and why it is important they be maintained.					

Issue or Environmental Concern (Note: Social issues and concerns are dealt elsewhere in Resettlement and Ethnic Minority Frameworks included in the Operational Manual)	Is Issue or Concern Addressed in EIA or EPC? Yes or No (tick ✓)		Is Issue or Concern Addressed in EMP? Yes or No (tick ✓)		Required Action or Follow-up
	YES	NO	YES	NO	
Affect Downstream Water Quality?					
Affects Fish or Fisheries?					
Considers Off-site Impacts (e.g. Borrow Pits and Aggregates)?					
Aesthetic and Visual Impacts?					
Impacts Cultural Property or Resources?					
Causes Increased Erosion and Sedimentation During Construction?					
Involves Construction of New Access Roads?					
Involves Construction of Worker Camp(s)?					
Has Chance Find Procedures In Place for Physical and Cultural Resources?					
Has Waste Management Plan (Solid and Liquid Wastes) in Place?					

Issue or Environmental Concern (Note: Social issues and concerns are dealt elsewhere in Resettlement and Ethnic Minority Frameworks included in the Operational Manual)	Is Issue or Concern Addressed in EIA or EPC? Yes or No (tick ✓)		Is Issue or Concern Addressed in EMP? Yes or No (tick ✓)		Required Action or Follow-up
	YES	NO	YES	NO	
Is there a Reclamation Plan In Place?					
Has Subproject Contingency and Notification Plan in case of Accident or Event (e.g Release)?					
Has Included EMP and Environmental Protection Measures as Part of Contract Provisions?					
Has EMP Monitoring and Supervision Procedures in Place?					
Includes Costs and Timeline for EMP?					
Are there any other issues of concern about the subproject that is listed in the EIA or EPC over and above the aforementioned issues that should be addressed?					

ANNEX 5: ENVIRONMENTAL FLOWS

How do dams affect ecosystems?: There are three levels of impact caused by dams a) first-order impacts that involve the physical, chemical, and geomorphological consequences of blocking a river and altering the natural distribution and timing of streamflow; b) second-order impacts that involve changes in primary biological productivity of ecosystems including effects on riverine and riparian plant-life and on downstream habitat such as wetlands; c) third-order impacts that involve alterations to fauna (such as fish) caused by a first-order or second order effects. Storage dams, particularly hydropower peaking plants, can significantly disrupt the whole flow regime, resulting in both high seasonal and day-to-day fluctuations that differ greatly from natural flow levels. Efforts to minimise the impacts of changes in flow regime have relied on measures to restore the streamflow regime through establishing environmental flow releases.

What are environmental flows?: Environmental flows are defined as the water regime provided within a river, wetland or coastal zone to maintain ecosystems and the benefits of ecological goods and services they provide, where there are competing water uses and where flows are regulated. The goal of environmental flows is to provide a flow regime that is adequate in terms of quantity, quality and timing for sustaining the health of the rivers and other aquatic ecosystems. Environmental flows are a relatively new concept, little more than two decades old (from IUCN, 2008).

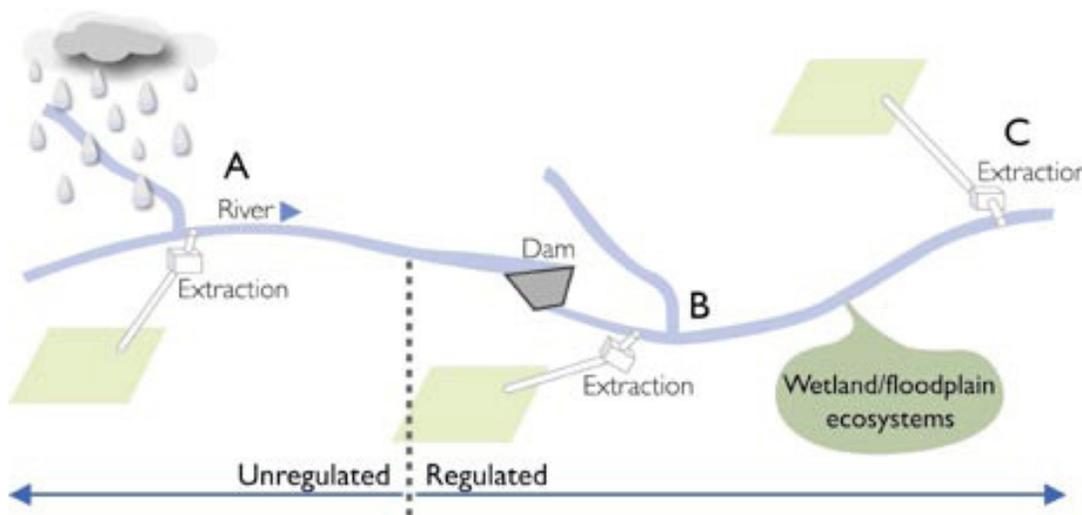


Figure 1: Environmental flows in rivers showing unregulated and regulated sections (from Land and Water Australia, 2007)

How to determine environmental flows?: *There is no one best method, approach or framework to determine environmental flows - no simple figure that can be given for the environmental flow requirements of rivers and associated wetlands. Much depends on the desired future character of the river ecosystem under consideration.*

All elements of a flow regime will influence the ecology of a river in some way, so that if a totally natural ecosystem is desired, the flow regime will need to be natural. However, most river ecosystems are managed to a lesser or greater extent and it is accepted that removal of water from the river for human uses, such as public supply, power generation, irrigation and industrial processing, is necessary for human survival and development. The environmental flow allocated to a river is thus primarily a matter of social choice, with science providing scenarios of what it will be like under various flow regimes. The desired condition of the river may be set by legislation, or may be a negotiated trade-off between water users. (IUCN 2008).

Methods – Four general methods have been defined for determining environmental flows:

1. Look-up tables - the most commonly applied methods to define target river flows are rules of thumb based on simple indices given in look-up tables. The most widely employed indices are purely hydrological, but ecological data is also used. The Q95 index is often used, that flow is equaled or exceeded for 95% of the time.
2. Desktop analysis – use hydrological or ecological data to determine flows. A fundamental principle is to maintain integrity, natural seasonality and variability of flows, including floods and low flows.
3. Functional analysis – use models to examine the functional relationships between hydrological and ecological conditions
4. Habitat modeling – mathematical models are developed to determine flows using data on habitat for target species to determine ecological flow requirements.

Environmental flows can be realized with modifications to new and existing dams: Dams are often the most significant and direct modifiers of natural river flows. They are an important starting point to implement environmental flows. Downstream releases from dams are determined by the design to pass water through, over or around the dam. The operating policies and rules determine the amount and timing of releases for environmental flows.

