ENVIRONMENT AND SOCIAL MANAGEMENT FRAMEWORK

FOR THE PROPOSED

SOLAR PV PROJECTS

UNDER ACCELERATING SUSTAINABLE PRIVATE INVESTMENT FOR RENEWABLE ENERGY (ASPIRE) PROGRAMME

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FINAL VERSION

Ministry of Environment and Energy

Government of the Republic of Maldives

Prepared by

Ahmed Shaig, PhD

Table of Contents

List of Figures

List of Abbreviations

ADB	Asian Development Bank
ASPIRE	Accelerating Sustainable Private Investment for Renewable Energy
BP	Bank Procedures
CO2	Carbon dioxide
CIF	Climate Investment Fund
EIA	Envrionmental Impact Assessment
EMP	Environmental Management Plan
EPA	Environment Protection Agency
ESMF	Environmental and Social Management Framework
FIT	Feed-in Tariff
FM	Financial Management Assessment
GENCO	Generation Company
GHG	Greenhouse gases
GoM	Government of the Maldives
GP	Good Practices
IA	Implementation Agreement
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IFC	International Finance Corporation
IFRS	International Financial Reporting Standards
IP	Implementation Plan
ISA	International Standards on Auditing
KWp	Kilowatt peak
MEA	Maldives Energy Authority
MEE	Ministry of Environment and Energy
MW	Megawatt
NEAP II	National Environmental Action Plan II
NGO	Non-Governmental Organisation
OP	Operational Procedures
PAP	Project-Affected People
PMU	Project Management Unit
PPA	Power Purchase Agreement
PPP	Public Private Partnership
PRG	Partial Risk Guarantee
PS	Performance Standards

PV	PhotoVoltaic
RE	Renewable Energy
RPF	Resettlement Policy Framework
SREP	Scaling-Up Renewable Energy Program
STELCO	State Electric Company
WBG	World Bank Group
WMR	Waste Management Regulation

Executive Summary

This is the Environmental and Social Management Framework (ESMF) for the solar PV projects under the Accelerating Sustainable Private Investment for Renewable Energy (ASPIRE) program. This study is commissioned by the Ministry of Environment and Energy (MEE), the Government of Maldives. This ESMF establishes a mechanism to determine, assess, mitigate and manage future potential environmental and social impacts from the activities of the ASPIRE program during implementation of the planned rooftop solar PV investments.

Accelerating Sustainable Private Investment in Renewable Energy (ASPIRE) is part of the Maldives Scaling-Up Renewable Energy Program (SREP). ASPIRE program aims to encourage involvement of private parties in the renewable energy sector of the Maldives. ASPIRE has adopted a phased approach to developing PV sector investments, such that the early investors are supported through greater risk mitigation measures by International Development Association (IDA), through a series of IDA partial risk guarantees (PRGs), and SREP funds (for subsidies, capacity building, and additional guarantee support). The total value of this program is over US$27 million and predicted to be completed within a five years period. The ASPIRE resources are administered by the World Bank Group (WBG).

The ASPIRE programme will initially offer sub-projects aggregating to around 4 MW of PV installations in public buildings in Male' and Hulhumale'. The program envisages resource allocation to cover subsidy and payment guarantee support for around 20 MW of cumulative generation. The ESMF is developed to facilitate these investments.

The geographic coverage for the first phase will be the Greater Male' region, which includes, Male', Hulhule, Hulhumale', Villingli, Gulheefalhu and Thilafushi.

The Ministry of Environment and Energy (MEE) is the lead agency for all matters relating to the ASPIRE program. Within MEE, the Energy Department is responsible for overall co-ordination, facilitation, and management of the program. The Project Management Unit (PMU) will be responsible for the day-to-day implementation. The State Electric Company (STELCO) is envisaged to purchase renewable energy from private suppliers produced under ASIPRE program. The Maldives Energy Authority (MEA) establishes tariffs, issues guidelines and regulations to ensure the reliability, security of the grids, and also ensures the rights and obligations of consumers and service providers are safeguarded. The implementation of the ESMF lies with the Environmental and Social (E&S) Coordinator of the PMU.

The Constitution of the Maldives; Environment Law; Decentralization Law; General Laws (Public Property); Law on Cultural and Historical Places and Objects of the Maldives; Environment Impact Assessment Regulations, Renewable Energy Policy, Waste Management

Policy and Waste Management Regulation have provisions that are relevant to the implementation of the ASPIRE program. According to Environment Law (4/93), an EIA study is required before implementing any project that may have an adverse impact on the environment. The 2012 EIA Regulations specify the screening, scoping, reporting, and decision-making processes with regard to environmental assessment in the Maldives.

The World Bank has ten Safeguard Policies and a Disclosure Policy to ensure that Bank operations do not harm the people and the environment. All safeguard policies comprise Operational Procedures (OPs) which lists core requirements, Bank Procedures (BPs) that the client and Bank staff must follow, and Good Practices statement (GPs) which are guidelines. The safeguard policies are applicable for public sector investments. In addition, for private sector activities, the World Bank has developed performance standards (PSs).

ASPIRE is a program proposed for financial guarantee by the World Bank and hence the safeguard policies and disclosure policy apply to the program. In addition, the involvement of private sector requires adherence to the Performance Standards. The WB's Operational Policies that are deemed applicable for ASPIRE are: Environmental Assessment: OP/BP 4.01; Natural Habitats: OP 4.04; and Physical Cultural Resources: OP 4.11; The Performance Standards that are deemed applicable for ASPIRE are: PS 1: Social and environmental assessment and management systems; PS 2: Labour and working conditions; PS 3: Pollution prevention and abatement; PS 4: Community, health, safety and security; PS 6: Biodiversity conservation and sustainable natural resource management; and PS 8: cultural heritage.

The ASPIRE has been assigned as a Category B programme. Its subprojects are expected to be mostly Category B and C. Hence, partial environment assessment requirements will apply for Category B while no assessment will be required if a project is classified as Category C.

The following are specific requirements based on the project components,

- The solar roof PV project of ASPIRE program is not envisaged to cause any loss to biodiversity or natural habitats. However, there may be situations where a neighbouring property's tree (including protected species) may hinder the solar panel operation. Requirements of PS 6 would need to be met by the ASPIRE contractor(s).
- It will be important to ensure that the proposed solar PV project of the ASPIRE program does not impact any buildings of heritage significance (for example, mosques, heritage sites or cultural sites) in the Maldives. The investor and its contractors will be required to adhere to PS 8.
- All contractors must comply with PS 4 in dealing with project related workers.

The first phase of ASPIRE project is located in the Greater Male' Region. Male' is the capital of

the Maldives with 109,494 residents (DNP 2012). It is also estimated that there are more than 100,000 migrant labourers in the Male' Region. Villingili in the vicinity of Male' has been developed as the fifth ward of Male'. Hulhumale', an island reclaimed to the north of Ibrahim Nasir International Airport also serves as a satellite city to the capital Male' and has both residential and commercial development. In September 2010, work began on reclamation of Gulhifalhu lagoon near Male' to provide for additional residential and light industrial development. The Greater Male' Region was declared as a city under Decentralization Act (7/2010). There are 11 members in the Male' City Council, elected based on electoral voter percentage for a 3-year term. The second term of the Male' City Council began with the sworn in ceremony on 26th February 2014.

The Hukuru Miskiyy, (Friday Mosque), Medhu Ziyaraiy, Bodu Thakurufaan Ziyaraiy, Eid Mosque, Kalhuvakaru Mosque, Mulee-aage, the Islamic Centre; the sultan park, the national museum, Dhaarul Uloom, Majeediya School, and Aminiya School are among the City's main heritage and cultural attractions.

