Environmental Assessment and Review Framework

May 2014

Proposed Grant and Administration of Grant
Republic of Maldives: Preparing Outer Islands for Sustainable Energy Development

Prepared by Ministry of Environment and Energy, Government of Maldives for the Asian Development Bank

CURRENCY EQUIVALENTS
(as of 31 March 2013)

Currency Unit	=	Maldivian Ruffiyaa (MVR)
MVR1.00	=	US$ 0.065
US$1.00	=	MVR 15.410

LIST OF ABBREVIATIONS

ADB	-	Asian Development Bank
CFC	-	Chlorofluorocarbons
DG	-	Diesel Generator
EA	-	Executing Agency
EARF	-	Environmental Assessment and Review Framework
EIA	-	Environmental Impact Assessment
EPA	-	Environmental Protection Agency
EMP	-	Environmental Management Plan
EPC	-	Engineering, Procurement and Construction
FENAKA	-	Fenaka Corporation Limited
GoM	-	Government of Maldives
GDP	-	Gross Domestic Product
GHG	-	Green House Gases
GRC	-	Grievance Redress Committee
GFP	-	Grievance Focal Point
IA	-	Implementing Agency
IEE	-	Initial Environmental Examination
MEE	-	Ministry of Environment and Energy
MOF	-	Ministry of Finance
PCBs	-	polychlorinated biphenyl
PMC	-	Project Management Consultant
PPTA	-	Project Preparatory Technical Assistance
PV	-	photovoltaic
REA	-	Rapid Environmental Assessment
SPS	-	Safeguard Policy Statement
STELCO	-	State Electric Company Limited
TA	-	Technical Assistance
WHO	-	World Health Organization

NOTES

(i) The fiscal year (FY) of the Government of Madives ends on 31 December. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2012 ends on 31 December 2012.

(ii) In this report, "$" refers to US dollars

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A. INTRODUCTION

1. This document provides the Environmental Assessment and Review Framework (EARF) for the assessment for sub-projects to be included in the sector program for the proposed Preparing Outer Islands for Sustainable Energy Development Project (POISED or the Project). These sub-projects to be planned during the implementation of the Project. The Project components include (i) development of renewable energy ready mini grid systems for outer islands, and (ii) capacity enhancement of MEE, FENAKA and STELCO to implement renewable energy mini grid projects. Under renewable energy mini-grid system, hybrid energy systems comprise generation mix of solar-diesel will be installed in about 160 medium to small outer islands of the Maldives.

2. A suitable renewable energy system (sub-project) for each island is identified as part of the sector program as defined in the long-term roadmap and these sub-projects will be progressively reanalyzed, screened and assessed during Project implementation. The EARF outlines the procedures that will be followed for environmental assessment and review of proposed sub-projects in accordance with the Asian Development Bank (ADB) Safeguard Policy Statement (SPS, 2009) as well as in compliance with Government of Maldives (GoM) environmental assessment requirements. The EARF is intended primarily for use and reference by: (i) the Ministry of Environment and Energy (MEE); and (ii) ADB; but also by (iii) State Electric Company (STELCO) and the Fenaka Corporation Limited (FENAKA); (iv) participating communities and Atol/City/Island Councils; and (v) other stakeholders, including equipment vendors and energy services suppliers. Prior to Project appraisal, the EARF will be translated into Dahevi and disseminated accordingly, with the English version posted on the ADB website

B. PROJECT AND OUTPUT REVIEW

3. The proposed “Preparing Outer Islands for Sustainable Energy Development (POISED)” project is part of the Scaling Up Renewable Energy Program (SREP) to reduce diesel dependence in the Maldives, improve the electricity sector, and address key macroeconomic issues through tapping into indigenous and cheaper sources of electricity.

4. The Project would enhance renewable based sustainable energy sector in the Maldives to be measured by increase of renewable energy (RE) in the supply mix of the Maldives, reduction in CO_2 emissions, and increase in cost coverage through tariffs. The outcome would be the reduction of diesel usage for electricity generation in outer islands of the Maldives to be measured by reduction of diesel consumption per unit of electricity in the outer islands by 2020. The outputs include (i) development of renewable energy ready mini grid systems for outer islands, (ii) capacity enhancement of EA and IAs to implement renewable energy mini grid projects.

5. A phased intervention strategy has been proposed for the introduction of the RE in Maldives. In the first phase demonstration hybrid RE projects are proposed be implemented on five outer islands of Maldives namely: B. Goidhoo, Lh. Kurendhoo, Th. Buruni, Ga. Villingili and Addu City; under ADB financing and in the subsequent phases these RE hybrid solutions shall be extended in about 160 outer islands of Maldives at commercial development under the sector program as defined in the Road Map long-term strategy.

6. A detailed assessments of the RE resources (solar and wind) in Maldives has been undertaken and optimal individual RE solutions are proposed for each Islands. The scope of

RE solutions envisaged under the Project in mostly include introduction of Solar-Diesel Hybrid System on about 160 outer islands of Maldives. Various components of the proposed RE solution on islands include:

- **Component 1:** Installation of solar PV system (ground mounted and roof top)
- **Component 2:** Diesel generation by replacement of inefficient DG sets and addition of new DG sets
- **Component 3:** Refurbishment of distribution mini-grid systems
- **Component 4:** Capacity building of PMU/FENAKA/STELCO staff on O&M of RE systems.

7. The Project will construct and operate hybrid energy systems that include solar power generation units (on ground and roof-top) with a total capacity of 20888 kWp and 40170 kW diesel generations on about 160 target islands. The combined capacity of proposed hybrid energy system is 61058 kW. Diesel generation would be added to the existing generation system by installing additional generators in existing power plants or by changing the inefficient equipment in each island whereas solar energy generation would be new addition. Solar generation would be manly by installing solar PV panels (ground mounted and roof-top of public buildings). The hybrid system would range from 20 kWp to 1 MWp solar PV system and 35 kW to 1600kW diesel generators. Besides this, Li-Ion based battery storage system will also be installed in each island as part of hybrid energy system. The solar power generation units will consist in a set of solar photovoltaic (PV) modules, power inverters, switchgear, associated protection, control and monitoring equipment's, and associated civil works. The electricity output will be directly fed into existing distribution networks of STELCO/ FENAKA / island councils for further distribution. Wherever required distribution grid will be upgraded by replacing grid assets such as underground cable, distribution boxes, switchgears etc. Table 1 presents the proposed capacity by components under the Project.

Table 1: Proposed Interventions and Estimated Capacity under the Project

Proposed System	Proposed Capacity (kW)	
	On 5 Priority Islands	**On 160 Islands**
Diesel	8164	40170
Solar	2500	20888
Total	**10664**	**61058**

8. Indicative list of sub-projects[1] proposed for implementation on about 160 outer islands as part of the POISED Project is provided in Appendix 1.

9. The key agencies to be involved in the Project are the Ministry of Finance and Treasury (MoET) as Project's Executing Agency (EA), and MEE, FENAKA and STELCO being the Implementing Agencies (IAs), project management consultant (PMC), EPC contractor(s), and other line agencies including the Environment Protection Agency (EPA) and Waste Management Division within EPA. EA has overall responsibility for all aspects of the Project. EA through support from IAs and support of PMC will be responsible for day-to-day management of technical aspects of the Project. The project will be executed over a period of approximately five years from the date of grant effectiveness.

10. The Project is part of the SREP overall investment plan on the outer islands. The overall investment plan for the energy sector transformation on the outer islands would be about $

[1] As of now about 138 islands are identified by EA. Remaining Islands will be identified in the subsequent stages as the project process.

114 million over the period 2014-2019 and would be financed through Asian Development Bank Grant (38 million), SREP (12 millions), ISDB (10 million), EIB (40 millions), and Government of Maldives (14 millions). The project will be developed into four phases comprising in Phase 1 the 5 islands of the pilot study, and then subsequently ordered by geographical areas, savings in subsidies and economic feasibility.

11. Solar PV systems face more challenges on the affordability of the tariff and sustainability of each sub-project when compared to other RE plants due to higher upfront capital cost per benefiting household. To reduce capital cost by utilizing economies of scale, bundled procurement based on turnkey contracts will be undertaken, considered feasible due to standardized major equipment such as the solar PV modules, gensets, and battery banks. All procurement will be conducted in turnkey basis. Additional details on funds flow and other implementation arrangements will be incorporated into the project administration manual.

12. Consultants (individuals or firm) for capacity development will be recruited in accordance with ADB's Guidelines on the Use of Consultants (2010, as amended from time to time). All procurement to be financed under ADB fund and/or ADB administered funds will be carried out in accordance with ADB's Procurement Guidelines (2010, as amended from time to time).

C. ASSESSMENT OF LEGAL FRAMEWORK AND INSTITUTIONAL CAPACITY

13. Environmental assessment of the Project will be carried out in compliance with ADB's SPS and the government's legislation and requirements. The laws, regulations, policies and guidelines that may be applicable to the Project based on the location, design and operation of sub-projects, which are mostly yet to be confirmed, are summarized in the subsequent sections.

1. The Government Environmental Laws and Regulations

14. Some of the important laws and regulation of Maldives relevant to the Project focusing on environmental management are summarized in Table 2.

Table 2: Summary of Relevant Environmental Laws and Regulations of Maldives

Environmental Legislation	Year Passed	Objective
Environment Protection and Preservation Act (Act No. 4/93)	2003	The Environment Protection and Preservation Act of Maldives (Law No. 4/93) provides the basic framework for environmental management in Maldives including Environemntal Impact Assessment Process which is being currently implemented by EPA on behalf of MEE. Articles 2, 4, 5, 6, 7, and 8 of the law are relevant to the POISED Project. • Article 2 states that the concerned government authorities shall provide the necessary guidelines and advise on environmental protection in accordance with the prevailing conditions and needs of the country. All concerned parties shall take due considerations of the guidelines provided by the government authorities. The project proponent shall abide by any guidelines or advice given by the concerned Government authorities for the Project. The concerned

Environmental Legislation	Year Passed	Objective
		Government authorities are identified in this Chapter. • Article 4 states that the Ministry of Environment and Energy shall be responsible for identifying protected areas and natural reserves and for drawing up the necessary rules and regulations for their protections and preservation. The proponent shall ensure that there is no negative impact from the proposed Project on any protected areas. • According to Article 5 (a) of the Act, an Environmental Impact Assessment study shall be submitted to the Ministry of Environemnt and Energy before implementing any activity that may have an impact on the environment. The project proponent has prepared and submitted necessary documents to the EPA to fulfil the legal requirement stipulated in Act (4/93) Article 5. Proposed POISED Porject do not need EIA as per Government regulations. • According to Article 6, the Ministry of Environemnt and Energy has the authority to terminate any project that has any undesirable impact on the environment. A project so terminated shall not receive any compensation. The project proponent is aware of this provision and will take all practical measures to ensure there is no irreversible and significant negative impact of the project. • Article 7 of the Act (Act No. 4/93) prohibits the disposal of wastes, oil and gases in a manner that will damage the environment. Wastes, oil and gases has to be disposed off in areas designated by the Government. Hence, the project proponent shall use the Environmental Management Plan for this project which specifies how the wastes, oil and gases generated by the project will be disposed. • Article 8 of the Act No. 4/93) prohibits the disposal of hazardous wastes. Any hazardous wastes that may be generated from the project shall be transferred to the designated waste sites for disposal according to Government regulations and standards.
Environmental Impact Assessment Regulation 2012	2007 (revised in 2012)	• The EIA Regulation, which came into force in 2007, has been recently revised and the revised EIA Regulation 2012 is currently in force since May 2012. • The EIA Regulation 2012 is currently only in Dhivehi and an official translation is awaited. The Regulation sets out the criteria to determine whether a development proposal is likely to significantly affect the environment and is therefore subject to an EIA. Schedule D of the EIA Regulations defines the type of projects that would be subject to Environmental Impact Assessment. • The main purpose of this Regulation is to provide step-by-step guidance for proponents, consultants, government agencies and general public on how to obtain approval in the form of an Environmental Decision Statement.
Regulation on Uprooting, Cutting	2006	The primary purpose of the Regulation is to control and regulate large- scale uprooting, removal, cutting and