Where to start? Consider the entire river in its context: This means looking at the basin from its headwaters to the estuarine and coastal environments and including its wetlands, floodplains and associated groundwater systems. It also means considering environmental, economic, social and cultural values in relation to the entire system. It means identifying all uses of the river for human benefit. A wide range of outcomes, from environmental protection to serving the needs of industries and people, are to be considered when establishing a value for environmental flows.

A compromise approach is needed to achieve environmental flows: At least 29 countries currently seek to minimize the impacts of dams by using environmental flow requirements (WCD 2000). The countries that use this method recognize that a short-term reduction in financial returns from a project often leads to improved long-term sustainability and attainment of broader societal objectives and providing for a healthier environment. Decisions on dams should value ecosystems, social and health issues equally as an integral part of the project and river basin development and prioritize the avoidance of impacts in consideration with a precautionary approach.

Considerations in establishing environmental flows: In setting environmental flows, a range of approaches should be used combining ecological, social, economic, political and legal points of view. The process will not be easy and will require dialogue and participation of multiple parties and interests. The following aspects should be taken into account:

- Understanding the river throughout its entire length and drainage, including ecological, cultural, social and economic values;
- Setting objectives and clear scenarios for use and allocation;
- Undertake an analysis of costs and benefits for environmental flows and incentives for their implementation – financing environmental flows hinges on the acceptance of changes in the status quo;
- Consider alternatives for incentives outside of the normal framework for economical analysis and return;
- Develop a effective domestic policy and legal framework for environmental flows, while considering international commitments;
- Generate political momentum involving a range of actors and interests, considering no single and simple approach will work for all; and
- Build capacity for design and implementation.

ANNEX 6: ENVIRONMENTAL MANAGEMENT PLAN TEMPLATE

The following is a suggested template that subproject developers can use to develop an environmental management plan.

1. Introduction (Recommended 1-2 pages)

- a. Subproject Background
- b. Subproject developer
- c. Objectives
- d. Responsibility for Plan Preparation

2. Subproject Description and Setting (Recommended 3-5 pages)

Provide a brief summary of the subproject and its setting, including a map showing local and regional characteristics. This information should be available in the Government of Vietnam approved EIA or EPC.

- a. Subproject Map – a map of the subproject area and its regional context should be provided showing subproject components the affected subproject area.
- b. Subproject Summary – only key project details should be included such as the amount of power generated, height of the dam(if applicable), size and depth of the reservoir, access roads, camps, etc.
- c. Environmental Setting - The environmental setting should describe major natural terrestrial and aquatic features, areas of cultural significance, location of nearby parks and/or natural protected areas.
- d. Social Setting - The social setting should describe characteristics of any settlements or communities in the vicinity of the subproject, general land use characteristics (farming, small industry etc. and the nearest population centers). The location(s) of any other energy development projects either operating, under construction, or planned should also be indicated.

3. Key Environmental and Social Issues (Recommended 3-5 pages)

Using the subproject EIA/EPC, a summary of key environmental and social impacts arising from each subproject phase (construction and operation) should be provided. The list of impacts will be used to describe specific environmental mitigation and management actions to reduce and/or eliminate subproject impacts.

- a. Key Environmental Issues
- b. Key Social Issues

4. Key Mitigation and Management Actions

The EMP should describe mitigation and/or management actions that subproject developers will implement to reduce and/or eliminate subproject impacts to an acceptable level as determined by Vietnamese regulatory authorities and to ensure compliance with World Bank Safeguards. These mitigation and management actions will form part of loan agreement conditions.

While it recognized that the extent and magnitude of these mitigation and management actions will vary with subproject typology, a generic mitigation and management action template is provided in Annex 7.

The mitigation plan:

- a. Identifies and summarizes all adverse environmental impacts.
- b. Describes, with technical details each mitigation action for each type of impact.
- c. Estimates environmental impacts of mitigation.
- d. Provides linkages to other plans.

5. Supervision, Follow-up and Monitoring

The EMP describes measures for supervision of contractors and subcontractors to ensure that the subproject is being constructed in compliance with environmental and social commitments and suggested mitigation measures. Specifically supervision describes the following:

- a. Structure and function of the environmental supervision unit
- b. Types of data that will be collected to measure EMP compliance
- c. Types of action taken in the event of non-compliance
- d. Reporting mechanisms

Environmental monitoring during subproject implementation provides information about key environmental aspects of the subproject, particularly environmental impacts and the effectiveness of mitigation measures. The EMP provides information about key environmental aspects of the subproject, particularly the environmental impacts of the subproject and the effectiveness of mitigation measures. The EMP identifies monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed in the EA report and the mitigation measures described in the EMP. Specifically, the monitoring section of the EMP provides the following:

- a. Specific description and technical details of monitoring measures to be implemented including parameters to be measures, methods, sampling locations, frequency, analyses, and definition of thresholds for corrective action.
- b. Monitoring and reporting procedures.

6. EMP Timeline and Costs

The EMP should provide an implementation schedules and capital and recurrent costs of implementation.

7. Public Consultation and Disclosure

All subprojects require at least one public consultation and the results of the consultation documented in the EMP. The public consultation can be conducted either prior to preparing a draft EMP in order to establish key environmental issues to be included in the EMP, or after a draft EMP is completed to act as a basis of discussion and to elicit any additional environmental issues that may be of concern to affected groups.

8. Suggestions for EMP Preparation and Review

Developer

The focus of the EMP is to describe, in a clear and concise manner, how mitigation and management actions will be implemented to reduce subproject impacts to acceptable levels; it is not intended to replicate the subproject EIA or EPC, although this information shall form the basis of the EMP.

- The subproject description should only summarize those design aspects that could result in an environmental impact requiring a mitigation or management action; it is not necessary to describe the subproject in detail and provide unnecessary textual description, tables or drawings;
- The EMP should include a map that clearly indicates the area affected by the subproject and also a regional context to allow for easy location;
- The EMP should only summarize the environmental and social setting of the subproject;
- The EMP should only summarize key issues or impacts of the EIA/EPC; it is not necessary to repeat them in detail;
- The EMP should provide clear and detailed mitigation or management commitments on behalf of the developer for each and every key impact of concern, including responsibility and timeline for implementation;
- The EMP should include a detailed description of costs as these will form part of subproject financing.
- The developer should ensure that adequate public consultation is completed.