In 2013, the annual electricity produced in Male' was 224,562,324kWh while 8,543,892 kWh were produced in Villingili and 14,060,280 kWh in Hulhumale'. The daily peak load in Male' reached 40,761kW with the peak load time at 12 in the noon. Male' has a total installed total power generation capacity of 61,420 kW. The Government of the Maldives provides electricity and fuel surcharge subsidies for all households in Male'.

The main positive impacts from this project are:

- ASPIRE sub-projects will be renewable energy (RE) projects. RE projects are cleaner energy generation options than the diesel powered generators used for electricity production in the Male' region. The zero dependence on imported fossil fuels and the consequent reduction in the emission of greenhouse gases (GHG) make RE options preferred choice. There will be no air emissions from the project.
- ASPIRE roof top solar PV program is a source of temporary and permanent employment that will contribute to address youth unemployment and, social and economic development in the country. The program is expected to generate jobs in design, installation, operations and maintenance, project development and marketing.
- ASPIRE roof top solar PV program is aimed at reducing the cost of electricity production in the Maldives and improve energy security. Hence, at the household level the project is likely to result in cost savings, improve standard of living, increase income levels of households, and increase property value in the project location. At the national level, in the long term, the ASPIRE project is likely to reduce the economic dependency of the

Maldives on imported diesel, reduce national debt, and increase overall economic resilience.

The main negative impacts predicted from this project are:

- Overall the impacts from this program are expected to be minimal and manageable.
- Roof top solar PV will generally not have any adverse impacts on terrestrial biodiversity. Furthermore, the proposed projects are in Male' urban region where there are very few, if any, recorded fauna. However, if the adjoining properties have trees that obstruct the use of solar panels on the target building, the owner of the building, under General Laws Act 4/68, may be able to prune or cut down the obstruction, after a legal proceeding. Given this provision, there is potential for impacts of vegetation cover and possibly on protected species and trees.
- There are culturally sensitive buildings in Male' that may become a source of public resentment if used for solar panel installation. It will be important to ensure that the proposed project does not have an adverse impact on a place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical or social significance or other special value for present and future generations.
- Potentially adverse social impacts are likely to be minimal, and like environmental impacts, manageable. Such potential impacts may include: fairness and equity of decision making process, the non-use of local resident qualified manpower during the construction of the infrastructures. The use of community buildings may also be a source of conflict and resentment, if there are no direct benefits received to the community from presence of the panels.
- Decommissioning of solar panels is expected to have the highest impact on the environment. At the moment, these panels are classified as Special Waste in the waste regulation which requires specially registered handling facilities. Given the presence of harmful substances in the panels, it can also be classified as a Hazardous Waste which requires special facilities as well. At present there are no facilities in Maldives to handle large quantities of such waste. Investor will be required transport the solar panel waste overseas, if a facility does not exist in Maldives at the time of disposal.

An EMP must be prepared for all projects that are deemed to require an Environment Assessment following the screening process. The smaller projects may require an EMP only and the larger project will require an EMP embedded in the EIA. The site specific EMP will reflect the Maldives Government and/or the WB's *Environmental Guidelines for Contractors* as well as measures to mitigate construction and post construction period's environmental impacts. The

contractor must prepare the EMP and submit to the EPA, along with technical design and construction details.

A monitoring program is needed to ensure that no unforeseen impacts are occurring from the proposed roof top solar PV projects of the ASPIRE program and that any mitigation strategies that have been developed and implemented are functioning and operating as intended. To conduct monitoring, the EPA will identify a detailed set of monitoring indictors and reporting guidelines. The EPA will be the lead agency for monitoring, reporting and evaluation on environmental and social impacts of ASPIRE program.

The grievances emanating from the programme may be varied. The proposed grievance mechanism must be reviewed during EIA or EMP preparation and, if required, adjusted to suit the specific needs of the stakeholders, particularly building users and neighbours.

The ESMF was disclosed to public on …. for comments..

1 INTRODUCTION

1.1 Background

This is the Environmental and Social Management Framework (ESMF) for the solar PV projects under the Accelerating Sustainable Private Investment for Renewable Energy (ASPIRE) program. This study is commissioned by the Ministry of Environment and Energy, the Government of Maldives to develop a framework to manage effectively the environmental and social impacts of ASPIRE in the Maldives. ESMF is an instrument that examines the environmental and social issues and impacts associated when a project consists of a program and/or series of sub-projects and the impacts cannot be determined until the program or sub-project details have been identified.

This ESMF establishes a mechanism to determine, assess, mitigate and manage future potential environmental and social impacts that are likely to arise from the activities of the ASPIRE programme during implementation of the planned roof top solar PV investments. This ESMF first sets out the principles, laws, regulations, guidelines and procedures to assess the environmental and social impacts related to the ASPIRE project. It analyses the environmental and social policies and legal requirements of the Government of the Maldives and safeguard policies of the World Bank. ESMF ensures that environmental and social issues are dealt with in a proper and efficient manner meeting all the compliance requirements of the Government of the Maldives and the World Bank.

The ESMF defines the steps, processes, and procedures for screening, scoping, assessment, and monitoring, to be undertaken during planning, design, procurement, construction, and post construction stages of the ASPIRE program.

The ESMF presents a sample Environmental Management Plan (EMP), outlining the measures that will be taken to mitigate the potential adverse environmental and social impacts, offset them, or reduce them to acceptable levels. It contains measures and plans to reduce, mitigate and/or offset adverse impacts and enhance positive impacts, provisions for estimating and budgeting the costs of such measures, and information on the agency or agencies responsible for addressing project impacts. In addition, it identifies institutional and capacity building needs for environmental and social impact management in the Maldives.

1.2 Objectives

The objective of ESMF is to frame guidelines and procedures to deal with environmental and social impacts associated with the implementation of ASPIRE program.

The specific objectives are as follows:

- Identify the Maldives government laws, regulations, policies, guidelines and procedures applicable to the type of project activities financed by the ASPIRE program;
- Identify the ASPIRE relevant environmental and social safeguard policies and performance standards of the World Bank; and ensure compliance and due diligence with those policies and standards;
- Outline the process for identifying potential adverse social and environmental impacts due to ASPIRE implementation;
- Provide guideline for preparing the environmental and social mitigation plans to address the adverse impacts; describe the implementation and institutional arrangements for managing environmental and social impacts;
- Minimize potential negative environmental and social impacts as a result of either individual sub-projects or their cumulative effects;
- Enhance positive environmental and social outcomes;
- Provide a mechanism for consultation and disclosure of information;
- Ensure that environmental and related social issues are thoroughly evaluated and necessary interventions are incorporated in the planning, decision-making, and implementation of project activities;
- Protect environmentally sensitive areas from project interventions;
- Protect human health and rights of people, in particular the vulnerable groups

1.3 Study Methodology

The overall methodology for this assignment is based on development of macro level understanding through desk review of existing national and World Bank policies for environmental and social impact assessment.

The methodology adopted for the preparation of the ESMF included: review of relevant national environmental and social regulations and guidelines, review of World Bank environmental and social safeguard policies and performance standards, review of relevant literature, and consultations with key agencies of the government and all key stakeholders, field visits to

renewable energy project locations in the Maldives, and focus group discussions, in particular with environmental and social NGOs.

A literature review on the impacts of renewable energy projects particularly solar PV and wind energy was undertaken. The consultant visited recent renewable energy installation in G Dh. Thinadhoo financed through Climate Change Trust Fund for on-site observation. Only limited field surveys, given time and budgetary constraints, however were carried out.

In addition, information on the existing physical and biological environment and socio-economic conditions (poverty, employment, economic activities, etc.) was gathered. This information was used as the baseline and to guide the key assumptions and approach of the ESMF. The baseline information relevant to the project's implementation covers:

- the biophysical environment conditions
- the socio-economic status of project islands
- The membership of the project island specific Councils
- the registered Non-Governmental Organizations (NGOs)

The ESMF is to be followed for ensuring environmental and social integration in planning, implementation, and monitoring of ASPIRE project-supported activities. An outlined Environmental Management Plan has been provided to enable the MEE and EPA to set up guidelines and systems for managing the environmental, social and health and safety aspects of the project implementation.