Environmental Legislation	Year Passed	Objective
and Transportation of Palms and Trees		transportation of palms and trees from one island to another. According to the regulation, certain types of trees and plants that have unique attributes are prohibited to be removed from its natural environment. Also, uprooting and removal of 10 or more trees and palms are subject to environmental impact assessment (EIA), which is required to be submitted to the Environmental Protection Agency and written approval is required prior to implementation of the project.
Environemntal Damage Liabilities Regulation, 2011	2011	The main purpose of this regulation is to stop unlawful activities on environment and adequately implement a fining procedure for violations as well as implement a compensation mechanism on environmental damages. Its Schedules form the basis for levying fines on various environmental components and activities.
National Environmental Action Plan III (NEAP III)	-	The NEAP III of the Government of Maldives sets out the agenda for environmental protection and management for the period 2009 till 2013. NEAP III provides the basis for environmental planning, budgeting, performance measurement and accountability. The key target of NEAP III is to achieve measurable environmental results that matter to the people of the Maldives.
National Biodiversity Stretegy and Action Plan 2002	2002	The goals of the National Biodiversity Strategy and Action Plan (MHAHE, 2002) are: • Conserve biological diversity and sustainable utilization of biological resources. • Build capacity for biodiversity conservation through a strong governance framework, and improved knowledge and understanding. • Foster community participation, ownership and support for biodiversity conservation.
The Strategic Action Plan 2009 – 2013	-	The Strategic Action Plan 2009 - 2013 (SAP) of the Government of Maldives sets out the agenda for environmental protection and management as one of the key area. SAP provides the basis for environmental planning, budgeting, performance measurement and accountability. The new policy focus is to ensure sustainable adaptation measures and is developed on the view that ability to adapt to environmental degradation is fundamentally linked to good governance and careful planning.
Waste Management Policy		The aim of the waste management policy is to formulate and implement guidelines and means for solid waste management in order to maintain a healthy environment. Accordingly, the key elements of the policy include: • Ensure safe disposal of solid waste and encourage recycling and reduction of waste generated; • Develop guidelines on waste management and disposal and advocate to enforce such guidelines through inter-sectoral collaboration;

Environmental Legislation	Year Passed	Objective
		• Ensure safe disposal of chemical, hazardous and industrial waste.
Waste Regulations 2013	2013	The aim of the regulation is to protect environment through implementation of national waste management policy and to achieve the following: • To minimise direct and indirect negative impacts that occurs or may occur resulting from waste to environment and human health • To formulate waste management standards • To develop interlinked framework and a mechanism to manage waste in environment friendly, safe and sustainable manner • To encourage waste reduction, reuse, recycling and recover • To implement polluter pay principle • To introduce extended producer responsibility
Regulations of Conservation of Old Trees	-	Due to the rapid increase in cutting down of trees impacting natural features and loosing the greenness of the islands. The regulation aims to conserve and protect old trees which are rare and are in extinct at island, atoll and national level. This regulation also aims to fulfil obligations under "Convention on Biological Diversity" which Maldives has signed and aims to support environmental initiatives under taken by the Maldives at national, regional and global level. Four categories of trees protected under this regulation: • Based on the age of trees (50-100 and over 100 years old) • Based on the number of trees in Maldives or on particular island • Based on environmental importance • Based on community requests (individually or community as a whole) This regulation was formulated under Environment Protection and Preservation Act (Act No. 4/93), clause 4.

Source: Environmental Protection Agency (EPA) of the Republic of Maldives under the Ministry of Environment and Energy (www.epa.gov.mv)

2. International and Regional Agreements and Conventions

15. The Republic of Maldives is a party and signatory to several international and regional environmental agreements to which the MEE is the National Focal Point or the EPA is the Implementing Agency. Some of the international conventions / declarations to which Republic of Maldives is a party are:

- UN Convention on the Law of the Sea – UNCLOS (1982)
- International Convention for the Prevention of Pollution of the Sea by Oil (1982)
- Vienna Convention for the Protection of the Ozone Layer (1985)
- Montreal Protocol on Substances that Deplete the Ozone Layer (1987)

- Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal (1989)
- The London Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (1990)
- Agenda 21 and the Rio Declaration of the United Nations Conference on Environment and Development (1992)
- Convention on Biological Diversity (1992)
- United Nations Framework Convention on Climate Change (1992)
- The Copenhagen Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (1992)
- The Montreal Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (1997)
- The Beijing Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (1999)
- Washington Declaration on Protection of the Marine Environment from Land- Based Activities
- Kyoto Protocol to the United Nations Framework Convention on Climate Change (1998)
- Cartagena Protocol on Biosafety (Maldives acceded on 2 September 2002)
- United Nation Convention to Combat Desertification (2002).

16. The Republic of Maldives is also a key player in formulating and adopting various regional plans and programmes to protect the environment by continuously participating in various activities organized by regional bodies such as SACEP, ESCAP and SAARC. As a result the Republic of Maldives is committed to the following:

- SAARC Environment Action Plan adopted in 1997 in Male'
- SAARC Study on Greenhouse Effect and its Impact on the Region
- South Asian Regional Seas Action Plan and Resolutions concerning its implementation (1994)
- SAARC Study on Causes and Consequences of Natural Disasters
- South Asian Seas Programme initiated by SACEP, and
- Male' Declaration on Control and Prevention of Air Pollution and its likely Transboundary Effects for South Asia (1998).

17. The interventions proposed under the Project shall be implemented in compliance with applicable international/regional conventions and declarations listed above.

3. Environmental Assessment Process in the Maldives

18. Under the Maldivian regulatory framework (Act No 4/93 and EIA Regulations 2012) all development activities must be referred to the Minister of Environment and Energy. According to Article 5 (a) of the Act, an Environmental Impact Assessment study shall be submitted to the Ministry of Environment and Energy before implementing any activity that may have an impact on the environment. The project proponent need to prepare requisite documents for each sub-project to fulfill the legal requirement stipulated in Act (4/93) Article 5.

19. EIA Regulations were issued by the Ministry of Environment and Energy on 8th May 2012. The first step in environmental assessment process involves screening of the project to

be classified as one that requires an EIA or not. Based on this decision, the Ministry then decides the scope of the EIA, which is discussed with the proponent and the EIA consultants in a “scoping meeting”. The consultants then undertake the EIA starting with baseline studies, impact prediction and finally reporting the findings with impact mitigation and monitoring program. The report shall follows the principles and procedures for EIA outlined in the EIA regulations.

20. The EIA report is then submitted to the EPA. Following the review of the EIA by the EPA an EIA Decision Note will be given to the proponent who will have to implement the Decision Note accordingly. As a condition of approval, appropriate environmental monitoring may be required and the proponent shall have to report monitoring data at required intervals to the Ministry. The project proponent shall be committed to implement all impact mitigation measures that are specified in the EIA report. Furthermore, the proponent shall be committed to environmental monitoring and shall fulfill environmental monitoring requirements that may be specified in the EIA decision note as a condition for project approval.

3.3.1 Environmental Impact Assessment (EIA) Decision Note

21. The most important environmental permit to initiate sub-project work would be a decision regarding the EIA. The EIA Decision Note, as it is referred to, shall govern the manner in which the sub-project activities must be undertaken. The EIA report assists decision makers in understanding the existing environment and potential impacts of the sub-project. Therefore, the Decision Note may only be given to the Proponent after a review of EIA document following which the EPA may request for further information or provide a decision if further information is not required. In some cases, where there are no major environmental impacts associated with the project, the EPA may provide the Decision Note while at the same time requesting for further information.

3.3.2 Government Requirements for sub-projects assessment

22. The sub-projects to be implemented under the Project mainly involve implementation of solar-diesel hybrid energy systems (solar PV system on roof-top and ground mounted). This activity is not listed in the list of activities (Appendix D of the EIA Regulations 2012) require an EIA. Therefore an Environmental Screening Form (for each sub-project) needs to be submitted to the EPA by the project proponent (MEE) to check whether sub-projects require an EIA or not. After reviewing the scope of sub-projects, the EPA will issue a decision stating that weather sub-project activities in target islands require an EIA or not. If a particular sub-project requires an EIA, MEE will prepare an EIA and get approval form EPA in compliance with Government regulations.

4. ADB’s Environmental Safeguard Requirements

23. The objective of ADB’s due diligence for the sector project is that EA ensures the environmental soundness and sustainability of projects and to support the integration of environmental considerations into the project decision-making process. Environmental safeguards are triggered if a project is likely to have potential environmental risks and impacts.

24. The SPS Requirements (SR1): Environment are based on the following policy principles:

- Use screening process for each proposed project to determine the appropriate extent and type of environmental assessment so that appropriate studies are undertaken commensurate with the significance of potential impacts and risks.

- Conduct an environmental assessment for each proposed project to identify potential direct, indirect, cumulative, and induced impacts and risks to physical, biological, socioeconomic (including impacts on livelihood through environmental media, health and safety, vulnerable groups, and gender issues), and physical cultural resources in the context of the project's area of influence. Assess potential transboundary and global impacts, including climate change. Use strategic environmental assessment where appropriate.

- Examine alternatives to the project's location, design, technology, and components and their potential environmental and social impacts and document the rationale for selecting the particular alternative proposed. Also consider the no project alternative.

- Avoid, and where avoidance is not possible, minimize, mitigate, and/or offset adverse impacts and enhance positive impacts by means of environmental planning and management. Prepare an environmental management plan (EMP) that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators. Key considerations for EMP preparation include mitigation of potential adverse impacts to the level of no significant harm to third parties, and the polluter pays principle.

- Carry out meaningful consultation with affected people and facilitate their informed participation. Ensure women's participation in consultation. Involve stakeholders, including affected people and concerned nongovernment organizations, early in the project preparation process and ensure that their views and concerns are made known to and understood by decision makers and taken into account. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to environmental assessment. Establish a grievance redress mechanism to receive and facilitate resolution of the affected people's concerns and grievances regarding the project's environmental performance.

- Disclose a draft environmental assessment (including the EMP) in a timely manner, before project appraisal, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. Disclose the final environmental assessment, and its updates if any, to affected people and other stakeholders.

- Implement the EMP and monitor its effectiveness. Document monitoring results, including the development and implementation of corrective actions, and disclose monitoring reports.

- Do not implement project activities in areas of critical habitats, unless (i) there are no measurable adverse impacts on the critical habitat that could impair its ability to function, (ii) there is no reduction in the population of any recognized endangered or critically endangered species, and (iii) any lesser impacts are mitigated. If a project is located within a legally protected area, implement additional programs to promote and enhance the conservation aims of the protected area. In an area of natural habitats, there must be no significant conversion or degradation, unless (i) alternatives are not available, (ii) the overall benefits from the project substantially outweigh the environmental costs, and (iii) any conversion or degradation is appropriately mitigated. Use a precautionary approach to the use, development and management of renewable natural resources.

- Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health and Safety Guidelines, 2007. Adopt

- cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gases emissions, waste generation, and release of hazardous materials from their production, transportation, handling, and storage. Avoid the use of hazardous materials subject to international bans or phase-outs. Purchase, use, and manage pesticides based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides.

- Provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease. Establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of local communities.

- Conserve physical cultural resources and avoid destroying or damaging them by using field-based surveys that employ qualified and experienced experts during environmental assessment. Provide for the use of "chance find" procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.

4.1 Screening and Categorization

25. Project screening and categorization are undertaken by the ADB to: (i) provide an initial indication of the significance of the project's potential environmental impacts and risks; and (ii) identify the type and extent of environmental assessment[2] and institutional resources required for safeguard measures, proportionate to the nature, scale, magnitude and sensitivity of the proposed project's potential impacts.