PB

- The PB should review the EMP and ensure that all key subproject impacts have a specific management or mitigation action to reduce the impact to an acceptable level;
- Costs of the EMP should be tallied and included as part of subproject financing costs;
- Mitigation and management commitments should be compiled and included as part of contractual requirements in the subproject loan agreement; and

- The PB should verify that adequate consultation has been completed and that there are no outstanding issues on behalf of subproject stakeholders, local organizations or government regulators.

References:

World Bank. 1999. OP 4.01 Environmental Assessment. Annex C – Environmental Management Plan. World Bank, Washington. D.C.

ANNEX 7: GENERIC MITIGATION AND MANAGEMENT OPTIONS FOR REDP PROJECTS

The following mitigation measures are suggested for inclusion into the environmental management plan for REDP projects. Their implementation should consider the regulatory requirements specified by the project EIA or EPC. These measures are recommended as best environmental guidelines or practices. While responsibilities have been indicated in both phases, the Developer is fully responsible for EMP implementation, including contractor performance.

HYDROELECTRIC PROJECTS

Construction Phase

Issue	Responsibility	Mitigation or Management Measure
Siting of REDP Facility and associated infrastructure	Developer	Construction of the REDP facility and any associated infrastructure shall be sited as follows: <ul style="list-style-type: none"> • Avoid forested areas • Be located at least 1 km from National Biological Conservation Areas, (NBCAs), National/Provincial/District Protected Areas (NPAS, PPAs, DPAs)
Construction inert waste management (excess rock and spoil – soil material)	Contractor	<ul style="list-style-type: none"> • Rock shall be used as fill to the greatest extent possible, excess material shall be disposed at a disposal site approved by regulatory authorities. • A reinstatement and revegetation plan should be implemented so that the area is fully reclaimed to a productive land use.
Vegetation removal of the reservoir and construction site	Contractor	<ul style="list-style-type: none"> • Vegetation debris from clearing operations shall be stacked outside cleared areas. • Burning shall be limited and must follow Vietnam Decrees and regulations

Issue	Responsibility	Mitigation or Management Measure
		<p>for prevention of forest fire such as Decree Number 22/CP 9/3/1995 and Decree number 09/2006/ND-CP dated 16/01/2006.</p> <ul style="list-style-type: none"> • Wherever possible and where safety is assured, villagers will be permitted to remove for their personal use at no charge, vegetation such as bamboo and small trees, that have an economic or practical value
Loss of forest	Developer and Contractor	<ul style="list-style-type: none"> • Avoid siting subproject in forested areas, to the extent possible. Any trees removed as a result of construction must be reestablished after construction or compensated for at some other location.
Topsoil stripping and salvage	Contractor	<ul style="list-style-type: none"> • Topsoil and associated organic material will be stored and covered to prevent erosion. • After construction completion, soil will be restored to original location and revegetated.
Erosion and sedimentation	Contractor	<ul style="list-style-type: none"> • Wherever possible disturbance to ground areas shall be minimized and stabilized as quickly as possible. Drainage shall be controlled and redirected to avoid disturbed areas. • Bunds, sedimentation ponds, or other silt trapping devices, such as silt fences, straw bales, rock berms and other materials, shall be constructed to avoid siltation into surface waters. • Construction will occur under dry conditions. • Any transmission towers or other structures will be located to avoid steep slope (>30°) areas. • In case selection of such slope areas cannot be avoided, structures will be

Issue	Responsibility	Mitigation or Management Measure
		designed to minimize excavation on slopes.
Concrete production		<ul style="list-style-type: none"> • There should be no discharge of concrete batching water to any water course or drainage. • Under no circumstances shall waste concrete materials be dumped to soils or water courses.
Construction engine equipment exhausts	Contractor	<ul style="list-style-type: none"> • Ensure that all construction equipment has valid Vietnamese registration and is in good operating condition. • Minimize engine idling by turning off equipment not in use for more than 5 minutes.
Fuel storage and handling	Contractor	<ul style="list-style-type: none"> • Fuel storage and transport should follow national or sectoral regulations such as TCVN 5684 - 2003 – Fire prevention for fuel projects- General requirements and TCVN 2622 – 1995 – Fire prevention for housing and projects - Design requirements. • Best practice for fuel storage areas is to locate them at least 100 meters away from any surface water bodies, avoid villages and any population centers. • Place equipment on an impervious surface (preferable a synthetic liner) to prevent leaks from contaminating soil and groundwater. • Ensure that all fuel storage areas are properly banded (bermed or contained) to contain 110% of the stored volume in the event of a spill.

Issue	Responsibility	Mitigation or Management Measure
		<ul style="list-style-type: none"> • Refueling should only be done in designated refueling areas. • Ensure that spill equipment is in place and that all operators are properly trained in emergency response measures in the event of a spill.
Management of hazardous materials (fuels, lubricants, explosives etc.)	Contractor	<ul style="list-style-type: none"> • All hazardous materials shall be stored on impervious surfaces (preferably a synthetic liner), in well ventilated buildings that are locked and fenced when not in use. • Hazardous material storage and transport should follow national or sectoral regulations. Best practice is to locate storage areas at least 100 m from surface water bodies. • Workers shall be informed of the requirements for protective equipment for handling hazardous materials and MSDS (Material Safety Data Sheets) shall be provided.
Vehicle maintenance	Contractor	<ul style="list-style-type: none"> • Construction shall take place only during daytime hours (from 7.00AM to 6.00PM). • If noise level is exceeds 70db in residential areas during the daytime (except during blasting), measures such as installing acoustic barriers or other protection measures will be taken. • If construction during evening is required, the local affected people will be consulted at least one week in advance. • Vehicle maintenance shall only take place in designated maintenance areas. • There shall be no washing of equipment or vehicles in watercourses.

Issue	Responsibility	Mitigation or Management Measure
		<ul style="list-style-type: none"> All waste oils and lubricants shall be collected and recycled wherever possible. There should be no discharge or release of fuels, oils or lubricants to soil and water.
Noise and vibration	Contractor	<ul style="list-style-type: none"> Construction shall take place only during daytime hours (from 7.00AM to 6.00PM). If noise level is exceeds 70db in residential areas during the daytime (except during blasting), measures such as installing acoustic barriers or other protection measures will be taken. If construction during evening is required, the local affected people will be consulted at least one week in advance.
Dust	Contractor	<ul style="list-style-type: none"> Dust control measures shall be implemented on all unpaved roads and construction surfaces, in dry and windy conditions. Locations of water withdrawals for dust control shall be from approved locations and volumes of water withdrawn will be recorded.
Location of construction camps	Contractor	<ul style="list-style-type: none"> Where possible, the construction camp shall be located in areas of existing land disturbance, rather than an undeveloped area. Camps should be sited away from existing communities wherever possible.
Existing roads	Contractor	<ul style="list-style-type: none"> Minimize additional traffic movements on existing roads. Repair any roads as soon as damage becomes evident. Roads shall be kept free from mud, debris and other obstacles.