2 ASPIRE PROGRAM DESCRIPTION

2.1 Background

The Government of Maldives, since 2009, has embarked on a policy to achieve low carbon development and reduce dependence on fossil fuel. One of the approaches to achieve these targets is through scaling-up of renewable energy resources, particularly solar and wind energy. Currently, the Maldives have a cumulative Photo Voltaic (PV) based generation capacity of around one Megawatt (MW), spread across several islands and programs. The target is to significantly increase this capacity.

The Maldives being one of the pilot countries of the Scaling-Up Renewable Energy Program in Low Income Countries (SREP), an Implementation Plan (IP) was submitted to the Climate Investment Fund (CIF) on October 2012. This SREP-IP, which was endorsed in November 2012 sub-committee, aims to "develop renewable energies on a large scale, to effectively contribute to poverty reduction and sustainable development".

Thus, a program called Accelerating Sustainable Private Investment in Renewable Energy (ASPIRE) has been conceptualized within the boundaries of the SREP and policies of the government. This program aims to encourage involvement of private parties in the renewable energy sector of the Maldives. The program will combine technical assistance with private sector investment, to scale-up the deployment of PV based generation on the islands.

The aim of ASPIRE project is to encourage and facilitate private investments in the RE sector by addressing the barriers, namely:

1. Associated high risk of investing in RE sector such as high capital investments with repatriation of profits.
2. Limited local familiarity with the technology
3. Little private sector exposure to the institutions in the sector
4. Lack of fully evolved regulatory framework in the sector
5. Domestic capital has little experience and/or appetite for investing in this sector
6. Small scale of power distribution and dispersed investment projects make it difficult to attract private sector and to reach economies of scale.

In order to address these barriers, ASPIRE has adopted a phased approach to developing PV sector investments such that the early investors are supported through greater risk mitigation measures by International Development Association (IDA), through a series of IDA partial risk guarantee (PRGs), and SREP funds (for subsidies, capacity building, and additional guarantee

support). The total value of this program is over US$27 million to be completed within a 5 year period.

SREP resources are generally administered by multilateral development banks such as Asian Development Bank (ADB), International Finance Corporation (IFC) and World Bank Group (WBG). The ASPIRE resources are administered by the WBG.

2.2 ASPIRE Implementation Approach

The ASPIRE program aims to develop the islands' potential for solar PV through private sector investments in a phased manner. Initially, ASPIRE is offering one or more projects aggregating to around 4 MW of PV installations on distributed rooftop PV systems on public buildings in Male and Hulhumale; both of them in the Greater Male Region. The program framework will be developed initially to facilitate this first phase of investments. As the program develops operational experience, it is expected to move towards greater risk taking by the private sector.

Besides the larger islands, and the Greater Male Region, opportunities for PV projects in middle and outer islands, as identified under the SREP IP, will also be developed. Innovative project designs and incentives will be offered to promote PV installations in these islands too, keeping in mind their specific conditions. Such models could include telecom companies as anchor customers; ground mounted utility PV installations, as well as more futuristic approaches.

The program design envisages resource allocation to cover subsidy and payment guarantee support for around 20 MW of cumulative generation, assuming the same level of support for subsequent installations, as for the early projects. A key unknown is government and off-taker performance in the future. This will determine the size of guarantee cover needed. SREP subsidies can support a larger deployment target, if the market has a favourable experience with initial deployments.

Based on a 10-15% penetration of PV over the program life, we estimate that the program can catalyze 35-50 MW of PV generation during the 10 year period. This will be through the establishment of a PV industry in the Maldives, and result in the mobilization of $60-85 million in investments. Ideally, further projects would continue to be implemented even after the official close of the program, without need for further guarantee or subsidy cover.

2.3 Objective, Outcomes and Outputs

The objective is for the Maldives to achieve the scale of RE deployment and make greater strides into its policy objectives, by putting in place the required safeguards that would lead to the scale-up of RE in the country.

The outcome of ASPIRE is to tap into the full potential of RE development and implementation in the Maldives. This will support portfolio development for the sector and the serve as learning platform for moving towards the achievement of the carbon neutral strategy.

The outputs to be achieved under ASPIRE are:

1. 4 MW of distributed rooftop PV systems installed in public buildings of Male' and Hulhumale';
2. Increase PV opportunities for outer islands of Maldives;
3. 20 MW of cumulative RE generation installed during program life;
4. 35-50 MW of cumulative RE generation installed beyond program life;
5. Increased energy security;
6. Reduced cost of electricity generation with possible reduction to tariff;
7. Creation of new employment and business opportunities in the RE industry;
8. Avoid about 11 million litres of diesel per year
9. Reduction in GHG emissions by approximately 25,000 tCO2/year.

2.4 Programme Components

The ASPIRE program follows a framework approach. Subprojects during implementation of the program will be appraised in batches on a streamlined basis. The program is structured around three main components: (1) Technical Assistance Support to Government of the Maldives (GoM) for institutional capacity building, preparation of the initial set of prospective projects for offering to private investors, and subsequent pipeline preparation, and (2) Structuring and Delivery of capital subsidy for the planned projects (initial and subsequent), and (3) Guarantee to cover for payment shortfalls, inconvertibility risk, and early project termination cover. The components will make strategic use of the different funding sources (IDA, SREP, GoM and Private Sector funding) to push for increasing private sector risk taking in this nascent sector. It should be noted that other funding sources may be added to fund these components, as the program develops a pipeline and a track record.

Component 1: Technical Assistance Support to GoM ($1.75 million). This component will be financed by SREP, and administered by the Project Management Unit (PMU) within the Ministry of Environment and Energy (MEE). It will encompass the following activities:

a) **TA for Enabling Private Investing in PV ($750,000):** This includes activities that will support the creation of an appropriate environment for private investing, reducing preliminary project development costs. This will include working with agencies such as

the Maldives Energy Authority (MEA) on the private sector policy and regulatory framework for RE projects, as well as developing implementation arrangements to guide both off-take utilities and private sector investors. Such guidance will help the project stakeholders negotiate partnerships, comply with standard contracts such as PPAs and rooftop leasing contracts, and reduce possibilities of conflict, thus enabling the smooth execution of transactions in this power sub-sector.

b) **Institutional Capacity Building and Knowledge Sharing ($500,000):** ASPIRE seeks to significantly increase the amount of PV capacity in-country. As a result, there is a need to build local institutional capacity for planning, implementing, operating, and monitoring power systems that are able to absorb increasing amounts of renewable energy. In addition, Maldives is witnessing a sharp increase in demand, and the initiative will address the need to provide necessary information, training and knowledge sharing in the area of renewables and energy efficiency, so that electricity production and use can be optimized.

c) **Development of Pipeline ($500,000):** The development of a pipeline of projects has to be an ongoing exercise over the program life (and possibly beyond). Identification of appropriate project sites, resource assessment, pre-feasibility work, as well as aggregation of opportunities into saleable project bundles will form a part of this sub-component. In addition to the main islands, Maldives also has over 190 dispersed inhabited islands, where project development and private investment in renewables needs to occur. Data shows that diesel fuelled generation on these islands is even less efficient than on Male and the larger islands (and hence consumes more diesel per unit generated). Since these islands are more remote, transport of fuel to these locations is more expensive, as is the maintenance of the engines. Special attention will be paid to the development of these projects since the loads are smaller. We believe that local companies, supported through capacity building and incentives are more likely to succeed in such locations.