26. ADB, in consultation with the client/borrower, screens and categorizes the project based on the significance of potential project environmental impacts and risks. The environment category of a project is determined based on the project's most environmentally sensitive component. This involves consideration of (i) site sensitivity and (ii) project processes and activities during construction and operation. Categorization requires basic information on project design and operation, the proposed project site/s and general site features. ADB assigns one of the following environmental categories to the proposed project:

> **Category A.** The project is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented; impacts may affect an area larger than the sites or facilities subject to physical works. A full-scale environmental impact assessment (EIA), including an environmental management plan (EMP), has to be prepared by the borrower/client.
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> **Category B**. The project's potential environmental impacts are less adverse and fewer in number than those of category A projects; impacts are site-specific, few if any are irreversible, and impacts can be readily addressed through mitigation measures. An initial environmental examination (IEE), including an EMP, has to be prepared by the borrower/client.
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> **Category C**. The project is likely to have minimal or no adverse environmental impacts. An EIA or IEE is not required, but the ADB will conduct a desk review of the project's environmental implications.

4.1 Biodiversity

[2] "Type" refers to strategic environmental assessment (SEA), project environmental assessment, or compliance audit; "Level" refers to a full environmental impact assessment for Category A projects, and an initial environmental examination for Category B projects.

27. ADB's biodiversity requirements will be applied at the sub-project screening stage and in subsequent environmental assessments. Sub-projects located within legally protected areas or within 1 km of critical habitat/legally protected areas will not be considered under the Project..

28. MEE will assess the impacts and risks on biodiversity[2] and natural resources in sub-project environmental assessments, identifying measures to avoid, minimize, or mitigate potentially adverse impacts and risks. These requirements for each type of habitat are:

29. **Modified Habitats**: where the natural habitat has been altered, such as in agricultural areas, the borrower/client will exercise care to minimize any further conversion or degradation of such habitat, and will, depending on the nature and scale of the project, identify opportunities to enhance habitat and protect and conserve biodiversity as part of project operations.

30. **Natural Habitats**: In areas of natural habitat,[3] the project will not significantly convert or degrade[4] such habitat, unless the following conditions are met:

(i) No alternatives are available.

(ii) A comprehensive analysis demonstrates that the overall benefits from the project will substantially outweigh the project costs, including environmental costs.

(iii) Any conversion or degradation is appropriately mitigated.

31. Mitigation measures will be designed to achieve at least no net loss of biodiversity. They may include a combination of actions, such as post-project restoration of habitats, offset of losses through the creation or effective conservation of ecologically comparable areas that are managed for biodiversity while respecting the ongoing use of such biodiversity by Indigenous Peoples or traditional communities, and compensation to direct users of biodiversity.

32. **Critical Habitats**: no project activity will be implemented in areas of critical habitat[5] unless the following requirements are met:

(i) There are no measurable adverse impacts, or likelihood of such, on the critical habitat, which could impair its high biodiversity value or the ability to function.

(ii) The project is not anticipated to lead to a reduction in the population of any recognized endangered or critically endangered species[6] or a loss in area of the

[3] Land and water areas where the biological communities are formed largely by native plant and animal species, and where human activity has not essentially modified the area's primary ecological functions.

[4] Significant conversion or degradation is (i) the elimination or severe diminution of the integrity of a habitat caused by a major, long-term change in land or water use; or (ii) the modification of a habitat that substantially reduces the habitat's ability to maintain viable populations of its native species. Significant conversion may include, for example, land clearing; replacement of natural vegetation (for example, by crops or tree plantations); permanent flooding (by a reservoir for instance); drainage, dredging, filling, or canalization of wetlands; or surface mining.

[5] Critical habitat is a subset of both natural and modified habitat that deserves particular attention. Critical habitat includes areas with high biodiversity value, including habitat required for the survival of critically endangered or endangered species; areas having special significance for endemic or restricted-range species; sites that are critical for the survival of migratory species; areas supporting globally significant concentrations or numbers of individuals of congregatory species; areas with unique assemblages of species or that are associated with key evolutionary processes or provide key ecosystem services; and areas having biodiversity of significant social, economic, or cultural importance to local communities. Critical habitats include those areas either legally protected or officially proposed for protection, such as areas that meet the criteria of the Word Conservation Union classification, the Ramsar List of Wetlands of International Importance, and the United Nations Educational, Scientific, and Cultural Organization's world natural heritage sites.

[6] As defined by the Word Conservation Union's Red List of Threatened Species or as defined in any national legislation.

habitat concerned such that the persistence of a viable and representative host ecosystem be compromised.

(iii) Any lesser impacts are mitigated in accordance with above para on natural habitats.

33. When the project involves activities on a site with critical habitat, the borrower/client will retain qualified and experienced external experts to assist in conducting the assessment.

34. **Legally Protected Areas:** in circumstances where some project activities are located within a legally protected area, in addition to the requirement specified in para on critical habitats above, the borrower/client will meet the following requirements:

(i) Act in a manner consistent with defined protected area management plans.

(ii) Consult protected area sponsors and managers, local communities, and other key stakeholders on the proposed project.

(iii) Implement additional programs, as appropriate, to promote and enhance the conservation aims of the protected area.

5. Institutional Capacity

35. All sub-projects will be supported by ADB and other cofinanciers including private sector development. MoFT, through MEE, FANEKA and STELCO, is responsible for the design and environmental assessment of sub-projects, and monitoring their environmental management during construction and operation. MEE and FENAKA/STELCO staff expertise will be complemented by a network of qualified consultancies that will be utilized to assist in preparing the Project pipeline of sub-projects as required, including sub-project feasibility studies, safeguard assessments, environmental management plans (EMPs) and monitoring reports.

36. FENAKA and STELCO has been working as the implementing agency for various off-grid RE development programs over a number of years, and during this time has developed strong in-house capacity to identify, appraise, supervise installation, monitor operation and report on the types of small RE sub-projects that will be funded under the Project. These agencies follow well-established procedures for feasibility analysis, sub-project design, operation and maintenance. However, it need capacity enhancement in the field of environmental planning and management, including health and safety aspects.

37. Project-facilitated capacity development within PMU and STLECO/FENAKA will focus on managing, implementing and promoting RE development and, at island level, gender equality and social inclusion-based community participation and management of energy systems. Capacity development activities will be implemented through participation in relevant courses and seminars and through “learning-by-doing”, with technical backstopping by FENAKA and STELCO.

D. ANTICIPATED PROJECT IMPACTS AND BENEFITS

38. Individual renewable energy hybrid energy systems (sub-projects) will be classified as ADB environment category B as they involve physical works but are generally expected to have limited, insignificant, and manageable direct and induced adverse environmental and

social impacts. Sub-projects located directly in or within 1 km boundary of protected areas /areas with critical habitats will not be supported by the Project.

39. Overall, the Project is classified as ADB environment category B due to the potential impact of the most significant adverse impact: Solar-Diesel hybrid systems will cause adverse impacts related to construction activities as well as it will also lead to air pollution form new DG sets.

40. All the sub-projects included the Project will be configured as solar-diesel hybrid energy system, which will have limited adverse environmental and social impacts due to the small scale of the plant, location on open ground and on roof-top of public buildings (schools, hospitals, government offices etc.), and limited activities during operation. Solar PV panels will be installed at new locations either on ground mounted or on rooftop of public buildings, which will be confirmed during the project preparation. The area (plots) required for the solar PV installations will be in the range 300 sq.m to 15000 sq.m for a PV plant ranging between 20 kWp to 1 MWp assuming that solar PV panels would required about 15 sq.m. area to generate 1 kWp electricity. The typical solar panels (approximately 1 sq.m each) would be mounted on 1 m high stands. It will also have a battery storage system called battery bank (commonly 200-300 batteries). The new DG sets would be installed on the exiting powerhouses on each Island. The electricity generated would be directly fed into existing grid managed by STELCO and FENAKA. As part of the Project, inefficient grid assets such as cables, distribution panels, switchgears, etc. would also be replaced to ensure efficient delivery to electricity to the end users.

41. The land for solar PV installations would be mostly government owned land. Sites for ground installations would be selected to avoid loss of trees / vegetation and also to the extent possible this will selected adjacent to the existing powerhouses to avoid construction of new distribution grid and new access roads. No forest will be cleared to install the panels. However trees from surrounding areas may require trimming to avoid shading on the PV panels.

42. Solar PV plant facility construction will take 1-2 months and involve: minor site clearance; excavation of the panel stand footings; transport of equipment to site; concreting footings; installation of the stands, and panels; and refurbishment of the associated electricity mini-grid distribution system. The refurbishment of mini-grid systems will be limited to the replacement of grid assets. The transport of equipment to remote islands will usually be undertaken by vessels and by trucks from the wharfs to the site. Existing wharfs and roads will be used for transport of equipment and material to the Islands. Therefore construction of new wharfs or access roads is not envisaged as part of this Project. Construction camps will not be required due to the small scale of installations, short construction period and use of local labor. Operation phase activities will be limited to minor maintenance (e.g. cleaning solar panels, gird cables and electrical equipment) and the replacement of used batteries every eight years or so.

43. Typical potential adverse impacts of solar-diesel hybrid system sub-projects, and the main management measures that will be implemented to avoid or mitigate these impacts, are:

2.1 Impacts associated with pre-construction activities

44. The location of sub-project sites for ground mounted solar PV installations will be moslty on open plots free from any encroachments but may have covered by thin vegetation. Roof-top installations will be mostly done on selected public buildings. The project facilities will not encroach any of the environmentally sensitive areas. Also there will be no sites of any archaeological importance in and around the project facilities. DG sets will be installed in exisiting powerhouses and grid assets will be replaced mostly on existing grid system. Therefore impacts associated with project siting on physical environment will be negligible.

45. Minor impacts on topography and visual impacts are expected due to installation of the solar panels. However these impacts are permanent and these impacts were minimized by careful site selection to avoid inhabited areas.

46. The equipments to be procured and installed by the Project will comply with international standards for noise as well as escape of polluting materials. The new diesel generators will be designed to comply with World Bank's EHS guidelines for small combustion facilities and World Bank's EHS guidelines for ambient noise both for day time and night time.

47. Storage and handling of fuel, oil residue storgae and lubricating oil storage will be an issue as the current practices at power plants are inadequate. As part of installations of new deisel generating capacity, these practices need to be improved. FENAKA and STELCO will prepare and implement a plan for fuel and oil storage and handling at powerhouses. This will include (i) improvements to the existing bunded structure at the fuel storage tanks so that it will be protected from rain and will store spilt or leaked fuel for pump-out and proper disposal; (ii) redesign and construction of the existing oil-separator; and (iii) construction of a bunded concrete area for the storage of empty lubricant oil drums. Additionally, work practices and site environmental management needs to match and this requirement to ensure that no fuel, oil or other lubricant is allowed to enter the external environment.

48. The Project will use transformers of forced-oil and forced-air-cool designs, which do not use polychlorinated biphenyl (PCB). Therefore, there will be no PCB disposal problem from new transformers. As far as possible the Project will not replace old tranformers containing PCB. However in case replaced transformers need raplacement, they will be send to authorized dealers for safe handling, treatment and ultimate disposal.

49. The project will provide solar PV plants with resilience to climate change through compact and preassembled systems resistant to marine environment.

50. The project may need cutting/trimming of few trees (<10 trees in each of subproject) from the proposed sites. The loss of trees will be compensated by planting additional trees as per government requirements. The proposed subprojects will not be located in any protected areas, therefore there will not be any impacts of the fauna due to subprojects.

51. The proposed solar PV installations will require a land area in the range of 300 - 15000 sq.m. depending on the size of the sub-project. The land for ground mounted solar PV installation will be done moslty on government/island council owned land and it will be transferred to the Project as per national regulations. To ensure the livelihood of affected people due to loss of crops, roof area etc. there is possibility that the affected people will be employed by the project. Since project will be implemented on government land, there will be no relocation issue.