Issue	Responsibility	Mitigation or Management Measure
Access road siting and construction	Contractor	<ul style="list-style-type: none"> • • Wherever possible, access roads shall be minimized and be located in areas of existing roads or disturbance. • An access road register, or list, shall be maintained, documenting which access roads were constructed by the subproject and restored after construction is completed. • Minimal impact construction measures such as minimizing ROW width, installing erosion control measures and avoiding environmental sensitive areas, shall be implemented. • Avoid tree cutting or economically productive lands wherever possible.
Transmission line siting and construction	Contractor and Developer	<ul style="list-style-type: none"> • Wherever possible, transmission lines should be located in areas of existing disturbance or rights-of-way. • Avoid environmentally sensitive areas such as wetlands, migratory or local bird routes, and protected areas. • Minimize construction of access roads, wherever possible. • Access to the transmission line should be minimized after construction and all unnecessary access roads should be removed. • Minimal impact construction measures such as minimizing ROW width, installing erosion control measures and avoiding environmental sensitive areas, shall be implemented. • Avoid tree cutting or economically productive lands wherever possible.

Issue	Responsibility	Mitigation or Management Measure
		<ul style="list-style-type: none"> Vegetation management of transmission lines should be done manually or machinery. Use of herbicides for vegetation control is not permitted.
Worker Camp Management	Contractor	<ul style="list-style-type: none"> Adequate sanitary or lavatory facilities (toilets and washing areas) should be provided for the expected number of workers. Toilet facilities should also be provided with adequate supplies of hot and cold running water, soap, and hand drying devices. Waste water treatment plants shall be installed at all camp locations for treatment of waste water from kitchens, wash facilities and toilets. All waste water discharges shall comply with Vietnamese or World Bank Group standards. The contractor shall develop a procedure and system for storing and disposing of all solid wastes generated by the labor camp and/or base camp. The contractor shall not use fuel wood as a means of heating during the processing or preparation of any materials forming part of the Works. Food and camp provisions shall be secured so as to not impact food supplies and provisions of local communities.
Camp water supply	Contractor	<ul style="list-style-type: none"> Camp water supplies shall be derived from locations approved by regulatory authorities. Camp water supplies should not impact water withdrawal by local populations.
Sewage and grey water	Contractor	<ul style="list-style-type: none"> If practical, connection to the existing public sewage system should be

Issue	Responsibility	Mitigation or Management Measure
		made, otherwise a properly designed and sited sewage and grey water treatment facility shall be implemented.
Solid waste management	Contractor	<ul style="list-style-type: none"> • A waste management register, or tracking system, shall be implemented to track volumes of waste generated by the subproject and their point of disposal. • Waste segregation measures shall be undertaken to maximize recycling and minimize the amount of solid waste for disposal. • Arrangements for regular removal of domestic waste by municipal authorities should be made. If this is not possible, waste should be taken to an approved waste disposal site on a regular basis. • Between removal periods, the temporary disposal site should be covered and protected from animals. •
Transmission line routing and construction	Contractor	<ul style="list-style-type: none"> • Use existing ROWs wherever possible. • Minimize construction of access roads, wherever possible. • Avoid environmentally sensitive areas such as wetlands, migratory or local bird routes, and protected areas.
Chance find of cultural artifacts, and areas/structures of local cultural value	Contractor	<ul style="list-style-type: none"> • In case any historical, cultural or archeological resources that may be encountered during excavation, chance find procedures shall be implemented as per Annex 8, excavation works shall be stopped and the Provincial/Municipal Directors of Culture and Information Services shall be immediately informed.

Issue	Responsibility	Mitigation or Management Measure
		<ul style="list-style-type: none"> • No persons shall be permitted to remove any historical, cultural or archaeological resources; such action are grounds for dismissal or contract cancellation. • Construction work will only be resumed after inspection and written approval to proceed by regulatory authorities. • In case any transmission line or access road or structure passes through, or is to be sited on, village cemeteries, the alignment or site shall be changed. If it is unavoidable, a special consultation with the affected communities would be held to determine culturally appropriate means of relocating the gravesites in accordance to local customs/beliefs/traditions. • No transmission tower pads are to be placed in cemeteries.
<p>Construction material supply (aggregate, concrete etc.) and use of borrow pits and other sources of material</p>	<p>Contractor</p>	<ul style="list-style-type: none"> • All construction materials supplied to the subproject, e.g. stone, concrete, sand, etc. must be provided by contractors with valid operating permits and necessary environmental approvals. • Rock or gravel taken from a river shall be far enough removed to limit the depth of material removed to one-tenth of the width of the river at any one location, and not to disrupt river flow, or damage or undermine river banks. • Crushing plants shall be located in approved areas and avoid environmentally sensitive areas or communities. All equipment shall be fitted with dust control devices. • Borrow pits should be located away from critical areas such as steep slopes, erosion-prone soils, and areas that drain directly into sensitive water bodies.

Issue	Responsibility	Mitigation or Management Measure
		<ul style="list-style-type: none"> • Extraction of material shall be limited to approved and demarcated borrow pits. • Existing drainage channels in areas affected by the operation should be kept free of overburden. • All borrow pits shall be properly reinstated and revegetated at the close of operations.
Protection of flora and fauna	Contractor	<ul style="list-style-type: none"> • Workers will not be allowed to remove plants, trap or hunt animals, or fish; such actions will be cause for dismissal. • Workers will not be allowed to have firearms in camps.
Worker Camp Management	Contractor	<ul style="list-style-type: none"> • Contractors will be required to develop a health and safety plan two weeks before starting construction work for review and approval by the subproject developer. • Workers will be subjected to health screening and health and safety training sessions will be provided; public health education will be part of the construction program. • Necessary safety tools such as helmets, working shoes, ear protection, dust filter and other personal protective equipment will be provided and be required to be used by workers. Adequate sanitary or lavatory facilities (toilets and washing areas) should be provided for the expected number of workers. Toilet facilities should also be provided with adequate supplies of hot and cold running water, soap, and hand drying devices. • Waste water treatment plants shall be installed at all camp locations for

Issue	Responsibility	Mitigation or Management Measure
		<p>treatment of waste water from kitchens, wash facilities and toilets. All waste water discharges shall comply with Vietnamese or World Bank Group standards.</p> <ul style="list-style-type: none"> • The contractor shall develop a procedure and system for storing and disposing of all solid wastes generated by the labor camp and/or base camp. • The contractor shall not use fuel wood as a means of heating during the processing or preparation of any materials forming part of the Works. • Food and camp provisions shall be secured so as to not impact food supplies and provisions of local communities.
Worker health and safety	Developer and contractor	<ul style="list-style-type: none"> • Contractors will be required to develop a health and safety plan two weeks before starting construction work for review and approval by the subproject developer. • Workers will be subjected to health screening and health and safety training sessions will be provided; public health education will be part of the construction program. • Necessary safety tools such as helmets, working shoes, ear protection, dust filter and other personal protective equipment will be provided and be required to be used by workers. • Workers will be provided with access to Material Safety Data Sheets for chemicals and hazardous materials on site. Training in their appropriate use shall be provided. • Access routes in camp locations shall be clearly marked.