Component 2: Structuring and Delivery of Capital Subsidy for Currently Planned and Subsequent Projects ($6.03 million). This allocated funding will be used to provide capital subsidy for projects being developed in batches under the program. This will be delivered to the private sector project developers, who will be putting in the remainder of the investment for the projects in question. For the first 4 MW of projects, we estimate that the subsidy level will be capped at $300,000/MW. While the actual subsidy level may be different - based on market assessment, and subsidy support for subsequent projects may taper; for planning purposes, the $6.03 million allocation is based on provisioning for 20 MW based on the support cap of $300,000/MW. This component will be financed by SREP, and administered by the Project Management Unit (PMU) within the MEE. The capital subsidy is expected to be delivered in 1-

3 instalments either upon commissioning, or towards the end of the construction of a particular project (i.e. after the rest of the investment has been completed).

Component 3: Guarantee Cover ($19.9 million). This component mobilizes $3.9 million of SREP resources alongside $16 million of World Bank guarantee exposure. It will function as a combination of a funded escrow account and a World Bank guarantee to (i) backstop short term payment delays as well as (ii) termination events, *if the GoM does not honor its contractual obligations*. A $3.9 million escrow amount is expected to cover up to 6 months of payments for 20 MW of installations. The utility and GoM will be obliged to replenish the escrow account once it is drawn. Thus, through this mechanism, short-term cash shortfalls and payment delays can be handled in a timely manner – a key risk identified under the market sounding exercise. If needed, under specific conditions the World Bank guarantee could be used to replenish the escrow account, in case the same is not replenished by the utility or GoM. The need for such use of the IDA Guarantee, and the exact modalities will be discussed and agreed with GoM. Similarly, currency inconvertibility risk assumed by GOM is to be backstopped through the Guarantee component. The exact modalities of this would be agreed at negotiation[1].

In the very rare cases where there are very serious and chronic utility and GoM non-performance issues, contract termination proceedings under the project contract clauses could be initiated. If such proceedings result in an award in favor of the private power developer, *and if such award is not honored*, then, once all other modalities have been exhausted, the World Bank Guarantee would be used to backstop a portion of the funds due to the project developer. While complete modalities are subject to further discussions, this part of the guarantee responds to an expressed request for risk mitigation by private developers. Please note that the use of a World Bank payment guarantee unrelated to a loan default has been approved for operations after July 1, 2014. Since this program will be presented to the World Bank Board before that date, it will require an appropriate waiver in order to use this mechanism.

Thus, as structured above, the guarantee provides risk mitigation for:

a) **Payment Risk:** This includes not only short term delays in payment, but also inconvertibility risks.

b) **Termination Risks:** This would cover contract frustration prior to commissioning, as well as termination after commissioning. The World Bank guarantee would fall off after

[1] Currently, the view is that if the project developer is unable (after clearly defined procedure) to convert the Rufiyaa he receives as payment for power delivered, to US dollars at the official exchange rate, he would be able to return the same to GoM who would be obliged to convert these to US dollars within a specified period of time. In case this fails, he could use the escrow account to receive the equivalent dollars.

10 years of operation. The actual amount of termination cover would be decided for the first 4 MW after discussion with government and private sector developer/s.

It is expected that under the ASPIRE program many PPAs would be concluded between STELCO (and later with FENAKA) and GENCOs. It is expected that under the PPA, STELCO would be required to provide an individual payment guarantee for each PPA.

The IDA Guarantee structure has been discussed preliminarily with the GoM. Through additional market soundings in the coming weeks, the proposed structure will be further refined taking into account the feedback of potential private sector developers.

2.5 Programme Target Areas

As noted above, the geographic coverage for the first phase will be Greater Male' region, which includes, Male', Hulhule, Hulhumale, Villingli, Gulheefalhu and Thilafushi (see Figure 1)

The second Phase will involve a broader range of islands in outer Atolls of Maldives. A tentative list of these islands is provided below.

Large electricity consuming islands

1. HDh. Kulhudhuffushi
2. Gn. Fuvahmulah
3. GDh. Thinadhoo
4. Addu City

Medium Electricity Consuming Islands

1. GA. Viligilli
2. Dh. Kudahuvadhoo
3. Lh. Naifaru
4. S. Hulhumeedhoo
5. Lh. Hinnavaru
6. HA. Dhidhoo
7. K. Maafushi
8. B. Eydhafushi
9. HDh Hanimaadhoo
10. N. Manadhoo
11. N. Velidhoo
12. Th. Thimarafuhsi
13. HA. Hoarafushi
14. GDh. Gadhdhoo
15. K. Himmafushi
16. N. Milandhoo
17. R. Alifushi
18. N. Holhudhoo
19. HA. Ihavandhoo
20. Th. Vilufushi
21. L. Gan (Mathimaradhoo ward)