2.2 Impacts associated with construction/installation activities

52. Impacts on topography due to installation of solar plant on ground and roof-top of public buidlings will be insignificant. The PV panel will be visible on ground for solar plant and individual buildings. This small change in topography will be visible in the habitation. This change will be permanent. Visual impacts are anticipated due to storage and haulage construction material and movement of equipments and machineries. This will be minimized by the selection of suitable storage areas for materials or plant with minimum visibility from residences and roads with screening where necessary.

53. Impacts on water resources are not anticipated as the sub-project sites will be located away from the water bodies. Domestic wastewater generated from temporary workers sites (10 cubic meters per day) during construction will be managed by constructing temporary soak pits. These soak pits will be closed once constrcution activities are completed.

54. The sub-projects will involve only minor civil works such as clearing of site, earth work and foundation for solar panels. Mechanical and electrical works will take place at various locations within a large sub-project sites. The site preparation will involve only minor leveling, and thus will not significantly change the drainage pattern. The transportation of construction materials and project equipment will require about 10 truck trips per day during the working period of 8 hours. It will mean there is more traffic, particularly heavy traffic, on the road than usual. The distance from the wharf to the proposed sites is generally short so few roads will be affected by this. Traffic level will return to normal after the construction of the solar plant is completed.

55. Noise impact could be an issue during constrcution due to movement of veihcles and machineries, and constrcution activities. Some of the sub-projects with solar PV installations will be located near sentitive receptors i.e. hospotals, schools, office buildings etc. Typical solar PV installation would take about 8-10 days time. Operation of machinery generating high levels of noise solar panel installations will be restricted to between 6:00 am and 10:00 pm in areas where there are nearby residences. Solar panel installations at schools and colleges should be scheduled to avoid class disturbance. Since there are no vacant periods at the hospital, installation of solar panels should be scheduled during the busy periods of the day, avoiding early mornings and evenings.

56. The construction will require not more than 30 workers, who will reside outside the sub-project sites. No groundwater will be tapped at the sub-project sites as these sites have low groundwater potential. The water required for construction (concrete mixing) and consumption will be brought in from outside sources. About 2-3 new moblie toilets will be used for constrcution workers. Domestic wastewater generated by the construction workers would not be more than 10 cubic meters per day per site and will be treated in a small centralized package treatment plant.

57. The nature of the construction works indicates that no toxic or hazardous materials will be used, apart from fuel oils for vehicles, which will be properly stored. Construction wastes will be sorted out by the contractors for recycling. The residual wastes will be properly handled by the relevant island council units for waste disposal.

2.3 Impacts associated with operation and decommissioning

58. Operation of the solar power plant will have negligible environmental impacts during operation. There will be no waste products, no requirements for cooling, no moving parts, no noise, and no impact on flora and fauna.

59. The possible impact could be visual with the addition of the solar panel arrays on the sites, including the possibility of some glare from the panels, even though they are designed to absorb the incident solar radiation. The arrays will be less than 3 m high at their peak, and will be on a fixed 20 degree angle facing due north. The sites for the arrays will be kept away from the residential areas in case of ground installations, therefore impacts from glare and the visual impact from the proposed solar power plants will be insignificant.

60. The water to be used for washing of the solar panels will be taken from outside sources. Provision of adequate drainage facilities will control impacts due to wastewater generated by washing of solar panels.

61. Maldivian islands are vulnerable to the tropical cyclones and hurricanes. To mitigate these impacts, the foundations and racking system will be designed to withstand powerful cyclones and hurricanes, which will limit the probability of generation unavailability as well as reducing any potential hazard of panels being lifted up and blown onto adjacent properties.

During operation phase batteries of solar system will have to be replaced after 7-8 years. These batteries may contains heavy metal and sulphuric acid. If the batteries are discarded in the surroundings then there will be soil contamination as well as marine pollution with lead and sulphuric acid in the land area or in the sea. To mitigate these impacts use of long life lithium-ion batteries with more charge-recharge cycyle are proposed for the Project. Also the replaced batteries will be stored in leak proof battery collection system and will be sent to authorised handlers (in India and Sri Lanka) / manufacturers for recycling and further management. As discussed with the EPA, there are no authorized dealers in Maldives for handling of used batteries. The handiling, storage and disposal of used batteries shall be done in compliance with Waste Management Policy and Waste Regulations (2013) of Maldives as well as in compliance with Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal (1989).

62. Although diesel generators will be placed inside existing powerhouses and also senstive receptors are atleast 100m away from existing powerhouses; noise and air pollution from operation of DG sets could be an issue during operation. To minimise these impacts, the Project will installed gensets which comply with international standards for noise as well as escape of polluting materials. The new diesel generators will be designed to comply with World Bank's EHS guidelines for small combustion facilities and World Bank's EHS guidelines for ambient noise both for day time and night time. The new diesel genset installation will include an on-line continuous exhaust gas analysing function, which will monitor the levels of NOx, SO_2 and PM levels. This will enable operational monitoring in line with the EHS recommended approach for engines.

63. Issues of safe handing, storage and disposal of fuel, oil residue and lubricating oil will be an issue during operation phase. It will be corrected as part of the installation of the new generation capacity. As identified above FENAKA and STELCO will prepare and implement a plan for fuel and oil storage and handling.

64. Impacts on fauna species due to project activities are not envisaged Wastewater generated from cleaning of solar panels will be collected for sediment removal before discharging to the water bodies, therefore impact on aquatic life is not expected.

65. Contractors' emergency response plan including occupational health and safety plan approved by supervision consultant will be adopted to handle emergency situation during the operation period. Workers will be trained to deal with the emergency situations.

66. The Project's solar PV panels are expected to have an economic life of 25 years. The suppliers will accept the decommissioned solar PV panels for recycling based on the thin-film technologies and their update. Dismantling of the PV panels will be handled by suppliers that offer the best price for used PV panels in the future. As part of procurement procedures, EA will ensure that supplier has environmental friendly system in place for safe disposal/ management of used batteries.

67. The impacts associate with refurbishment of mini-grids would be insignificant as the scope of upgrade would include only replacement of the grid assets such as distribution panels, cables/wires, switchgears etc.

2.4 Typical Sub-project Benefits

68. Project environmental and socio-economic benefits are expected to far outweigh the Project's adverse impacts given the number of households, community facilities, service institutions and businesses that will be powered, against the relatively minor construction and operation impacts of the proposed solar PV plants and associated facilities.

69. The successful implementation of the 61058 kW of clean energy by direct fuel efficiency or adding energy to the grid from renewable (solar) in about 160 outer islands of Maldives, as part of POISED Project will result in reduction of annual diesel import for power generation equivalent to US$ 182.92 millions over the project life span of 25 years. This will allow over 30000 households in 160 islands will be supplied with electricity generated from fuel efficient and renewable sources, out of them at least 30 percent households are headed by women. Besides this, schools, hospitals, offices and mosques will also be benefited from the Project.

70. This project directly implements ADB's climate change strategic priority for expanding the use of clean and renewable energy. Maldivian Island's dependency on fossil fuel for energy is total, and therefore very high when compared with global figures. The high dependence on fossil fuels also provides opportunities for significant reductions in greenhouse gas emissions wherever fuel efficiencies and renewable sources of electricity can be brought on-line.

71. The subprojects in over 160 islands all reduce fossil fuel demand either by direct fuel efficiency or adding energy to the grid from renewable (non fossil fuel) sources. The saved fuel has been calculated as net savings in emissions, and these amounts are listed in Table 3.

Table 3: Summary of Emission Reductions with proposed Interventions

Target Island	Level of RE penetration (%)	Savings in Diesel Cost over the life span of Project (million US$)	CO_2 Emission Reduction (t/year)
On 5 priority islands	Unto 35.0	30.32	7160
On 160 islands	Unto 25.6%	182.92	123184

Source: PPTA Consultant Assessment (Details estimate are available in Feasibility Study of the individual Island, presented in Road Map).

72. In can be seen from the table that the total savings in fuel cost (US$ 182.92 millions over the project life span of 25 years) is substantial and will result in not only GHG emission reduction (123184 ton of CO_2-e per year), but it will also prevent associated pollutants from combustion of fossil fuels entering the regional airshed.

73. In addition, a key element of the project will be capacity building including strengthening of staff from FENAKA/STELCO in the areas of O&M of solar-diesel hybrid energy systems. The Project will also bring positive impacts by reducing gaseous emissions (CO_2) from running of existing DG sets; reduction in noise from DG sets operations, reduction in land and ground water contaminations caused by spill of oil from DG sets. Overall, at a local level the Project will improve socio-economic conditions of the local communities in the targeted areas and at a national level will help improve the national Grass Domestic Product (GDP).

2.5 Cumulative Impacts

74. The Project's contribution to significant cumulative biophysical and socioeconomic impacts that are occurring from the range of activities and developments in a defined geographic area/island/atoll will be insignificant due to the small scale and remote locations of sub-projects under the POISED Project.

E. ENVIRONMENTAL ASSESSMENT AND SUB-PROJECT SCREENING

75. The environmental assessment of the overall Project and individual sub-projects has to be undertaken in accordance with ABD SPS requirements as well as Maldivian regulatory framework (Act No 4/93 and EIA Regulations 2012). Assessment will involve (i) assessing the overall Project in an IEE, (ii) screening potential sub-projects against environmental and social criteria, and (iii) preparing an environmental assessment for each selected sub-project that was not assessed as a sample subproject in the Project IEE.

1. Project IEE

76. An IEE is being prepared for the overall Project by the Project Preparatory Technical Assistance (PPTA) consultants on behalf of and in close collaboration with MEE. The Project IEE is a component of ADB's due diligence review. The overall Project has been classified as ADB environment category B based on the likely RE sub-project types, installed capacity, and locations of these developments, as determined by the Project's most environmentally sensitive component: solar-diesel hybrid system sub-projects. All sub-projects will be environment category B projects. Accordingly, the project IEE is being prepared in accordance with ADB's SPS (2009) requirements for sector lending, with the main objectives being to:

(i) provide an environmental and social baseline description of the Project;

(ii) identify and describe the Project's potential environmental and social impacts;

(iii) design mitigation measures to minimize adverse impacts;

(iv) describe the Project's public consultation process and Grievance Redress Mechanism (GRM); and

(v) provide Environmental Management and Monitoring Plans for the overall Project (including defining institutional responsibilities, capacity building and training plans, and budgeting).

77. The Project IEE is based on the assessment of five demonstration sub-projects. These sample sub-projects were selected to represent the range of sub-project types (solar-diesel hybrid system) and different physiographic regions where they are likely to be installed. The sub-project assessments provide a good indication of the types and significance of the likely adverse impacts and benefits of the overall Project and of the adverse impacts and benefits of each of the RE sub-project types.

2. Sub-Project Screening

78. MEE with the help of FENAKA and STELCO will undertake necessary field visits and consultations to screen the individual sub-projects against (i) sub-project selection criteria (Appendix B), and (ii) potential environmental and social impacts. All the sub-projects included in the Project are Solar-Diesel hybrid system and ADB environment categories of these sub-projects are expected to be Category B as they involve physical construction as well as operational impacts.

79. All solar-diesel hybrid system sub-projects will be screened using ADB's *Rapid Environmental Assessment* (REA) *Checklist* for Solar Energy, Thermal Power Plants as well as for electricity transmission and distribution, those have been adapted to five sample sub-projects (Appendix 3), to determine the environment category and identify the main adverse impacts.

80. Sub-projects that will not be supported by the Project include: (i) any sub-project assessed as category A; (ii) sub-projects directly located in or within 1 km boundary of areas of biologically sensitivity or with significant habitat (e.g. on a site with endangered flora or fauna); (iii) sub-projects in legally protected areas where the proposed development is not permitted under GoM legislation; (iv) sub-projects within protected historical or cultural heritage sites; and sub-projects with the type of activities listed in ADB SPS 2009 Appendix 5 (ADB Prohibited Investment Activities List).