Issue	Responsibility	Mitigation or Management Measure
		<ul style="list-style-type: none">• An evacuation plan shall be developed and procedures put in place to inform workers of what to do in case of a fire, accident or emergency situation that requires evacuation.
Worker Code of Conduct	Developer and contractor	<ul style="list-style-type: none">• Contractors will be required to develop a worker code of conduct policy and program, stipulating requirements of workers to comply with subproject environmental and social commitments.
Community Safety	Developer and contractor	<ul style="list-style-type: none">• Contractors will be required to develop a community safety plan two weeks before starting construction work for review and approval by the subproject developer.• The community safety plan should inform local residents of equipment movement and operation.

Operation Phase

Note: Some of the generic mitigation or management measures may not be applicable within the current Vietnamese regulatory framework. They are included as considerations of best environmental practice for small hydro projects.

Issue	Responsibility	Mitigation or Management Measure
Noise (from power house)	Developer	<ul style="list-style-type: none"> • Turbines and/or associated rotating equipment should be designed to meet international standards (~80 db @ 1 meter). • As necessary, equipment should be housed in sound insulated buildings, and/or trees shrubs planted around noisy equipment to further absorb sound.
Downriver hydrological changes including modification to natural flows	Developer	<ul style="list-style-type: none"> • Downstream impacts can be reduced through maintenance of environmental flows and optimizing water releases (see Annex 5: Environmental flows). Objectives to be considered in optimizing water releases from turbines and spillways include adequate environmental flows for riparian ecosystems, reservoir and downriver fish survival, reservoir and downriver water quality, aquatic weed and disease vector (e.g. mosquito) control, irrigation and other human uses of water, downriver flood protection, recreation and power generation. • From an ecological standpoint, the ideal water release pattern would usually closely mimic the natural flooding regime.

Issue	Responsibility	Mitigation or Management Measure
Impairment of water quality	Developer	<ul style="list-style-type: none"> • Water pollution control measures (such as sewage treatment plants or enforcement of industrial regulations) may be needed to improve reservoir water quality. • Where poor water quality would result from the decay of flooded biomass, selective forest clearing within the impoundment area should be completed before reservoir filling.
Impacts on fish and aquatic biota	Developer	<ul style="list-style-type: none"> • Fish Management Measures. Management of water releases (see above) may be needed for the survival of certain fish species, in and below the reservoir. • Fish passage facilities (fish ladders, elevators, or trap-and-truck stations) are intended to help migratory fish move upriver past a dam. • Fish hatcheries can be useful for maintaining populations of native species that can survive but not successfully reproduce within the reservoir.
Floating Aquatic Vegetation.	Developer	<ul style="list-style-type: none"> • Pollution control and pre-impoundment selective forest clearing will make reservoir conditions less conducive to aquatic weed proliferation. Physical removal of floating aquatic weeds is effective, though expensive. • Chemical poisoning of weeds or related insect pests is to be avoided.
Greenhouse Gases	Developer	<ul style="list-style-type: none"> • None, other than choosing reservoir sites that minimizes the flooding of large areas of land.

Issue	Responsibility	Mitigation or Management Measure
Reservoir Sedimentation	Developer	<ul style="list-style-type: none"> • Watershed Management. To minimize reservoir sedimentation rates, it may be useful to work together with the Forest Protection Agency to control road construction, mining, agriculture, and other human activities in the watershed. Protected areas can be established in upper watersheds to reduce sediment flows into reservoirs. •
Protection of flora and fauna	Contractor	<ul style="list-style-type: none"> • Workers will not be allowed to remove plants, trap or hunt animals, or fish; such actions will be cause for dismissal. • Workers will not be allowed to have firearms in camps.
Worker health and safety	Developer and contractor	<ul style="list-style-type: none"> • Contractors will be required to develop a health and safety plan two weeks before starting construction work for review and approval by the subproject developer. • Workers will be subjected to health screening and health and safety training sessions will be provided; public health education will be part of the construction program. • Necessary safety tools such as helmets, working shoes, ear protection, dust filter and other personal protective equipment will be provided and be required to be used by workers.
Worker Code of Conduct	Developer and contractor	<ul style="list-style-type: none"> • Contractors will be required to develop a worker code of conduct policy and program, stipulating requirements of workers to comply with project environmental and social commitments.

Issue	Responsibility	Mitigation or Management Measure
Fuel storage and handling	Contractor	<ul style="list-style-type: none"> • Fuel storage and transport should follow national or sectoral regulations and valid regulations such as TCVN 5684 - 2003 – Fire prevention for fuel projects- General requirements and TCVN 2622 – 1995 – Fire prevention for housing and projects - Design requirements. • Best practice for fuel storage areas is to locate them at least 100 meters away from any surface water bodies, avoid villages and any population centers. • Place equipment on an impervious surface (preferable a synthetic liner) to prevent leaks from contaminating soil and groundwater. • Ensure that all fuel storage areas are properly banded (bermed or contained) to contain 110% of the stored volume in the event of a spill. • Ensure that spill equipment is in place and that all operators are properly trained in emergency response measures in the event of a spill.
Management of hazardous materials (fuels, lubricants, explosives etc.)	Contractor	<ul style="list-style-type: none"> • All hazardous materials shall be stored on impervious surfaces (preferably a synthetic liner), in well ventilated buildings that are locked and fenced when not in use. • Hazardous material storage and transport should follow national or sectoral regulations. Best practice is to locate storage areas at least 100 m from surface water bodies. • Workers shall be informed of the requirements for protective equipment for handling hazardous materials and MSDS (Material Safety Data Sheets) shall be provided.

Many of the issues, specially those related to construction activities, camp management, access roads, health, traffic, etc. identified for hydroelectric projects, are also applicable to wind and biomass projects. Some special considerations for these types of projects are presented in the following tables.