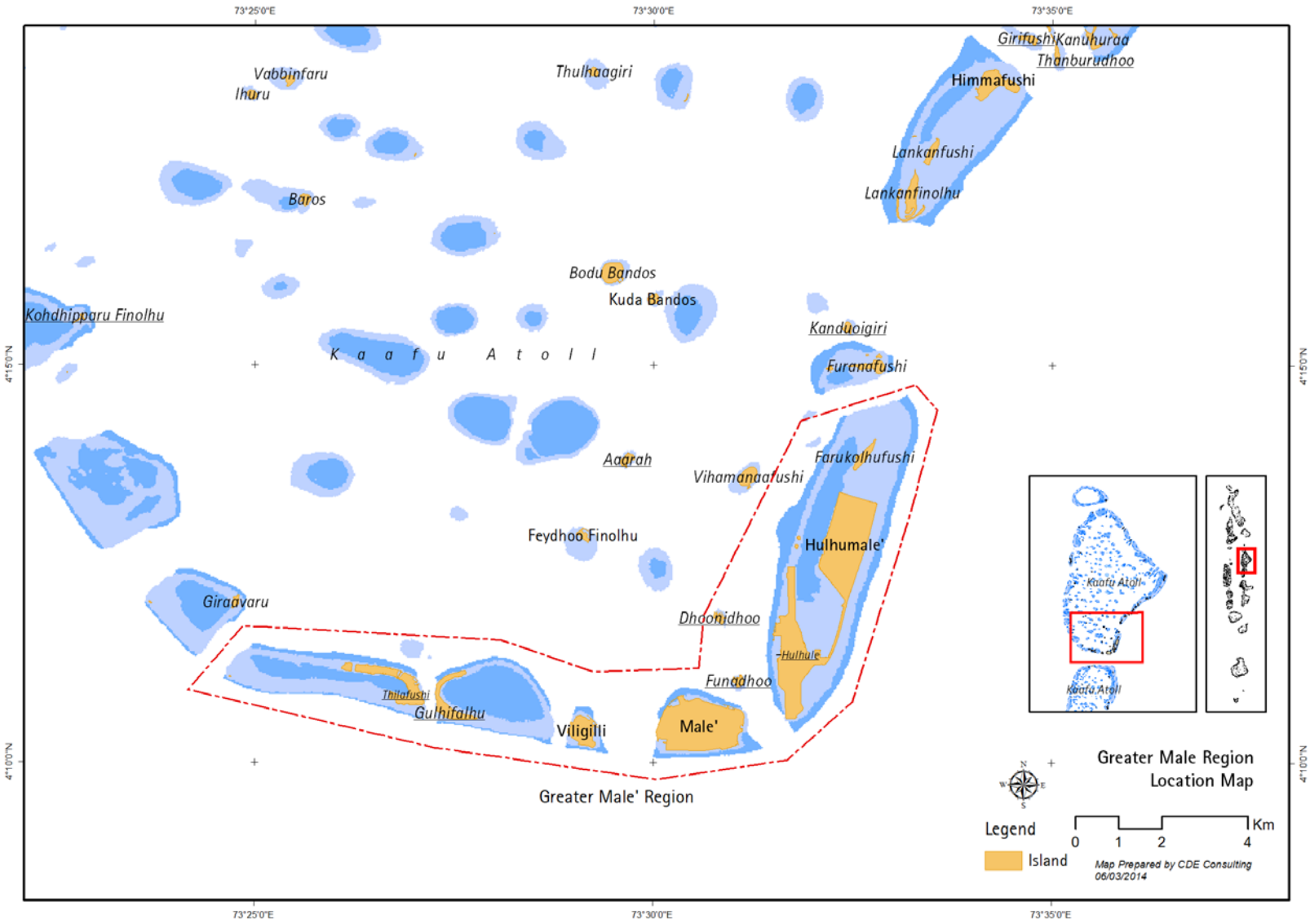

Figure 2-1 Project coverage in Phase I – Greater Male' Region

3 INSTITUTIONAL AND IMPLEMENTATION ARRANGEMENTS

3.1 Project Institutional and Implementation Arrangements

The Ministry of Environment and Energy (MEE) is the lead agency for all matters relating to ASPIRE program. The Minister of Environment and Energy represents both environment and energy portfolio in the President's Cabinet of Ministers. MEE has the mandate on energy, environment, climate change, and water resources in the Maldives. A Minister of State dedicated solely to the energy sector is responsible for renewable energy and energy efficiency policy and programs. The Permanent Secretary of the MEE is the lead civil servant responsible for energy and environment matters and is the national focal point for ASPIRE program.

Within MEE, the Energy Department is responsible for development and implementation of policies, regulations, and programs for energy sector. As such, the Energy Department is responsible for overall co-ordination, facilitation, and management of ASPIRE program.

State Electric Company (STELCO) provides electricity services to Male' Region. The company has existed for more than 40 years under different names and has developed the technical capacity to handle renewable energy projects, particularly solar PV. The envisaged role of STELCO in the ASPIRE program is to purchase electricity from private suppliers.

FENAKA Corporation provides electricity and other utility services to all inhabited islands of the Maldives, except Male' Region. The company was established very recently and lacks sufficient technical and financial capacity to implement RE projects.

The role of Maldives Energy Authority (MEA) is crucial for the success of ASPIRE program. MEA was setup under Presidential Decree to regulate STELCO and the other utilities as well as the private power producers in Maldives. It also issues licenses to power producers, regulates the electricity sector and is responsible for preparing engineering and regulatory codes and orders. MEA establishes tariffs, issues guidelines and regulations to ensure the reliability, security of the grids, and also ensures the rights and obligations of consumers and service providers are safeguarded. Hence, MEAs role is crucial for the success of significant private investment in delivering renewable electricity for ASPIRE programs. Functions of the Maldives Energy Authority (MEA) include:

- Setting standards and operating the regulations for the administration and monitoring of the power sector according to government policy on energy

• Developing the regulatory code and standards for the production and use of energy in the Maldives, and

• Issuing permits to the parties that wish to provide electricity services, setting up the system of fees for the services provided by such parties, issuing permits to parties that wish to produce electricity for their own use.

The government through its existing institutions has devised a mechanism to design, develop and implement investments in the energy sector and specifically for Maldives ASPIRE program.

3.1.1 Executing Agencies:

ASPIRE will be managed through a Project Management Unit (PMU) at GoM's Ministry of Energy and Environment (MEE). MEE has been collaborating in active World Bank projects. At present, MEE has 19 staffs working across World Bank projects. These experiences of MEE will help in implementing and coordinating activities under ASPIRE. The other key stakeholders of ASPIRE are off-taker utilities - STELCO and FENEKA, and private sector PV developers and investors.

The technical assistance component (components 1), subsidy disbursement to private sector PV developers (component 2), monitoring and evaluation, and implementation support will be directly managed and coordinated through the PMU. Responsibilities of the PMU for these activities are (i) supporting project planning (e.g. implementation work-plans, budget estimates, M&E implementation plans, etc.) (ii) actively overseeing project implementation to ensure quality and timely progress; (iii) implementing the M&E arrangements for the project, including its reporting requirements; (iv) ensuring compliance with agreed procurement, disbursements and financial management policies and procedures; (v) supervising the implementation and compliance with the ESMF; and (vi) ensuring regular reports on the progress of the project to the MEA and relevant ministries and to the World Bank, including prompt feedback on areas that need their attention or support. PMU will prepare quarterly progress reports as well as more detailed annual reports to submit to the Bank.

The guarantee under component 3 will require two distinct implementation mechanisms - one to handle the escrow account, while the other for the World Bank guarantee. The escrow portion will be managed through a commercial bank (Escrow Bank) appointed to handle the escrow account and calls on it, as well as replenishments. The Escrow Bank will also be responsible for certifying draw events. The World Bank guarantee will be managed directly by World Bank staff.

The PV generation projects will be implemented by private sector that will have overall responsibility of designing, financing, constructing, and operating PV generations for the

duration of PPAs. Each project company will set up an appropriate management structure to undertake its respective projects. PPA agreements between these private sector entities and off-takers (STELCO and FENAKA) will lay out the responsibility of each party in detail. Guarantee support from World Bank will backstop obligations to power producers from off-takers and GoM as stipulated in PPAs and Guarantee Agreements.

3.1.2 Project's Contractual Arrangements.

The contractual structure of the transactions would be consistent with industry standards with respect to the allocation of commercial, technical, and political risks among the parties in a limited recourse project financing structure. The contractual structure would consist of Implementation Agreement, Power Purchase Agreements, L/C Reimbursement and Credit Agreements, Guarantee and Counter-guarantee Agreements.

3.2 Financial Management, Disbursement and Procurement

3.2.1 Financial Management

The project is to be implemented by PMU that has experience of implementing the several IDA financed projects. According to the most recent supervision reports, the FM performance of this PMU has been rated as Satisfactory. Given that PMU will administer and coordinate technical assistance (component 1) and disbursement of subsidy to private sector (component 2) under ASPIRE, a financial management (FM) assessment will be conducted at PMU with the objectives of determining (a) whether there are adequate FM arrangements in place to ensure that the funds will be used for the purposes intended in an efficient and economical manner and PMU is capable of correctly and completely recording all transactions and balances related to the Project; (b) the project's financial reports will be prepared in an accurate, reliable and timely manner; (c) PMU's assets will be safely guarded; and (d) project will be subjected to auditing arrangements acceptable to the IDA. Project Implementation Manual and Financial Management Manual will be prepared to guide the operations of PMU in accordance with Financial Management Assessment and Risk Rating Principles.

For the guarantees (component 3), there are no traditional financial management-related fiduciary issues as there will be no World Bank financed procurement or procurement-related disbursements of guarantee resources. As per the agreement between GoM and SREP, GoM will deposit Should the guarantee be called Escrow Bank or the World Bank would disburse to the relevant private sector party. For the World Bank guarantee government would then be obligated to repay IDA in accordance with the terms of the Indemnity Agreement between the Government of Maldives and IDA. The private companies will be responsible for managing the finances of the subprojects. According to OP/BP 14.25, IDA's operational policies on Financial

Management (OP 10.00) do not apply to private sector projects supported by the IDA Guarantee. However, the implementing entities are expected to have adequate financial management systems in place.

They will install and maintain adequate financial management systems, including the system of accounting, reporting, auditing, and internal controls, and relevantly qualified staff. The annual financial statements will be prepared using International Financial Reporting Standards (IFRS) and will be audited in accordance with International Standards on Auditing (ISAs). The performance of each sub-project will be monitored through, *inter alia*, regular progress reports and audited annual financial statements to be submitted by each private companies.

3.2.2 Procurement

Procurement of goods, works and services under this project will be carried out in accordance with: World Bank "Guidelines: Procurement of Goods, Works and Non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers" dated January 2011 (Procurement Guidelines); "Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers" dated January 2011 (Consultant Guidelines); and the provisions stipulated in the Financing Agreement.