3. Sub-Project Environmental Assessment

81. PMC consultants will prepare an IEE for each category B sub-project in consultation with participating island councils and other stakeholders, following EPA procedures. The IEE will be consistent with the outline and content contained in ADB SPS 2009. The content of the sub-project IEE is outlined in Appendix 4. The level of detail and comprehensiveness of each sub-project IEE will be commensurate with the significance of the potential impacts and risks.[7] The five solar-diesel hybrid system sub-project assessments contained in the Project IEE provide a good indication of the type of information and level of detail required in each sub-project IEE, including the measures to be proposed in the EMP incorporated in each IEE. Management measures proposed in the EMP shall be incorporated into as conditions into construction contractor bidding documents.

82. In case of replacement of DG sets in the existing power plants, a due diligence needs to be carried out at those power plants in compliance with ADB's SPS requirements.

4. Project and Sub-Project Review

83. ADB will review the Project IEE that covers five sample sub-projects. After grant approval, MEE with the support from PMC consultant and FENAKA/STELCO will prepare the environmental assessments for subsequent sub-projects and ADB will review and approve the IEEs for subsequent subprojects.

F. CONSULTATION, INFORMATION DISCLOSURE, AND GRIEVANCE REDRESS MECHANISM

1.1 Consultation and Information Disclosure

84. ADB's SPS (2009) requires projects to carry out meaningful public consultation on an ongoing basis. Public consultation will: (i) begin early and carry on throughout the project cycle; (ii) provide timely disclosure of relevant information, understandable and accessible to people; (iii) ensure a free and un-intimidated atmosphere without coercion; (iv) ensure gender inclusiveness tailored to the needs of disadvantaged and vulnerable groups; and (v) enable the incorporation of all relevant views of affected people, and stakeholders into project decision making, mitigation measures, the sharing of development benefits and opportunities and implementation issues. The PMU and any appointed environmental assessment consultants will be open to contact/consultation by the public on environmental assessment matters during sub-project IEE preparation and design investigations.

85. All communication handouts shall be written in Dahevi and all consultations will be documented. All relevant views raised during consultation shall be reported in the environmental assessment report, and considered in sub-project design and reflected in the

[7] ADB SPS (2009); OM Section F1/OP, paragraph 7, page 2, 4 March 2010.

environmental management plan as appropriate. Attendance sheets and notes of consultations shall be included in the environmental assessment report as proof that consultation/s had been held.

86. Information disclosure will follow the procedure for ADB environment category B project. It is the policy of the ADB to have environmental assessment reports made available/accessible to the general public. The following environmental assessment-related documents will be posted on the ADB website: i) draft EARF, before Project appraisal; ii) Final or updated EARF, upon receipt; iii) overall project IEE report and EMP. Hard copies of the EARF and IEE reports (in English and Dahevi) will be made available for perusal at the ADB Office, at MEE head office in Male, at FENAKA/STELCO island offices, at Island council offices in each Islands and at other locations accessible to stakeholders (to be determined by the EA). If the IEE for the subprojects is prepared after board approval, it will be disclosed on the ADB website in due course.

1.2 Grievance Redress Mechanism

87. A grievance redress mechanism (GRM) will be established to receive and facilitate the resolution of affected persons (AP) concerns, complaints, and grievances on project implementation and operational issues, including negotiated/voluntary land donation, relocation, income restoration, environmental management and other construction and operation related issues. The GRM will be designed to be proactive and accessible to all APs to address their concerns grievances and issues effectively and swiftly, in accordance with ADB SPS (2009). Island councils will inform the community about the GRM during the first stage of community mobilization. The GRM is based on seven consecutive levels of action aimed at resolving issues as soon as possible and within a set time frame, as described below.

88. The IA's project management unit (PMU) will have a designated staff member to address all potential complaints from the public for both construction and operation phases of the project. Any complaint will be recorded and investigated by the PMU working with the construction and operations managers (as appropriate) of the individual project components. A complaints register will be maintained which will show the details and nature of the complaint, the complainant, the date and actions taken as a result of the investigation. It will also cross-reference any noncompliance report and/or corrective action report or other relevant documentation.

89. When construction starts, a sign will be erected at all sites providing the public with updated project information and summarizing the grievance redress mechanism process including contact person details at the PMU. All corrective actions and complaints responses carried out on site will be reported back to the PMU. The PMU will include the complaints register and corrective actions/responses in its progress reports to the ADB.

90. In the whole progress, the Maldives national agencies (EPA for environment related grievances and Ministry of Justice (MoJ) for Social/Resettlement related grievances) will be always available to public complaints and advice on the PMU's performance for grievance redress.

91. On receipt of a complaint in any form (in person, telephone, written) the PMU complaints officer will log the details in a complaints register. PMU will forward complaint to the contractor/construction manager/operations manager (as appropriate) within 48 hours. The contractor or managers will respond to the PMU within 1 week with advice on corrective actions taken or put in train. PMU will review and find solution to the problem in consultation with island/village chief and relevant local agencies. Then PMU will report back to the village/island chief and affected persons within a week time. If the complainant is dissatisfied

with the outcome, or have received no advice in the allotted time period, he or she can take grievance to Island Council. Island Council will refer matter to the relevant national agencies (EPA, MoJ). National agency refers to an internal committee and reports back to AP/village chief about outcome. If unresolved or at any time if complainants is not satisfied, he or she can take the matter to appropriate court. Both successfully addressed complaints and non-responsive issues will be reported to the ADB by the PMU.

92. Table 4 presents the steps and corresponding time frame for proposed grievance redress mechanism. Figure 1 shows the proposed Grievance Redress Mechanism.

Table 4: Grievance Redress Process

Stage	Process	Duration
1	Affected Person (AP)/village elected chief takes grievance to PMU	Any time
2	PMU review and find solution to the problem in consultation with village chief and relevant agencies	2 weeks
3	PMU reports back to village chief/AP	1 week
If unresolved		
4	AP/village chief take grievance to Island Council	Within 2 weeks of receipt of decision in step 3
5	Island Council refers matter to relevant national agency (NES/CIIC/Ministry of Justice)	2 weeks
6	National agency refers to an internal committee	4 weeks
7	National agency reports back to AP/village chief	1 week
If unresolved or at any stage if AP is not satisfied		
AP/village chief can take the matter to appropriate court		As per judicial system

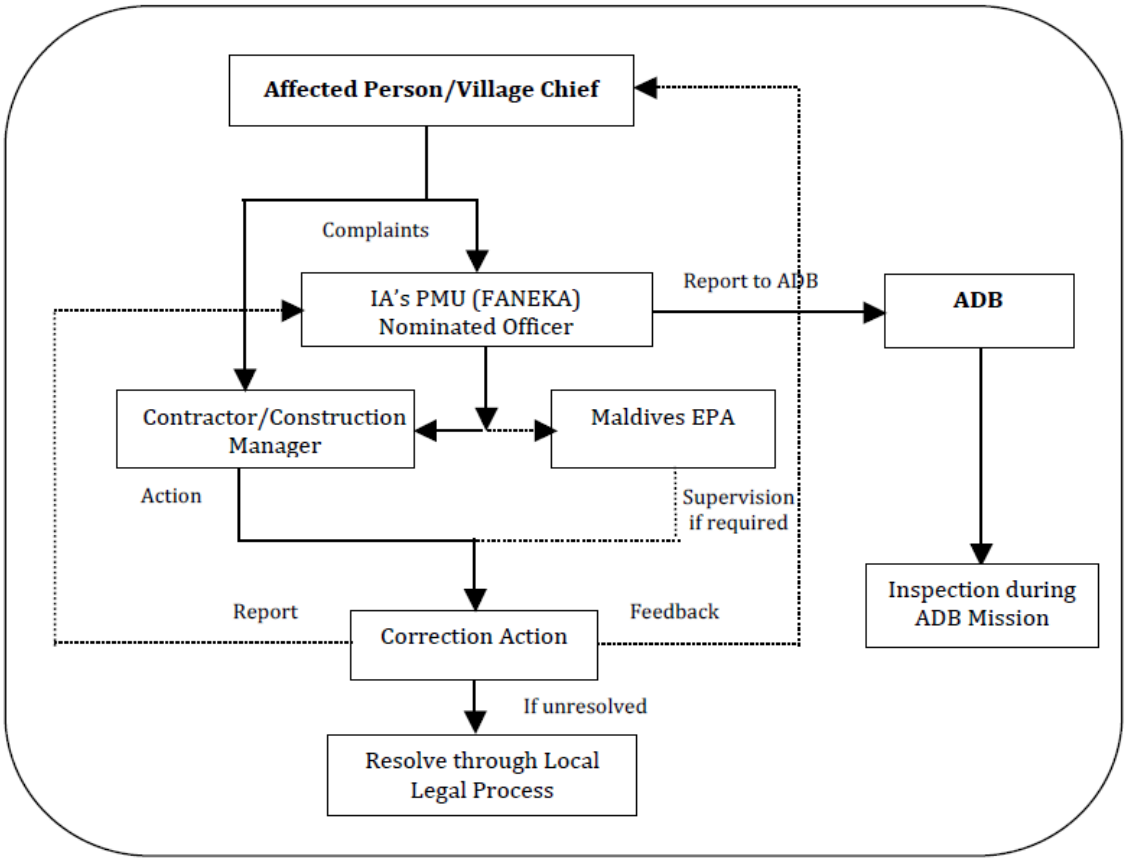

Figure 1: Proposed Grievance Redress Mechanism

G. INSTITUTIONAL ARRANGEMENT AND RESPONSIBILITIES

93. The main institutions that will be involved in environmental management activities are the Ministry of Finance and Treasury, as the executing agency, the Ministry of Environment and Energy (MEE), FENAKA and STELCO as implementing agencies (IAs) of the Project, project management consultant (PMC), EPC contractor(s), and line agencies including the Environment Protection Agency (EPA) and Waste Management Division within EPA. The project management unit (PMU) and project implementation units (PIUs) will for implementing the project.

1. MEE / FENAKA / PMC

94. EA will have overall responsibility for all aspects of the Project. The EA will submit environmental assessment report to EPA or Island Authority, as applicable for review and approval as per the Act No. 4/93 of Maldives. If required EA with support from PMC environmental expert will update sub-project specific IEEs and EMPs to meet the EPA requirements.

95. The EA with support form PMC and IAs will be responsible for overseeing sub-project compliance with environmental and social safeguard requirements based on the EARF provisions that include: (i) sub-project selection taking into account environmental screening criteria; (ii) sub-project environmental assessments prepared in the form of an IEE (category B sub-projects) in accordance with the requirements set out in this EARF; (iii) appropriate public

consultations and disclosures; (iv) effective management of the grievance redress mechanism; and (v) EARF compliance reported in the environmental monitoring report. The EA or its appointed technical consultants will conduct routine visual inspections of construction activities, including site pegging, vegetation clearance, earthworks, etc.

96. EA through support of IAs (MEE/FENAKA/STELCO) and PMC will be responsible for day-to-day management of technical aspects of the project. PMC will be responsible to update EMP followed by design phase and he will also be responsible to approving contractors' management plan, emergency plan, and occupational health and safety plan as well as to ensure on-ground implementation of the environmental management plan. EA with support form PMC will also prepare and submit environmental monitoring reports to ADB. EA will ensure the environmental management and monitoring budgets are available and utilized as necessary for timely implementation of EMP.

97. The existing capacity of IAs (MEE/FENAKA/STELCO) in managing project level environmental aspects needs strengthening to ensure compliance with ADB and Government requirements to implement the Project. It is recommended that PMU will have a safeguard officer in the project organization structure, who will be primarily responsible for ensuring that the EMP is properly implemented. PMC will provide training to EA/IAs staff on managing the environmental issued associated with project. Cost of capacity building is included in the capacity building component of the Project.

98. Efficient project implementation related to the turnkey contract will be provided by the PMC, and will include preparation of bidding documents; assistance during the bidding process; and supervision of the project design, supply, construction, and commissioning. The PMC will have expertise on implementation and supervision of renewable energy hybrid projects.