WIND POWER GENERATION

Phase	Issue	Mitigating Measure
Construction	Wind farm siting	<ul style="list-style-type: none"> • Avoid migratory and local bird flight paths and patterns • Consider vistas and aesthetic values • Avoid adverse tourism effects • Avoid forested areas
	Infringement on critical habitats or conservation areas	<p>Verify overall plant layout is not within 1 km of any critical areas and does not render them unusable by species of concern</p> <p>Select project site, transmission line route, access road route, construction camp-sites to avoid sensitive areas (other than residential), by at least 100 meters</p>
Operation	Noise (from turbines)	Turbines and/or associated rotating equipment should be designed to meet international standards
	Bird deaths	<p>Avoid migratory routes</p> <p>Design towers to be low enough to avoid flight paths</p> <p>Require only cylindrical closed towers (not lattice towers)</p>

BIOMASS POWER GENERATION

Phase	Issue	Mitigating Measure
Construction	Siting of power plant (avoid sensitive receptors particularly human settlements)	Survey area carefully to assure no sensitive receptors are within 1 km Check local land use plans
	Biomass storage facility location and transmission line routing	<u>Storage Facility</u> <ul style="list-style-type: none"> • Locate at least 1 km from any population center <u>Transmission line</u> <ul style="list-style-type: none"> • Small study to select appropriate route • Use existing rights-of-way wherever possible • Avoid migratory or local bird routes, particularly protected areas (e.g. Ramsar sites)
	Infringement on critical habitats or conservation areas	Verify plant site is not within 1 km and downwind of any critical areas and does not render them unusable by species of concern Select, access road route, construction camp-sites to avoid critical areas, by at least 100 meters. Schedule construction activities to avoid critical migratory or breeding periods
Operation	Dust emissions	Utilize high efficiency (>99+) dust removal systems: either baghouse or electrofilter
	Noise (from power house)	Turbines and/or associated rotating equipment should be designed to meet international standards (~80 db @ 1 meter). As necessary, equipment should be housed in sound insulated buildings, and/or trees shrubs planted around noisy equipment to further absorb sound.

	Ash disposal/management	<p>Survey local farmers as possible consumers of ash as fertilizer supplement</p> <p>Place excess ash in approved site or construct disposal site lined with impervious material (e.g. clay) to prevent groundwater contamination by leachate. Provide cover for site to prevent runoff contamination (primarily to be used during rainy season)</p>
	Cooling water supply/competitive uses	Small study to select cooling water source that provides minimal competition with existing water resource use
	Cooling water discharge and ecological impacts	Design cooling water discharge system so that thermal plume avoids any critical (e.g. feeding/breeding) areas, consider multiport diffuser for more rapid dispersion or cooling tower, if cooling water ecological impacts too risky, consider dry cooling
	Fire/explosion risk at biomass storage facilities	<ul style="list-style-type: none"> • Locate storage facilities downwind of any areas that can easily combust (forests, houses/buildings, fuel storage facilities etc.) • Surround with fireproof windbreak (e.g. concrete fence) • Provide ready access to firefighting personnel and equipment
	Traffic movements/traffic safety	<ul style="list-style-type: none"> • Limit biomass delivery truck speed to 25 km/hr (or legal limit if less) on rural roads, particularly when traveling through villages, market areas, school areas, playgrounds etc. • Require largest truck size possible consistent with delivery routes to minimize number of required daily trips • If possible, minimize truck transport at night • Limit drivers to an eight hour work shift. Consumption of alcoholic beverages during the work shift is strictly forbidden and grounds for dismissal and/or criminal action
	Dust release during transport	Keep biomass delivery trucks covered or spray contents with water

ANNEX 8: CHANCE FIND PROCEDURES

Background

Contracts for civil works involving excavations should normally incorporate procedures for dealing with situations in which buried physical and cultural resources (PCR) are unexpectedly encountered. The final form of these procedures will depend upon the local Vietnamese regulatory environment, including any 'chance find' procedures already incorporated in legislation dealing with antiquities or archaeology.

The following general guidelines are provided for subproject developers in order to deal with chance finds of physical and cultural resources and how this should be incorporated as contract provisions. Subproject developers should also contact to the Ministry of Culture, Sport and Tourism for further guidance.

Procedural Elements

Chance-Finds procedures commonly contain the following elements:

Definition of Physical Cultural Resources.

In some cases the Chance-Finds procedure are confined to archaeological finds; more commonly it covers all types of PCR. In the absence of any other definition from the local cultural authorities, the following definition should be used as per World Bank OP 4.11: *“movable or immovable objects, sites, structures or groups of structures having archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance”*.

Ownership

The identity of the owner of the artifacts found should be described. Depending on the circumstances, the owner could typically be, for example, the state, the government, a religious institution, the landowner, or could be left for later determination by the concerned authorities.

Recognition of PCR

This is a difficult aspect to cover. In PCR-sensitive areas, the procedure may require the contractor to be accompanied by a cultural resources specialist, or qualified archaeologist. In other cases, the procedures may not specify how the contractor will recognize a PCR, and the contractor may request a clause disclaiming liability.

Procedure upon Discovery

Suspension of Work

A contract provision may state that if a PCR comes to light during the execution of the works, the contractor shall stop construction works. However, it should also specify whether *all works* should be stopped, or only those works immediately involved in the discovery, or, in some cases where large buried structures may be expected, all works may be stopped within a specified distance (for example, 50 m) of the discovery. This issue should be clarified in the field by a qualified archaeologist or cultural resources specialist.

After stopping work, the contractor must immediately report the discovery to the resident engineer, or project manager.

The contractor may not be entitled to claim compensation for work suspension during this period.

The resident engineer, or project manager, may be entitled to suspend work and to request from the contractor some additional excavation work at the contractor's expense if it is suspected that a discovery was made but not reported.

Demarcation of the Discovery Site

With the approval of the resident engineer, or project manager, the contractor shall be required to temporarily demarcate (in a clearly visible manner), and limit access to, the site. This may require the provision of security measures.

Non-Suspension of Work

Contract provision may also consider allowing the resident engineer, or project manager, to decide whether the PCR can be removed and for construction works to continue, for example in cases where the find is one coin, or a small artifact. This will require agreement between all parties.

Chance Find Report

The contractor should then, at the request of the resident engineer or project manager, and within a specified time period, to prepare a *Chance Find Report*, detailing the following:

- Date and time of discovery;
- Location of the discovery;
- Description of the PCR;
- Estimated weight and dimensions of the PCR;
- Temporary protection measures implemented.

The *Chance Find Report* should be submitted to the resident engineer or project manager, with a copy to the PB, and other concerned parties as agreed with the cultural authority, and in accordance with Vietnamese legislation.