Under Component 2, subsidy awards will follow open competitive tendering and ensure bidder eligibility as required by Bank Public Private Partnership (PPP) Performance Standards. Under component 3, selected project companies provided guarantees either under the SREP escrow account or IDA Guarantee would follow private procurement procedures abiding to the World Bank's procurement guidelines for IDA Guarantees[2] which require that procurement of goods, works and services for a guarantee supported project must be carried out with due attention to economy and efficiency, and that such goods, works and non-consulting services to be procured:

a) are of satisfactory quality and are compatible with the balance of the project;

b) will be delivered or completed in timely fashion; and

c) are priced so as not to affect adversely the economic and financial viability of the project.

Procurement Capacity: The PMU of the MEE, that manages several WB funded projects, will be responsible for overall procurement oversight under this project. It would directly procure the TA activities under component 1 and play an important role under components 2 and 3 to competitively select private sector investors based on quality and cost considerations guided by international standards pertinent to distributed grid connected PV generation.

[2] Paragraph 3.18 of the Guidelines Procurements of Goods, Works and Non-consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers, dated January 2011.

The procurement team is well experienced in handling Bank financed procurement. MEE has experience under the following active World Bank projects: "Maldives Renewable Energy Resource Mapping and Geospatial Planning" (P146018), "Maldives Clean Energy for Climate Mitigation Project" (P128268), "Maldives Environmental Management Project" (P108078) and "Maldives Ari Atoll Solid Waste Management Project" (P130163). At present, MEE has 19 staff working across World Bank projects.

3.3 Environmental and Social (including safeguards)

The implementation of the ESMF lies with the Environmental and Social (E&S) Coordinator of the PMU supported by the energy sector coordinator, as needed. The private developers that will be investing on the PV sector will need to follow the World Bank performance standards by ensuring a suitable environmental and social management system (ESMS) are in place based on the requirements identified in the ESMF. The bidding documents will include the mitigation measures identified in the ESMF which will be part of the EMP/ESMS for the contract along with other applicable clauses to ensure environmental and social compliance during the commissioning. Once identified the private developers who will be participating in the ASPIRE program will be assessed on the existing environmental and social due diligence processes and functionality and ESMSs will be developed that accounts for the existing systems and processes and measures for any gaps identified. Private developer will be fully responsible for managing works, commissioning and decommissioning based on the ESMF and the respective ESMS. E&S Coordinator will monitor compliance, provide guidance to contractors through the private developer and report on the progress of environmental and social compliance of the project including the status of safeguards performance indicators.

Activities supported under technical assistance that may have future safeguard impacts will be managed through the safeguards policies of the Bank through the guidelines of ESMF. If any other RE sector will be supported through these components, the PMU will ensure that applicable safeguard policies and GoM laws and regulations are integrated into the technical assistance activities. All such activities will need to be cleared he World Bank and EPA.

3.4 Monitoring & Evaluation

Overall monitoring and evaluation (M&E) of project activities will be MEE's responsibility. The MEE will carry out monitoring and evaluation of the different components/activities in accordance with the indicators included in the results framework for SREP. The indicators, targets, and mechanisms for monitoring will be discussed and agreed with MEA, including SREP indicators at the program level.

IDA will monitor and supervise the projects through the submission of reports by private sponsors as required under IDA's Project Agreement, with each company, as well as through regular field visits until the expiry of each IDA Guarantee. The submission of relevant reports by the off-taker/s will be required under IDA's Indemnity Agreement with GoM..

Impact evaluation of the ASPIRE program entails assessing the program's impact on mobilizing private sector investment and assessing impacts on savings accrued at STELCO and FENAKA. For the latter, baseline information will be collected from the utilities on spending on fossil fuel and subsidies. Savings from use of PV generation both in monetary terms and in terms of fuel use will be determined for agreed time intervals. Impact evaluation will show the relation between solar PV penetration and the corresponding savings.

Impact of the program in improving reliability and quality of power supply at STELCO and FENAKA's electricity networks will be evaluated at various stages of PV penetration. Baseline information will be collected from the utilities in terms of frequency of power outages and overall voltage profile. Reduction of power outages and stabilization of voltage profile from added capacity from distributed PV will be determined for agreed time intervals to show the relation between PV penetration and corresponding benefits.

4 NATIONAL LEGISLATIVE, REGULATORY AND POLICY FRAMEWORK

The environment and social safeguard related national laws, regulations and policies that will have to be considered for ASPIRE programme are:

4.1 Constitution of the Maldives

The new constitution of the Maldives adopted in 2008 has several provisions to protect the rights of citizens to environment, health, and private property that are relevant to the scope of the roof top solar PV component of the ASPIRE program. The relevant articles include:

Article 22:

"The State has a fundamental duty to protect and preserve the natural environment, biodiversity, resources and beauty of the country for the benefit of present and future generations. The State shall undertake and promote desirable economic and social goals through ecologically balanced sustainable development and shall take measures necessary to foster conservation, prevent pollution, the extinction of any species and ecological degradation from any such goals."

Article 23:

"Every citizen has the following rights pursuant to this Constitution, and the State undertakes to achieve the progressive realisation of these rights by reasonable measures within its ability and resources:

(a) adequate and nutritious food and clean water;

(b) clothing and housing;

(c) good standards of health care, physical and mental;

(d) a healthy and ecologically balanced environment;

(e) equal access to means of communication, the State media, transportation facilities, and the natural resources of the country;

(f) the establishment of a sewage system of a reasonably adequate standard on every inhabited island;

(g) the establishment of an electricity system of a reasonably adequate standard on every inhabited island that is commensurate to that island."

Article 67:

"The exercise and enjoyment of fundamental rights and freedoms is inseparable from the performance of responsibilities and duties, and it is the responsibility of every citizen:

(h) to preserve and protect the natural environment, biodiversity, resources and beauty of the country and to abstain from all forms of pollution and ecological degradation;

Article 230 (a)

(a) The administrative divisions of the Maldives shall be administered decentrally.

Article 231 (a)

"All members of councils created for decentralised administration shall be democratically elected by secret ballot by their respective communities."

Article 232

"The responsibilities of councils elected for decentralised administration shall include:

a. to provide democratic and accountable governance;
b. to foster the social and economic well-being and development of the community;
c. to establish a safe, healthy and ecologically diverse environment;
d. to achieve such other objects as prescribed by law.

Access to the court or other impartial and independent authority for the determination of the interest or right of a citizen, provision for payment of adequate compensation when a citizen is deprived of a right are all provisions that are relevant to the scope of activities in ASPIRE program.

4.2 Environment Law

The Environmental Protection and Preservation Act (EPPA, Act No: 4/93) enacted on 19 March 1993 is the framework law related to environment protection in the Maldives. The authority responsible for the Environment Act is the Ministry of Environment and Energy.

Articles 2, 4, 5, 6, 7, and 8 of the law are relevant to the ASPIRE programme.

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 contractors shall abide by any guidelines or advice given by the concerned Government authorities for the project.

Article 4 states that the Ministry of Environment 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 project contractors shall ensure that there is no negative impact from the proposed project on any protected areas or protected species.

According to Article 5 (a) of the Act, an Environmental Impact Assessment study shall be submitted to the Ministry of Environment before implementing any development project that may have a potential impact on the environment.

According to Article 5 (b), The Ministry of Environment shall formulate the guidelines for EIA and shall determine the projects that need such assessment as mentioned in paragraph (a) of this clause.

All ASPIRE projects will have to be submitted by the private investors (referred as developers) to Environment Protection Agency (EPA) of the Ministry of Environment for screening to fulfil the legal requirement stipulated in Article 5 of Act (4/93).

According to Article 6, the Ministry of Environment has the authority to terminate any project that has any undesirable impact on the environment. A project so terminated shall not receive any compensation.