99. The Contractor(s) will be informed their responsibility to comply with the EMP and the requirements of ADB. There are specific responsibilities for EMP compliance during construction phase that will rest with the Contractor who will be monitored by the staff of the project implementation unit. The Contractor(s) will be required to have one staff with experience in environmental management. This staff will be responsible for preparing plans such as emergency preparedness plan; occupational health and safety plan, day-to-day implementation of EMP.

2. Consultants, Construction Contractors, Equipment Suppliers/ Service Providers

100. Consultants will be contracted by IAs (MEE/FENAKA/STELCO) as required to assist in the preparation of the pipeline of sub-projects. This will include consulting services to complete IEEs for pipeline sub-projects and preparation of site specific EMPs for individual sub-projects.

101. Construction contractors, equipment suppliers, and other service providers will be engaged to install sub-projects. Construction contractors will have primary responsibility for environmental and social management and worker health and safety at sub-project construction sites under their control. They will be required to adhere to MEE/FENAKA's/STELCO's environmental, health, and safety (EHS) guidelines and implement relevant sub-project environmental and social management measures prior to and during construction. This will include implementing controls such as spoil disposal, reconnection of cut services, and revegetation to stabilize sites. They will also be responsible for the provision of appropriate personal protective equipment (e.g., hard hats, safety boots, and hearing protection) to their workers. Equipment suppliers and other service providers are expected to adhere to best EHS management practices consistent with the scope of their activities.

3. Asian Development Bank

102. ADB will (i) review the draft EARF and its subsequent update as necessary; (ii) review the Project IEE prior to ADB Board consideration; (iii) periodically review sample sub-project IEEs and desktop environmental assessments; (iv) review Project monitoring reports; and (v) officially disclose environmental safeguards documents on its web site in accordance with the ADB *Public Communications Policy* (2011). ADB will also review REA Checklists for proposed solar-diesel hybrid system sub-projects to enable it to provide guidance to EA/PMU on SPS (2009) requirements.

4. Staffing Requirements and Budget

103. An environmental expert (intermittent) will be based in PMU to prepare environmental documentation. Consultant support for environmental management and monitoring will be provided to enhance the existing resources. POISED's costs will incorporate a budget and resources needed to (i) implement the environmental review and screening procedure, (ii) undertake the environmental assessment studies for the subprojects, (iii) monitor the implementation of EMMPs, and (iv) undertake environmental mitigation measures as required.

104. A timeframe of 6 person-months is considered sufficient to prepare environmental documentation. A provision has been made for preparing additional reports during implementation if deemed necessary. Sufficient budget funds and resources will be incorporated into POISED to cover costs to (i) implement the environmental review procedures, (ii) conduct IEEs for the pipeline subprojects, (iii) monitor the implementation of the EMPs, and (iv) undertake environmental monitoring by IAs.

105. The cost of conducting training, undertaking monitoring of environmental parameters through recognized agencies (part of civil contract), hiring environmental experts, and implementing the EARF will also be incorporated in POISED.

106. Implementation of the above environmental assessment and review procedures would require the following budget:

Table 5: Tentative Cost Estimates for Implementation of EARF

Item	No. of Units	Per Unit Cost (US$)	Total Cost (US$)
Environmental Expert attached to PMC	1 person x 06 months	6000/month	36000.0
Preparation of IEEs for remaining sub-projects	1 person x 12 months	4000/month	48000.0
Office expenses related to preparation of additional IEEs and EMPs	Lumpsum	25000	25000.0
Provision of travel budget and expenditure of monitoring the implementation of EMMPs	Lumpsum	50000	50000.0
Capacity building program	Lumpsum	25000	25000.0
Travel costs and per diems	60 months	700/month	42,000
Sub-Total	**-**	**-**	**226000.0**
Contingency (10% of total estimated costs)	-	-	22600.0
Total	**-**	**-**	**248600.0**

H. ENVIRONMENTAL MONITORING AND REPORTING

107. The PMU will prepare an overall Project monitoring report every six months during Project implementation and submit this to the ADB. Template of the monitoring report is attached in Appendix 5. The PMU wit support from PIU will also prepare environmental management reports in accordance with the Project IEE and environmental management plan every six months during construction (or at the end of construction when it takes less than six months), and once between 6-12 months after the commencement of sub-project operation. The environmental management reports will cover EMP implementation, focusing on compliance and any needed corrective actions. Public consultation will be conducted as necessary during construction. ADB will conduct periodic review missions, which will include a review of safeguard implementation issues.

APPENDIX 1: INDICATIVE LIST OF SUB-PROJECTS

Sr. No.	Name of Island	Proposed RE System	Diesel (kW)	PV (kW)	Total (KW)	Net Present Cost (US $)
1	Maafilafushi	Solar-Diesel Hybrid System	35	100	135	938,241
2	Fehendhoo	Solar-Diesel Hybrid System	35	80	115	947,956
3	Fulhadhoo	Solar-Diesel Hybrid System	40	125	165	1,491,539
4	Molhadhoo	Solar-Diesel Hybrid System	40	125	165	1,504,049
5	Gaadhoo	Solar-Diesel Hybrid System	40	140	180	1,728,114
6	Magoodhoo	Solar-Diesel Hybrid System	40	130	170	1,510,012
7	Fodhdhoo	Solar-Diesel Hybrid System	40	130	170	1,570,926
8	Vandhoo	Solar-Diesel Hybrid System	40	140	180	1,766,368
9	Hirimaradhoo	Solar-Diesel Hybrid System	40	140	180	1,896,602
10	Noomaraa	Solar-Diesel Hybrid System	40	140	180	1,810,042
11	Kondey	Solar-Diesel Hybrid System	40	20	60	1,717,273
12	Gaadhiffushi	Solar-Diesel Hybrid System	40	20	60	1,794,046
13	Dhonfanu	Solar-Diesel Hybrid System	45	25	70	1,822,674
14	Fainu	Solar-Diesel Hybrid System	45	25	70	275,672
15	Vaadhoo	Solar-Diesel Hybrid System	55	30	85	2,468,487
16	Veyvah	Solar-Diesel Hybrid System	50	26	76	2,019,021
17	Narudhoo	Solar-Diesel Hybrid System	50	24	74	2,071,877
18	Kihaadhoo	Solar-Diesel Hybrid System	72	25	97	2,038,187
19	Kinolhas	Solar-Diesel Hybrid System	55	25	80	2,335,462
20	Rinbudhoo	Solar-Diesel Hybrid System	88	45	133	2,632,028
21	Naalaafushi	Solar-Diesel Hybrid System	55	25	80	2,233,366
22	Kudarikilu	Solar-Diesel Hybrid System	85	60	145	3,438,667
23	Finey	Solar-Diesel Hybrid System	55	35	90	2,580,837
24	Angolhitheemu	Solar-Diesel Hybrid System	45	30	75	2,005,702
25	Bileiyfahi	Solar-Diesel Hybrid System	78	50	128	2,740,706
26	Uligan	Solar-Diesel Hybrid System	83	65	148	3,194,647
27	Vashafaru	Solar-Diesel Hybrid System	127	45	172	2,601,192
28	Omadhoo	Solar-Diesel Hybrid System	70	50	120	2,740,401
29	Dhiyamigili	Solar-Diesel Hybrid System	70	55	125	2,714,063
30	Muraidhoo	Solar-Diesel Hybrid System	96	55	151	2,782,543
31	Maarandhoo	Solar-Diesel Hybrid System	80	55	135	3,170,145
32	Thakandhoo	Solar-Diesel Hybrid System	70	45	115	2,799,787
33	Olhuvelifushi	Solar-Diesel Hybrid System	80	60	140	3,202,793
34	Rasmaadhoo	Solar-Diesel Hybrid System	170	65	235	3,151,834
35	Naivaadhoo	Solar-Diesel Hybrid System	80	50	130	3,130,933
36	Filladhoo	Solar-Diesel Hybrid System	80	65	145	3,641,098
37	Thuraakunu	Solar-Diesel Hybrid System	80	65	145	3,400,188
38	Buruni	Solar-Diesel Hybrid System	100	100	200	3,868,443
39	Kurinbi	Solar-Diesel Hybrid System	80	60	140	2,757,491
40	Henbadhoo	Solar-Diesel Hybrid System	85	70	155	3,564,948
41	Kanduhulhudhoo	Solar-Diesel Hybrid System	203	70	273	4,018,318
42	Dharanboodhoo	Solar-Diesel Hybrid System	85	90	175	3,388,634
43	Maalhos	Solar-Diesel Hybrid System	85	70	155	3,684,248
44	Kandoodhoo	Solar-Diesel Hybrid System	85	70	155	3,740,305
45	Lhohi	Solar-Diesel Hybrid System	90	80	170	3,788,504
46	Kunahandhoo	Solar-Diesel Hybrid System	95	80	175	3,780,727
47	Kamadhoo	Solar-Diesel Hybrid System	95	80	175	3,934,203
48	Maaenboodhoo	Solar-Diesel Hybrid System	120	90	210	4,520,896
49	Maakurathu	Solar-Diesel Hybrid System	100	80	180	4,346,227
50	Kudafari	Solar-Diesel Hybrid System	100	80	180	4,079,599
51	Innamaadhoo	Solar-Diesel Hybrid System	100	80	180	4,225,254
52	Utheemu	Solar-Diesel Hybrid System	110	80	190	3,939,705
53	Nadellaa	Solar-Diesel Hybrid System	120	80	200	4,736,515
54	Dhanbidhoo	Solar-Diesel Hybrid System	100	90	190	4,407,026
55	Maroshi	Solar-Diesel Hybrid System	100	90	190	4,228,164
56	Bandidhoo	Solar-Diesel Hybrid System	120	90	210	5,285,635