The resident engineer or project manager, or other party as agreed, is required to inform the cultural authority accordingly.

Arrival and Actions of Cultural Authority

The cultural authority shall undertake to ensure that a representative will arrive at the discovery site within an agreed time such as 24 hours, and determine the action to be taken. Such actions may include, but not be limited to:

- Removal of PCR deemed to be of significance;
- Execution of further excavation within a specified distance of the discovery point;
- Extension or reduction of the area demarcated by the contractor.

These actions should be taken within a specified period, for example, 7 days.

The contractor may or may not be entitled to claim compensation for work suspension during this period.

If the cultural authority fails to arrive within the stipulated period (for example, 24 hours), the resident engineer, or project manager, may have the authority to extend the period by a further stipulated time.

If the cultural authority fails to arrive after the extension period, the resident engineer, or project manager, may have the authority to instruct the contractor to remove the PCR or undertake other mitigation measures and resume work. Such additional works can be charged to the contract. However, the contractor may not be entitled to claim compensation for work suspension during this period.

Further Suspension of Work

During this 7-day period, the Cultural Authority may be entitled to request the temporary suspension of the work at or in the vicinity of the discovery site for an additional period of up to, for example, 30 days.

The contractor may, or may not be, entitled to claim compensation for work suspension during this period.

However, the contractor will be entitled to establish an agreement with the Cultural Authority for additional services or resources during this further period under a separate contract with the cultural authority.

ANNEX 9: MONITORING PLAN FRAMEWORK

Phase/Issue	<i>Who is to monitor</i>	<i>When is monitoring to be done?</i>	<i>What parameter is to be monitored?</i>	<i>Where is the parameter to be monitored?</i>	<i>How is the parameter to be monitored/ type of monitoring equipment?</i>
CONSTRUCTION					
Siting of construction camps and camp services	Developer	Monthly, formal quarterly report to PB and PMB	Camp location – disturbed or undisturbed site Arrangements for water supply, sewage, and solid waste Campsite properly restored?	Camp site Water supply Sewage and garbage disposal sites Waste register Campsite	Visual
Vegetation clearing and topsoil stripping	Contractor	Monthly, formal quarterly report to PB and PMB	Vegetation debris, disposal practices Adequacy of topsoil temporary storage site (covered and erosion protection measures in place). Landscape plan and reinstatement plan in place	Vegetation disposal and/or storage site Topsoil temporary storage site when completed, revegetation site	Visual
Civil works	Contractor	Monthly, formal quarterly report to PB and PMB	Waste rock and spoil disposal	Waste rock disposal sites identified.	Visual

Phase/Issue	Who is to monitor	When is monitoring to be done?	What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored/ type of monitoring equipment?
Construction engine equipment exhausts	Contractor	Monthly, formal quarterly report to PB and PMB	Vietnamese registration		Visual
Soil erosion and sedimentation	Contractor	Prior to start of construction	Construction proceeding in dry season? Appropriate silt traps, temporary erosion control and runoff discharge systems in place	Structure site Sites prone to erosion	Visual
Noise	Contractor	Monthly, formal quarterly report to PB and PMB	Construction hours Sound barriers needed and installed? Local population informed of any “off-hour” construction at least one week in advance	Construction site	Site observation Visual Spot noise monitoring
Dust	Contractor	Monthly, formal quarterly report to PB and PMB	Water spraying performed properly? Water withdrawal sites identified, frequency of withdrawal and impact on stream flows, if surface water.	Construction site and access roads Water withdrawal sites	Visual Develop register for water withdrawal

Phase/Issue	Who is to monitor	When is monitoring to be done?	What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored/ type of monitoring equipment?
Worker safety	Contractor	At start of individual worker shifts, weekly or monthly checks as necessary	Acceptable health and safety plan prepared? Safety equipment provided to and being used by workers?	Active work areas requiring PPE	Visual (with a copy of the health and safety plan for verification)
Access road siting and construction	Contractor	Before construction and to end of construction period	Route selection offers minimal intrusion with new construction, tree cutting, use of productive land etc. Develop access road register for existing and new access	Access road locations	Visual review of plans, site visit, air photos Update access road register on monthly basis
Transmission line routing and construction	Contractor	Before construction	Route selection offers minimal intrusion with new construction, tree cutting, use of productive land etc. Migratory bird paths, Ramsar sites etc. avoided?	Transmission line route selection	Visual review of plans, site visit
Chance find of cultural artifacts, and areas/structures of local cultural value	Contractor and Developer	During construction	Accidental find of articles of cultural value Location of any cemeteries or structures (natural or man-made) of local value	At any excavation site Along planned alignment routes of any transmission towers, or newly planned access roads	Determine of authorities notified and proper procedures followed? Determine if proper completed

Phase/Issue	Who is to monitor	When is monitoring to be done?	What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored/ type of monitoring equipment?
			Confirm chance find procedures in place		
Management of hazardous materials (fuels, lubricants, explosives etc.)	Contractor	Before start of construction and monthly	Storage facilities locked, fenced, well ventilated, on impervious ground? Location far from population centers and more than 100 m from waterbody locations	Hazardous materials storage site	Visual inspection all fuel, material and chemical storage areas
Solid waste	Contractor	Monthly, formal quarterly report to PB and PMB	Landfill location Camp waste accumulation area identified. Segregation and recycling of waste streams	Off site landfill locations Camp central waste accumulation areas	Develop waste register to record volumes of waste generated and where they are disposed
Potable water quality in camp supplies	Contractor	Monthly, formal quarterly report to PB and PMB	Potable water sources should be monitored as to standard water quality parameters to ensure a safe water supply is provided to workers.	Water withdrawal location or treatment plant	Visual, take water samples and have analyzed in a certified laboratory
Sewage and grey water	Contractor	Monthly, formal quarterly report to PB and PMB	Confirm if municipal connection in place, if not confirm sewage disposal system in place at camp	Outfall of sewage disposal Develop waste register to record waste water	Visual, take water samples and have analyzed in a certified laboratory

Phase/Issue	Who is to monitor	When is monitoring to be done?	What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored/ type of monitoring equipment?
			Monitor standard parameters as required by regulation – BOD, pH, oil and grease, COD, TSS, coliforms etc.	performance	

Phase/Issue	Who is to monitor	When is monitoring to be done?	What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored/ type of monitoring equipment?
OPERATION					
Noise (from power house)	Developer	Monthly, formal quarterly report to PB and PMB	Noise levels Sound absorbing measures installed (housing, tree planting, sound barriers etc.)	At or near power house Nearest population centers (particularly if there are complaints)	Portable noise monitoring equipment - db meter Visual
Solid waste	See above				
Sewage and grey water	See above				