All ASPIRE project contractors shall be aware of this provision and contractors shall take all practical measures to ensure there is no irreversible and significant negative impact of the projects on the environment

Article 7 of the EPPA (4/93) states that any type of waste, oil, poisonous gases or any substances that may have harmful effects on the environment shall not be disposed within the territory of the Maldives. In cases where the disposal of the substances becomes absolutely necessary, they shall be disposed only within the areas designated for the purpose by the government. If such waste is to be incinerated, appropriate precaution should be taken to avoid any harm to the health of the population.

All ASPIRE project contractors shall formulate an Environmental Management Plan for their projects which specifies how the wastes, oil and gases generated by the project will be disposed.

Article 8 of the EPPA (4/93) states that Hazardous/ Toxic or Nuclear Wastes that is harmful to human health and the environment shall not be disposed anywhere within the territory of the country.

Any hazardous wastes that may be generated from an ASPIRE project shall be transferred to the designated waste site in Thilafushi for disposal according to Government regulations and standards.

4.3 Decentralization Act

The Decentralization Act establishes the local councils as the highest political authority in the locality and who shall have executive powers to be exercised in accordance with this Act. The Act establishes Atoll Councils, Island Councils and City Councils.

According to Articles 24 (e) and 42 (e) of the Decentralization Act provision of electricity, water, sewerage and other utility services in their jurisdictions according to the laws of the Maldives is the responsibility of Island Councils and City Councils respectively.

Articles 24 (b) and 42 (b) of the Act mandate Island Councils and City Councils to provide adequate waste management services.

According to Article 23 (h), (i) and Article 41 (g), Island Councils and City Councils are responsible for release of land for development according to the provisions of the Land Act, the Land Use Plan of the island, and any guidelines issued by the Ministry responsible for land.

The initial stage projects of ASPIRE will be implemented in localities that are under jurisdictions of Male' City Council. Electricity provision for the Male' region according to the laws of the Maldives is a service that Male' City Council is mandated to provide. Hence, all project proponents shall inform and consult the Male' City Council for projects that are implemented in Male', Villingili, and Hulhumale'. Furthermore, Male' City Council is likely to be the first point of contact for locals who may have grievances with regard to any ASPIRE projects in Male region.

4.4 General Laws Act – 4/68 (Public property)

The General Laws Act 4/68, Paragraph 7 stipulates that public property such as trees, coconut palms, farm land, households and such owned by public or private individuals, if required to be obtained by the Government, the property can be obtained by the Ministry of Justice or the High Court of the Maldives. The above shall be done only after the individual is fairly compensated

for the property or by financial compensation proposed by the property holder. If the public property to be attained is a land plot or a household, the property holder shall be given adequate time for clearance of the area. If a private property belonging to one individual creates nuisance to another, for issues in Male' the matter shall be resolved by the Ministry of Home Affairs and Housing or Ministry of Atolls and Development for issues arising in the islands.

Although Act 4/68 is a law that was passed in 1968 and is simplistic and ambiguous, this law is applicable to all public grievances with regard to both public and private property. It is important that ASPIRE project proponents are aware of the provisions in this law, since any issues of aesthetic, light reflection, and safety issues of solar PV installation that may be raised by neighbours or community at large will be considered under Para 7 of this law.

4.5 Law on Cultural and Historical places and objects of the Maldives - 27/79

The Law on Cultural and Historical Places and Objects of the Maldives 27/79 prohibits destroying or damaging any historical and cultural places, sites, objects and artefacts belonging to the sovereign area of the Maldives. The historical and cultural objects are those that were used by or feature the life of locals or foreign ancestors who had resided in the Maldives. The historical and cultural places refer to religious monuments, idols or place of worship or residences used by locals or foreign ancestors who had resided in the Maldives.

All ASPIRE project proponents must ensure that the buildings selected for installation of solar PV does not have an adverse impact on a site of historical and cultural significance. The Culture and Heritage Section of the Ministry of Youth and Sports must be consulted to check if a building selected for the project may have an adverse impact on a building or site of significance.

4.6 Environmental Impact Assessment Regulations 2012

Environmental Impact Assessment regulations were issued by MEE on 8 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 programme. This report follows the principles and procedures for EIA outlined in the EIA regulations.

The EIA report is reviewed by MEE following which an EIA Decision Note is 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 is committed

to implement all impact mitigation measures that are specified in this EIA report. Furthermore, the proponent is committed to environmental monitoring and shall fulfil environmental monitoring requirements that may be specified in the EIA decision note as a condition for project approval. The processes specified in this ESMF for the EIA or EMP preparation is based on the EIA regulations of 2012.

4.7 National Sustainable Development Strategy (NSDS)

ASPIRE program is in alignment with the National Sustainable Development Strategy. The third goal of the NSDS is to advance energy security in the Maldives. The following objectives are set to achieve the goal of energy security:

- Make energy supply secure and affordable
- Reverse the increasing dependency on diesel powered electricity generation in the Maldives and limit climate change
- Provide for reliable delivery of energy and guard against energy emergencies
- Invest in advanced technologies that make a fundamental improvement in the mix of energy options, and improve energy efficiency
- Acquire and demonstrate sound water technologies suitable to small coral island environment

4.8 Energy Policy

The ASPIRE program is supported by a number of energy policy decisions, including the National Energy Policy and the National Energy Action Plan (2009-2013) that have been adopted to guide the development of the energy sector in the Maldives. In addition, a number of policies have been developed to encourage private investments in the energy sector - including a zero import duty for RE related merchandise and the introduction of FIT regulations.

The National Energy Policy provides for developing greater sustainability, conservation and efficiency in energy while promoting low carbon technologies and the quality of energy supply. The National Energy Policy has following objectives:

- Provide all citizens with access to affordable and reliable supply of electricity
- Achieve carbon neutrality in the energy sector by 2020
- Promote energy conservation and energy efficiency
- Increase national energy security

- Promote renewable energy technologies
- Strengthen the management capacity of the energy sector
- Adopt an appropriate pricing policy for the energy sector
- Ensure customer protection
- Enhance the quality of energy services.

The Energy Action Plan (2009-2013) includes a series of actions, measures, programmes and targets to be met over five years to achieve greater energy efficiency and conservation awareness, together with reductions in CO2 emissions. The key strategies in the action plan include:

Provide all citizens with access to affordable and reliable supply of electricity through:

- Developing utilities to upgrade and manage power infrastructure on the islands and improve the efficiency and quality of services;
- Encouraging private sector participation to develop, manage and sustain electric services;
- Encouraging national and international investments to develop and sustain energy; and
- Introducing incentives to power sector developers to ensure affordability of energy supply by facilitating access to grants and concessional finance.

Achieve carbon neutrality by year 2020 through:

- Developing plans for energy sector to include forecast of energy usage by different sources, GHG emissions and assessing status of carbon neutrality;
- Setting and monitoring targets to track energy sources, composition, efficiency and losses to achieve carbon neutrality and sustaining it;
- Adopting standards for exhaust emission for power plants, vehicles and vessels that use fossil fuel in order to improve air quality; and
- Promoting carbon capture and sequestration.

Promote energy conservation and energy efficiency to reduce costs through:

- Promoting energy efficiency and energy conservation to achieve economic use of energy without lowering the quality of service rendered;

- Promoting energy efficiency in electricity production, distribution and usage via workshops involving necessary stakeholders;
- Promoting demand side management with focus on large energy users;
- Identifying all areas of improvement and provide technical advice in fuel conservation and efficiency in different modes of transport; and
- Introducing incentives to encourage greater use of electric vehicles by establishing charging stations using RE sources.

Promote RE technologies through:

- Introducing and demonstrating new renewable technologies application;
- Facilitating and promoting research opportunities for locals and international parties by informing about potential of RE sources within the country;
- Developing human resource capacity for RE throughout the country by introducing RE related courses in college curriculum;
- Encouraging and promote bio fuels; and
- Encouraging the development of power generation capability by utilizing the household waste and bio fuels.