Sr. No.	Name of Island	Proposed RE System	Diesel (kW)	PV (kW)	Total (KW)	Net Present Cost (US $)
57	Maafaru	Solar-Diesel Hybrid System	110	90	200	4,627,004
58	Maalhendhoo	Solar-Diesel Hybrid System	120	90	210	4,651,746
59	Dhevvadhoo	Solar-Diesel Hybrid System	140	100	240	4,407,026
60	Rasgetheemu	Solar-Diesel Hybrid System	110	60	170	3,997,042
61	Landhoo	Solar-Diesel Hybrid System	110	100	210	4,722,106
62	Kinbidhoo	Solar-Diesel Hybrid System	110	100	210	4,758,788
63	Rathafandhoo	Solar-Diesel Hybrid System	120	100	220	4,817,063
64	Lhaimagu	Solar-Diesel Hybrid System	230	100	330	4,557,817
65	Feevah	Solar-Diesel Hybrid System	120	100	220	5,027,932
66	Maaungoodhoo	Solar-Diesel Hybrid System	120	100	220	4,962,775
67	Hulhudheli	Solar-Diesel Hybrid System	130	100	230	4,970,537
68	Hithaadhoo	Solar-Diesel Hybrid System	130	100	230	5,068,927
69	Hithadhoo	Solar-Diesel Hybrid System	130	100	230	5,110,721
70	Kumundhoo	Solar-Diesel Hybrid System	130	100	230	5,142,607
71	Neykurendhoo	Solar-Diesel Hybrid System	206	120	326	5,195,862
72	Nellaidhoo	Solar-Diesel Hybrid System	210	110	320	5,481,091
73	Feydhoo	Solar-Diesel Hybrid System	240	100	340	5,378,322
74	Gan-Thundi	Solar-Diesel Hybrid System	140	110	250	5,640,902
75	Vaadhoo	Solar-Diesel Hybrid System	150	120	270	5,961,624
76	Gan-Mukurimagu	Solar-Diesel Hybrid System	150	120	270	6,014,352
77	Kendhoo	Solar-Diesel Hybrid System	150	120	270	6,093,374
78	Madifushi	Solar-Diesel Hybrid System	150	110	260	5,640,066
79	Hoandedhdhoo	Solar-Diesel Hybrid System	150	110	260	6,088,278
80	Madavli	Solar-Diesel Hybrid System	150	120	270	6,244,923
81	Faresmaathodaa	Solar-Diesel Hybrid System	150	130	280	6,410,879
82	Goidhoo	Solar-Diesel Hybrid System	160	200	360	5,622,497
83	Isdhoo Dhekunu	Solar-Diesel Hybrid System	150	110	260	6,402,116
84	Isdhoo Uthuru	Solar-Diesel Hybrid System	150	110	260	6,441,292
85	Miladhoo	Solar-Diesel Hybrid System	255	100	355	6,554,065
86	Dharavandhoo	Solar-Diesel Hybrid System	160	120	280	7,067,661
87	Baarah	Solar-Diesel Hybrid System	140	120	260	6,525,130
88	Fiyoaree	Solar-Diesel Hybrid System	180	70	250	5,121,391
89	Nolhivaranfaru	Solar-Diesel Hybrid System	250	120	370	7,007,041
90	Nolhivaran	Solar-Diesel Hybrid System	220	160	380	8,393,247
91	Inguraidhoo	Solar-Diesel Hybrid System	200	160	360	7,790,691
92	Hulhudhuffaaru	Solar-Diesel Hybrid System	200	160	360	8,530,695
93	Maduvvari	Solar-Diesel Hybrid System	200	160	360	7,883,517
94	Makunudhoo	Solar-Diesel Hybrid System	160	120	280	6,612,746
95	Foakaidhoo	Solar-Diesel Hybrid System	200	160	360	8,163,746
96	Vilufushi	Solar-Diesel Hybrid System	230	200	430	9,833,241
97	Gan-Maahina	Solar-Diesel Hybrid System	190	160	350	8,106,578
98	Maamendhoo	Solar-Diesel Hybrid System	325	160	485	7,748,191
99	Dhaandhoo	Solar-Diesel Hybrid System	576	190	766	9,074,877
100	Hirilandhoo	Solar-Diesel Hybrid System	270	140	410	8,912,140
101	Kanditheemu	Solar-Diesel Hybrid System	466	160	626	8,771,132
102	Kolamaafushi	Solar-Diesel Hybrid System	466	160	626	8,771,132
103	Meedhoo	Solar-Diesel Hybrid System	345	160	505	8,684,117
104	Gemanafushi	Solar-Diesel Hybrid System	310	170	480	8,889,500
105	Kendhikulhudhoo	Solar-Diesel Hybrid System	220	180	400	8,952,433
106	Dhiggaru	Solar-Diesel Hybrid System	180	148	328	6,984,457
107	Kurendhoo	Solar-Diesel Hybrid System	254	300	554	8,311,939
108	Mulah	Solar-Diesel Hybrid System	220	180	400	9,127,801
109	Kelaa	Solar-Diesel Hybrid System	230	150	380	8,481,531
110	Komandhoo	Solar-Diesel Hybrid System	250	60	310	10,604,999
111	Maavah	Solar-Diesel Hybrid System	250	200	450	10,099,853
112	Guraidhoo	Solar-Diesel Hybrid System	250	200	450	10,176,758
113	Milandhoo	Solar-Diesel Hybrid System	320	280	600	12,952,776
114	Thimarafushi	Solar-Diesel Hybrid System	300	220	520	11,787,693

Sr. No.	Name of Island	Proposed RE System	Diesel (kW)	PV (kW)	Total (KW)	Net Present Cost (US $)
115	Alifushi	Solar-Diesel Hybrid System	300	220	520	11,937,253
116	Thulhaadhoo	Solar-Diesel Hybrid System	300	240	540	12,112,745
117	Manadhoo	Solar-Diesel Hybrid System	320	250	570	12,753,181
118	Gan-Mathimaradhoo	Solar-Diesel Hybrid System	320	250	570	13,086,230
119	Holhudhoo	Solar-Diesel Hybrid System	380	280	660	13,674,934
120	Ihavandhoo	Solar-Diesel Hybrid System	570	300	870	14,971,131
121	Gadhdhoo	Solar-Diesel Hybrid System	400	320	720	14,971,131
122	Hoarafushi	Solar-Diesel Hybrid System	400	300	700	16,081,037
123	Velidhoo	Solar-Diesel Hybrid System	430	320	750	17,004,915
124	Hanimaadhoo	Solar-Diesel Hybrid System	410	320	730	17,673,275
125	Mahibadhoo	Solar-Diesel Hybrid System	460	100	560	19,644,603
126	Dhuvaafaru	Solar-Diesel Hybrid System	530	320	850	17,796,294
127	Kudahuvadhoo	Solar-Diesel Hybrid System	650	400	1,050	25,177,855
128	Fonadhoo	Solar-Diesel Hybrid System	600	400	1,000	21,909,720
129	Eydhafushi	Solar-Diesel Hybrid System	630	200	830	25,284,421
130	Dhidhdhoo	Solar-Diesel Hybrid System	650	300	950	25,807,954
131	Hinnavaru	Solar-Diesel Hybrid System	610	400	1,010	23,994,499
132	Hulumeedhoo	Solar-Diesel Hybrid System	730	450	1,180	27,481,960
133	Villingili	Solar-Diesel Hybrid System	800	300	1,100	32,315,999
134	Naifaru	Solar-Diesel Hybrid System	950	600	1,550	35,635,757
135	Thinadhoo	Solar-Diesel Hybrid System	2,320	300	2,620	64,678,518
136	Fuvahmulah	Solar-Diesel Hybrid System	2,120	450	2,570	84,674,826
137	Kulhudhuffushi	Solar-Diesel Hybrid System	2,200	450	2,650	76,115,840
138	Addu City	Solar-Diesel Hybrid System	6,850	1,600	8,450	242,557,803
		Total	40,170	20,888	61,058	1,432,862,949

Note: As of now about 138 islands are identified by EA. Remaining Islands will be identified in the subsequent stages as the project process.

APPENDIX 2: TERMS OF REFERENCE FOR ENVIRONMENTAL CONSULTANT

The Environmental Safeguards Specialist should (i) have a postgraduate degree in environmental science, environmental engineering, environmental management, or in any relevant field; (ii) have at least 10 years of working experience; (iii) have experience in energy sector including renewable energy projects; and (iv) be fluent in English. The expert with experience in the region and or in Maldives will be an advantage. The expert will undertake the following activities:

- Review all document relevant to the proposed project, including relevant national laws and regulations and a national EIA report.
- Conduct site visit and primary data collection, if necessary, to evaluate environmental impacts of the proposed project.
- Assist the IAs in project categorization by preparing rapid environmental assessment (REA) checklist for the selected project sites
- Submit REA to ADB, incorporate all the comments from ADB, revise and resubmit the REA for ADB approval
- Prepare an initial environmental examination (IEE) report of the proposed project and ensure the report meets ADB's Safeguard Policy Statement (2009) requirements.
- Assess the capacity of the executing agency and implementing agency on environmental assessment, management, and monitoring; and recommend required measures for capacity building.
- Identify areas for improvement and training needs with respect to the environmental safeguards under the project and based on this, prepare and submit training materials and conduct the training workshop to the staff of the executing agency, implementing agency and other stakeholders on environmental management and safeguard compliance.
- Identify environmental risks and propose a set of mitigating measures during the project construction and operation.
- Assist the executing and implementing agencies in preparing a sound environment management plan (EMP), appropriate monitoring requirements to assess the environmental and social impact of the project construction and operation, and establish a grievance redress mechanism.
- Review cost implications of the proposed environmental mitigation measures and implementation of the EMP.
- Prepare a list of activities and budget requirements for EMP monitoring during project implementation.
- Assist the executing agency and implementing agency in stakeholders participation and consultation during IEE preparation and disclosure of relevant information.
- Establish environmental baseline indicators and performance targets.
- Submit the English IEE report to ADB and incorporate ADB's comments on the IEE report, revise, update and/or refine the IEE, if required.
- Prepare and submit a template of EMP monitoring report both in English and Dhivehi.
- Provide a clear guidance on how to prepare environmental monitoring (EMP monitoring) reports to the executing agency and implementing agency, so that they are comfortable to diligently fulfill the monitoring requirement throughout the project implementation.
- Monitor the implementation of EMP during construction and operation of the project.
- Carry out environmental monitoring for the project, including sampling, spot checks, and regular inspection.
- Prepare, submit environmental monitoring (EMP monitoring) reports to the executing agency of the project and ADB, and incorporate all the comments from ADB. Liaise with the PMU and ADB and facilitate communications between them.
- Plan, organize, and conduct environmental training to the PMU and the executing agency on the ADB's SPS requirements; EMP, EMoP, and environmental management of the project.

APPENDIX 3: SUB-PROJECT SELECTION CRITERIA

The following criteria will guide the identification of potential sites for subprojects to be implemented under the ADB/POISED Project. The selection criteria draw on the guidelines and project selection criteria developed by MEE /FENAKA for renewable energy projects.

Selection Criteria	Solar-Diesel Hybrid System
Technical	Adequate solar resources. For hybrid project, the annual averaged solar irradiance should be more than 4 kWh/m2/day The project design of the mini-grid shall be grid compatible.
Economic	EIRR for the project shall not be less than 12%
Environment	The project will not support subprojects if: i) Any sub-project assessed as category A; (ii) sub-projects directly located in or within 1 km boundary of areas of biologically sensitivity or with significant habitat (e.g. on a site with endangered flora or fauna); (iii) sub-projects within protected historical or cultural heritage sites; and (iv) sub-projects with the type of activities listed in ADB SPS 2009 Appendix 5 (ADB Prohibited Investment Activities List). Environmental mitigation measures should be included in the detailed feasibility study report. Particularly battery management process/guideline should be included in the solar PV package.
Resettlement	Sub-projects shall not involve resettlement of local people, nor relocation of existing dwellings.
Productive Use of Electricity	The proposed scheme must include a feasible business plan. At least 20% of the installed capacity should be used for productive uses
Multiple Use of Water	Not applicable
Water Use and Land Use	There should be no conflict on land use rights for the project site. The management committee is solely responsible to resolve conflicts, if any, before implementation. The committee has to provide evidence in writing stating their right to use the land
Accessibility	The project site shall be accessible to at least fair roads within half day walking distance
Gender and Social Inclusion	The targeted communities will preferably be composed of socially excluded groups of people and shall commit to include them in every project related activity
Sustainability of Project	The community/users group should have clear procedures for project management and Operation & Maintenance of the project.

Operations	The plant operators should be trained and capable to operate and maintain the power plant by the time the manufacturer hands over the power plant.

APPENDIX 4: RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLISTS

A. Rapid Environmental Assessment (REA) Checklist

SOLAR ENERGY

Instructions:

(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES), for endorsement by Director, RSES and for approval by the Chief Compliance Officer.

(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.

(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:	Maldives/ Outer Islands for Sustainable Energy Development (**Solar Energy System Installations – *Name of Island***)
Sector Division:	South Asia Energy Division (SAEN)

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Physical cultural heritage site			
▪ Located in or near to legally protected area			
▪ Located in or near to special habitats for biodiversity (modified or natural habitats)			
▪ Wetland			
▪ Mangrove			
▪ Estuarine			
▪ Offshore (marine)			
B. Potential Environmental Impacts Will the Project cause…			

Screening Questions	Yes	No	Remarks
▪ large scale land disturbance and land use impacts specially due to diversion of productive lands?			
▪ involuntary resettlement of people? (physical displacement and/or economic displacement)			
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?			
▪ noise, vibration and dust from construction activities?			
▪ an increase in local traffic during construction?			
▪ environmental disturbances such as soil erosion, land contamination, water quality deterioration, air pollution, noise and vibrations during construction phase?			
• aesthetic degradation and property value loss due to establishment of plant and ancillary facilities?			
▪ changes in flow regimes of the water intake from surface water or underground wells due to abstraction for cooling purposes?			
▪ pollution of water bodies and aquatic ecosystem from wastewater treatment plant, from cooling towers, and wash-water during operation?			
▪ a threat to bird or bat life from colliding with the project facilities and/or being burned by concentrated solar rays?			
▪ industrial liquid (dielectric fluids, cleaning agents, and solvents) and solid wastes (lubricating oils, compressor oils, and hydraulic fluids) generated during construction and operations likely to pollute land and water resources?			
▪ Soil/water contamination due to use of hazardous materials or disposal of broken or damaged solar cells (photovoltaic technologies contain small amounts of cadmium, selenium and arsenic) during installation, operation and decommissioning?			
▪ noise disturbance during operation due to the proximity of settlements or other features?			
▪ visual impacts due to reflection from solar collector arrays resulting in glint or glare?			
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ social conflicts between local laborers and those from outside the area?			
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during construction, installation, operation, and decommission?			
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials and wastes such as explosives, fuel and other chemicals during construction, and operation?			