WIND PROJECT MONITORING PLAN

Phase/Issue	What <i>parameter is to be monitored?</i>	Where <i>is the parameter to be monitored?</i>	How <i>is the parameter to be monitored/ type of monitoring equipment?</i>	When <i>is the parameter to be monitored-frequency of measurement or continuous?</i>	Responsibility
Construction					
Wind farm siting	Is the wind farm placed in the path of any bird flight patterns?	At the project site	Visual	Before construction starts	PB
	Does the wind farm block any vistas or diminish any aesthetic values?	At the wind farm along different lines of sight (east, west, north, south)	Visual	Before construction starts	
	Changes in tourism statistics	Local tourist enterprises (shops, hotels, restaurants etc.)	Visual	After one year of operation	
	Any forested areas nearby?	General vicinity of windfarm	Visual	Before construction starts	
				Visual	
Infringement on critical habitats and conservation areas	Impoundment area influence critical habitats?	Project site (including impounded areas)	Visual/survey	Prior to construction, after preliminary design Prior to construction, after	Developer

	Project site and off-sites avoid sensitive areas by at least 100 meters?	Project site location, off-site locations	Visual/survey	preliminary design	
Operation					
Noise (from wind turbines)	Noise at ground level	Within 10 meters of wind machine base or at local population centers	Db meter	Quarterly or if local groups complain	Operator/Developer
Bird deaths	Type and species of dead birds found	At the site of each wind machine	Visual	Quarterly, for at least two years (assuming no problem is identified)	Operator/Developer

BIOMASS PROJECT MONITORING PLAN

Phase/Issue	What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored/ type of monitoring equipment?	When is the parameter to be monitored-frequency of measurement or continuous?	Responsibility
Construction					
Siting of power plant (avoid sensitive receptors particularly human settlements)	Proposed plant location avoids current and any planned population centers?	Plant site and surrounding area for 1 km	Visual	Before starting construction	PB
Biomass storage facility location and transmission line routing	Location of biomass storage facility Route selection	Storage facility and surrounding area for 1 km	Visual review of plans, and transmission line route, site visit to	Before starting construction	PB/Developer

	offers minimal intrusion with new construction, tree cutting, use of productive land etc. Migratory bird paths, Ramsar sites etc. avoided?	Transmission line route	storage facility location and transmission line route		
Infringement on critical habitats or conservation areas	Plant site area influence critical habitats? Project site and off-sites avoid critical areas by at least 100 meters? Construction schedule avoids critical migration and/or breeding periods?	Project site Project site location, off-site locations Critical habitat locations	Visual/survey Visual/survey Visual/survey	Prior to construction, after preliminary design Prior to construction, after preliminary design Prior to construction, after preliminary design	PB
Operation					
Dust emissions	Flue gas dust concentration	Flue duct near the top of the chimney	Opacity or gravimetric	After steady operation, then every three months or when there is a change in fuel composition	Developer
Noise (from power house)	Noise levels Sound absorbing measures installed (housing, tree	At or near power house Nearest population centers	dB[a] meter Visual	Quarterly, or immediately after any complaint is lodged by local population	Developer

	planting, sound barriers etc.)	(particularly if there are complaints)			
Ash disposal/management	Degree of utilization among farmers	Local farms	Survey	Annually	Developer
	Disposal site design with liner and cover?	Disposal site	Visual	Before ash disposal operation starts	
	Groundwater quality (phenol, trace metals)	Below disposal site	Spectrometry, atomic absorption	Annually, more frequently if standards are exceeded and remedial measures are taken	
Cooling water supply/competitive uses	Changes in local water resource use characteristics	Local water users	Survey	End of first year of operation, annually if adverse competitive situation arises	PB
Cooling water discharge and ecological impacts	Discharge outlet temperature, area and shape of thermal plume agree with predictions?	Receiving water body	Thermometry	Annually for two years, once during dry season and once during wet season. More frequently if predictions are not verified,	Developer
	Ecological impacts (alteration of fish feeding, breeding or migration patterns, destruction of benthic colonies, destruction of aquatic vegetation etc)		Ecological survey	Ecological impacts determined and remedial measures are taken	
Fire/explosion risk at biomass storage facilities	Storage facilities located downwind of areas that can easily burn (forests, houses, buildings, fuel storage facilities)	At biomass storage facility site and surrounding areas	Visual survey	Before storage facility is allowed to be used	PB

	<p>etc.)?</p> <p>Facility surrounded with fireproof windbreak (e.g. concrete fence)?</p> <p>Ready access to firefighting personnel and equipment available?</p>				
<p>Traffic movements/traffic safety</p>	<ul style="list-style-type: none"> Truck speed 	<p>Along delivery route, particularly at population centers or population (particularly children congregation sites)</p>	<p>Visual or arrangements with local law enforcement authorities</p>	<p>Daily, at random times</p>	<p>PB/Developer</p>
	<ul style="list-style-type: none"> Truck capacity 	<p>At plant entry gate</p>	<p>Visual</p>	<p>Monthly</p>	
	<ul style="list-style-type: none"> Truck delivery schedules Worker shift periods 	<p>At plant entry gate</p> <p>At plant entry gate</p>	<p>Visual</p> <p>Visual</p>	<p>Monthly</p> <p>Monthly</p>	
<p>Dust release during transport</p>	<p>Truck contents covered or sprayed with water?</p>	<p>At plant entry gate</p>	<p>Visual</p>	<p>Weekly, reduced to monthly if no violations are observed</p>	<p>PB/Developer</p>

ANNEX 10: ESF FRAMEWORK COMPLETENESS CHECKLIST

	Item	Available in Files	
		Yes	No
1	Copy of Approved EIA or EPC		
2	Copy of EIA or EPC approval letter from DONRE/MONRE		
3	Copy of subproject developer World Bank screening evaluation and eligibility assessment		
4	PB/Subproject Loan Contract include obligation to implement EMP		
5	Copy of EMP		
6	EMP implementation costs included in Sub-project financing plan		
7	PB due diligence letter to PMB verifying environmental eligibility		
8	Copy of PMB letter to sub-project file indicating completeness of all environmental safeguard information		
9	Copy of Subproject developer transmittal letter to World Bank regarding public disclosure of EMP (Note: disclosure is performed after subproject is approved for refinancing under REDP)		
10	Copy of PB Due Diligence Memorandum to PMB indicating approval of EMP, acceptability of Public Consultation and Disclosure procedures		

ANNEX 11: KEY REFERENCES

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