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

A Checklist for Preliminary Climate Risk Screening

Country/Project Title:

Sector :

Subsector:

Division/Department:

Screening Questions		Score	Remarks[8]
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?		
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc)?		
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?		
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?		
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?		

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

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

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

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

Other Comments:_____
_____
Prepared By: _____

THERMAL POWER PLANTS

B. Rapid Environmental Assessment (REA) Checklist

Instructions:

(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by the Director, RSES and for approval by the Chief Compliance Officer.

(iI) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.

(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:	Maldives/ Outer Islands for Sustainable Energy Development **(Addition of Diesel Generation – *Name of Island*)**
Sector Division:	South Asia Energy Division (SAEN)

SCREENING QUESTIONS	Yes	No	REMARKS
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Cultural Heritage Site			
▪ Protected Area			
▪ Wetland			
▪ Mangrove			
▪ Estuarine			
▪ Buffer Zone of Protected Area			

SCREENING QUESTIONS	Yes	No	REMARKS
▪ Special Area for Protecting Biodiversity			
B. Potential Environmental Impacts Will the Project Cause…			
▪ impairment of historical/cultural monuments and other areas, and loss/damage to these sites?			
▪ encroachment into precious ecosystem (e.g. sensitive habitats like protected forest areas or terrestrial wildlife habitats?			
▪ dislocation or involuntary resettlement of people?			
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?			
▪ aesthetic degradation and property value loss due to establishment of plant and ancillary facilities?			
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?			
▪ noise and dust from construction activities?			
▪ short-term soil erosion and silt runoff due to construction?			
▪ fugitive dust during transportation, unloading, storage, and processing of coal, and polluted runoff from coal storage?			
▪ risk of oil spills, which could pollute surface and groundwater and soil?			
▪ hazards in gas pipeline operation and gas storage at power plant sites?			
▪ changes in flow regimes downstream of the water intake due to abstraction for cooling purposes?			
▪ pollution of water bodies and aquatic ecosystem from wastewater treatment plant for boiler feed, bleed-off from cooling towers, boiler blowdown and wash-water, and effluent from ash pond?			
▪ air pollution from fuel gas discharged into the atmosphere?			
▪ public health and safety hazards due to solid waste disposal in sanitary landfills (see Matrix of Impacts and Measures for Solid Waste Disposal)?			
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ social conflicts if workers from other regions or countries are hired?			

SCREENING QUESTIONS	Yes	No	REMARKS
▪ risks community safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?			
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (e.g. ash pond) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?			

A Checklist for Preliminary Climate Risk Screening

Country/Project Title:

Sector :

Subsector:

Division/Department:

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

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a

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

medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high risk project.

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

Other Comments:_____
_____

Prepared by: _____

POWER TRANSMISSION / DISTRIBUTION

C. Rapid Environmental Assessment (REA) Checklist

Instructions:

(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to Environment and Safeguards Division (RSES) for endorsement by Director, RSES and for approval by the Chief Compliance Officer.

(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.

(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:	Maldives/ Outer Islands for Sustainable Energy Development **(Refurbishment of Mini-Grids – *Name of Island*)**
Sector Division:	South Asia Energy Division (SAEN)

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Cultural heritage site			
▪ Protected Area			
▪ Wetland			
▪ Mangrove			
▪ Estuarine			
▪ Buffer zone of protected area			

Screening Questions	Yes	No	Remarks
▪ Special area for protecting biodiversity			
B. Potential Environmental Impacts Will the Project cause…			
▪ encroachment on historical/cultural areas, disfiguration of landscape and increased waste generation?			
▪ encroachment on precious ecosystem (e.g. sensitive or protected areas)?			
▪ alteration of surface water hydrology of waterways crossed by roads and resulting in increased sediment in streams affected by increased soil erosion at the construction site?			
▪ damage to sensitive coastal/marine habitats by construction of submarine cables?			
▪ deterioration of surface water quality due to silt runoff, sanitary wastes from worker-based camps and chemicals used in construction?			
▪ increased local air pollution due to rock crushing, cutting and filling?			
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?			
▪ chemical pollution resulting from chemical clearing of vegetation for construction site?			
▪ noise and vibration due to blasting and other civil works?			
▪ dislocation or involuntary resettlement of people?			
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?			
▪ social conflicts relating to inconveniences in living conditions where construction interferes with pre-existing roads?			
▪ hazardous driving conditions where construction interferes with pre-existing roads?			

Screening Questions	Yes	No	Remarks
▪ creation of temporary breeding habitats for vectors of disease such as mosquitoes and rodents?			
▪ dislocation and compulsory resettlement of people living in right-of-way of the power transmission lines?			
▪ environmental disturbances associated with the maintenance of lines (e.g. routine control of vegetative height under the lines)?			
▪ facilitation of access to protected areas in case corridors traverse protected areas?			
▪ disturbances (e.g. noise and chemical pollutants) if herbicides are used to control vegetative height?			
▪ large population influx during project construction and operation that cause increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ social conflicts if workers from other regions or countries are hired?			
▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?			
▪ risks to community safety associated with maintenance of lines and related facilities?			
▪ community health hazards due to electromagnetic fields, land subsidence, lowered groundwater table, and salinization?			
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?			
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (e.g., high voltage wires, and transmission towers and lines) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?			

A Checklist for Preliminary Climate Risk Screening

Country/Project Title:

Sector :

Subsector:

Division/Department:

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

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

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

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

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

Other Comments:_____
_____

Prepared by: _____

APPENDIX 4: TABLE OF CONTENTS FOR SUB-PROJECT IEEs

This outline is Annex 1 of Safeguard Requirements 1: Environment (Appendix 1 of ADB's Safeguard Policy Statement, June 2009). An initial environmental examination (IEE) report is required for all environment category B projects. Category A projects are, in principle, excluded from further consideration under the POISED Project. Its level of detail and comprehensiveness is commensurate with the significance of potential environmental impacts and risks. A typical EIA report contains the following major elements, and an IEE may have a narrower scope depending on the nature of the project. The substantive aspects of this outline will guide the preparation of IEE report, although not necessarily in the order shown.

A. Executive Summary

This section describes concisely the critical facts, significant findings, and recommended actions.

B. Policy, Legal, and Administrative Framework

This section discusses the national and local legal and institutional framework within which the environmental assessment is carried out. It also identifies project-relevant international environmental agreements to which the country is a party.

C. Description of the Project

This section describes the proposed project; its major components; and its geographic, ecological, social, and temporal context, including any associated facility required by and for the project (for example, access roads, power plants, water supply, quarries and borrow pits, and spoil disposal). It normally includes drawings and maps showing the project's layout and components, the project site, and the project's area of influence.

D. Description of the Environment (Baseline Data)

This section describes relevant physical, biological, and socioeconomic conditions within the study area. It also looks at current and proposed development activities within the project's area of influence, including those not directly connected to the project. It indicates the accuracy, reliability, and sources of the data.

E. Anticipated Environmental Impacts and Mitigation Measures

This section predicts and assesses the project's likely positive and negative direct and indirect impacts to physical, biological, socioeconomic (including occupational health and safety, community health and safety, vulnerable groups and gender issues, and impacts on livelihoods through environmental media [Appendix 2, para. 6]), and physical cultural resources in the project's area of influence, in quantitative terms to the extent possible;

identifies mitigation measures and any residual negative impacts that cannot be mitigated; explores opportunities for enhancement; identifies and estimates the extent and quality of available data, key data gaps, and uncertainties associated with predictions and specifies topics that do not require further attention; and examines global, transboundary, and cumulative impacts as appropriate.

F. Information Disclosure, Consultation, and Participation This section:

(i) describes the process undertaken during project design and preparation for engaging stakeholders, including information disclosure and consultation with affected people and other stakeholders;

(ii) summarizes comments and concerns received from affected people and other stakeholders and how these comments have been addressed in project design and mitigation measures, with special attention paid to the needs and concerns of vulnerable groups, including women, the poor, and Indigenous Peoples; and

(iii) describes the planned information disclosure measures (including the type of information to be disseminated and the method of dissemination) and the process for carrying out consultation with affected people and facilitating their participation during project implementation.

G. Grievance Redress Mechanism

This section describes the grievance redress framework (both informal and formal channels), setting out the time frame and mechanisms for resolving complaints about environmental performance.

H. Environmental Management Plan

This section deals with the set of mitigation and management measures to be taken during project implementation to avoid, reduce, mitigate, or compensate for adverse environmental impacts (in that order of priority). It may include multiple management plans and actions. It includes the following key components (with the level of detail commensurate with the project's impacts and risks):

(i) Mitigation:

(a) identifies and summarizes anticipated significant adverse environmental impacts and risks;

(b) describes each mitigation measure with technical details, including the type of impact to which it relates and the conditions under which it is required (for instance, continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate; and

(c) provides links to any other mitigation plans (for example, for involuntary resettlement, Indigenous Peoples, or emergency response) required for the project.

(ii) Monitoring:

(a) describes monitoring measures with technical details, including parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits and definition of thresholds that will signal the

need for corrective actions; and

(b) describes monitoring and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures and document the progress and results of mitigation.

(iii) Implementation arrangements:

(a) specifies the implementation schedule showing phasing and coordination with overall project implementation;

(b) describes institutional or organizational arrangements, namely, who is responsible for carrying out the mitigation and monitoring measures, which may include one or more of the following additional topics to strengthen environmental management capability: technical assistance programs, training programs, procurement of equipment and supplies related to environmental management and monitoring, and organizational changes; and

(c) estimates capital and recurrent costs and describes sources of funds for implementing the environmental management plan.

(iv) Performance indicators: describes the desired outcomes as measurable events to the extent possible, such as performance indicators, targets, or acceptance criteria that can be tracked over defined time periods.

I. Conclusion and Recommendation

This section provides the conclusions drawn from the assessment and provides recommendations.

APPENDIX 5: CONTENTS OF ENVIRONMENTAL MONITORING REPORT

Part I - Introduction

- Construction activities and Project Progress during previous six months
- Changes in project organization and Environmental management team
- Relationships with Contractors, owner, lender, etc.

Part II - Environmental Monitoring

- Environmental monitoring summary – summarise the previous six months monitoring data and provide explanations of any instances where environmental standards or guidelines are exceeded. Typically this will cover:
  - Noise and Vibration
  - Water Quality
  - Air Quality
  - Flora and fauna monitoring

- Recommendations are required to show how any exceedences will be prevented in the future.
- Graphs can be used in this section to show trends, however large tables of data or multiple graphs should be attached as an appendix.

Part III - Environmental Management

- EMS, SSEMP and work plans. Report on delivery of documents, required amendments etc.
- Site Inspections and audits – summarise the number and type of site visits
- Non-compliance notices – summarise the details on the number of notices given out and the issues covered. Summarise the ranking of issues.
- Corrective action plans - report on timeliness of preparation and completion
- Consultation and complaints – report on any consultation undertaken and list any complaints received.

Annexes

- Monitoring data
- Photographs
- Implementation report on EIA/IEE mitigation requirements

Reference	Requirement	Action to date	Action required/comment