4.9 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;
- Ensure safe disposal of chemical, hazardous and industrial waste.
- The proponents of the ASPIRE program projects must be aware of the policy and all solid and hazardous waste produced in this project should be disposed according to the Environmental Management Plan for the project, which reflects the principles of the Waste Management Policy.

4.10 Waste Management Regulation 2013

Waste Management Regulation (WMR) was published on August 2013 and comes into effect in February 2014. It will be implemented by EPA. The aim of WMR is to implement the national waste policy which contains specific provisions to:

- Implement measures to minimize impacts on human health
- Formulate and implement waste management standards
- Implement an integrated framework for sustainable waste management
- Encourage waste minimisation, reuse and recycling
- Implement Polluter-Pays Principle
- Introduce Extended Producer Responsibility

WMR contains four main sections:

- Waste management standards: Defines standards for waste collection, transfer, treatment, storage, waste site management, landfills and managing hazardous waste.
- Waste management Permits: Defines approval procedures for waste sites
- Waster transfer: Standards and permits required for waste transport on land and sea, including trans-boundary movements.
- Reporting requirements: Defines reporting and monitoring requirements and procedures.
- Enforcement: Defines procedures to implement WRM and penalties for non-compliance.

Given the presence of hazardous chemicals in solar panels, their disposal at the time of decommissioning is subject to specific provisions defined for hazardous waste disposal. Electronic waste is also classified as a Special Category waste, which will require handling facilities. If the waste is to be disposed in the Maldives, it should be handled by waste sites specifically approved to manage hazardous and Special Category waste. Transportation and handling shall also conform to the standards specified in WRM.

If the waste is to be exported for reuse or disposal in another country, an application needs to be submitted to EPA 3 months prior to the shipping date. EPA will issue an approval based on compliance with WRM clauses and international conventions.

Thus, the ASPIRE projects will need to comply with the WRM in disposing construction and decommissioning related wastes.

5 WORLD BANK ENVIRONMENTAL AND SOCIAL SAFEGUARDS

The World Bank has ten Safeguard Policies and a Disclosure Policy to ensure that Bank operations do not harm the people and the environment. The ten safeguard policies are: Environmental Assessment (EA); Natural Habitats; Cultural Property; Disputed Areas; Forestry; Indigenous Peoples; International Waterways; Involuntary Resettlement; Pest Management; and safety of Dams. Most safeguard policies comprise operational procedures (OPs) that list core requirements and bank procedures (BPs) that the borrower and Bank staff must follow.

The World Bank also has eight separate 'performance standards' which govern the client's role and responsibilities for projects involving private sector. These performance standards are: assessment and management of social and environmental risks and impacts; labour and working conditions; resource efficiency and pollution prevention; community, health, safety and security; land acquisition and involuntary resettlement; biodiversity conservation and sustainable management of living natural resource; indigenous peoples; and cultural heritage.

The objectives of the Safeguard Policies are to: (i) Ensure that Environmental and Social issues are evaluated in decision-making; (ii) Reduce and manage Risk of project/program; and (iii) Provide a mechanism for Consultation and Disclosure of Information. In addition, Public Disclosure Policy (BP 17.50) requires timely disclosure of information including documents such as the ESMF of ASPIRE.

ASPIRE is a program proposed for financial guarantee by the World Bank and hence the safeguard policies and disclosure policy apply for the program. In addition, the involvement of private sector requires adherence to the Performance Standards. The WB's Operational Policies that are deemed applicable for ASPIRE are:

- Environmental Assessment: OP/BP 4.01;
- Natural Habitats: OP 4.04;
- Physical Cultural Resources: OP 4.11;

The Performance Standards (see Appendix F) that are deemed applicable for ASPIRE are:

- PS 1: Social and environmental assessment and management systems
- PS 2: Labour and working conditions
- PS 3: Pollution prevention and abatement
- PS 4: Community, health, safety and security

- PS 6: Biodiversity conservation and sustainable natural resource management
- PS 8: Cultural heritage.

5.1 Banks Operational Policies

5.1.1 OP/BP 4.01 Environmental Assessment

Objective

Of all the World Bank's Safeguard Policies, OP 4.01 Environmental Assessment (EA) is considered the umbrella Safeguard Policy. The objective of OP/BP 4.01 Environmental Assessment policy is to ensure that Bank-financed projects are environmentally and socially sound and sustainable, and that decision-making is improved.

Definition

EA is a tool to evaluate a project's potential environmental risks and impacts in its area of influence; examine project alternatives; identify ways of improving project selection, siting, planning, design, and implementation by preventing, minimizing, mitigating, or compensating for adverse environmental impacts and enhancing positive impacts; and includes the process of mitigating and managing adverse environmental impacts throughout project implementation.

Scope

The scope of EA covers the natural environment (air, water, and land); human health and safety; social aspects (involuntary resettlement, indigenous peoples, and physical cultural resources); and trans-boundary and global environmental aspects. EA also shall include the findings of country environmental studies; national environmental action plans; the country's overall policy framework, national legislation, and institutional capabilities related to the environment and social aspects; and obligations of the country, pertaining to project activities, under relevant international environmental treaties and agreements.

EA Instruments

Depending on the project, different instruments can be used to fulfil the World Bank's EA requirement: environmental impact assessment (EIA), regional or sectoral EA, strategic environmental and social assessment (SESA), environmental audit, hazard or risk assessment, environmental management plan (EMP) and environmental and social management framework (ESMF).

Environmental Screening

Environmental screening is used by the World Bank to determine the extent and type of EA. Depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts, the Bank's project screening criteria groups projects into four categories:

I. *Category A*: Full Environmental Assessment - A proposed project is classified as Category A if it is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented.

II *Category B:* Partial Environmental Assessment - if proposed project has potential adverse environmental impacts on human populations or environmentally important areas including wetlands, forests, grasslands, and other natural habitats–that are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily than for Category A projects.

III. *Category C:* Minimal or no adverse impacts. A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required for a Category C project.

IV. *Category FI:* A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary, in subprojects that may result in adverse environmental impacts.

Following application of OP 4.01, as indicated above, any potential impact on the Bank's other safeguard policies, would be carefully reviewed. Where a sub-project is likely to have impacts, the relevant polices provisions will apply.

The ASPIRE has been assigned as a Category B program. Its subprojects are expected to be mostly Category B and C.

5.1.2 Natural Habitats, OP 4.04

This policy recognizes that the conservation of natural habitats is essential to safeguard unique biodiversity and to maintain environmental services and products for human society and for long-term sustainable development. The Bank therefore supports the protection, management, and restoration of natural habitats in its project financing, as well as policy dialogue and economic and sector work. The Bank supports, and expects borrowers to apply, a precautionary approach to natural resource management to ensure opportunities for environmentally

sustainable development. Natural habitats are land and water areas where most of the original native plant and animal species are still present. Natural habitats comprise many types of terrestrial, freshwater, coastal, and marine ecosystems. They include areas lightly modified by human activities, but retaining their ecological functions and most native species.

The Bank's Natural Habitats Policy is triggered by any project (including any subproject under a sector investment or financial intermediary loan) with the potential to cause significant conversion (loss) or degradation of natural habitats, whether directly such as through construction, or indirectly, through human activities induced by the project. The policy has separate requirements for critical, either legally or proposed to be protected or high ecological value, and non-critical natural habitats. The Bank's interpretation of "significant conversion or degradation" is on a case-by-case basis for each project, based on the information obtained through the EA.

The solar roof PV project of ASPIRE program is not envisaged to cause any loss to biodiversity or natural habitats. However, there may be situations where a neighbouring property's tree (including protected species) may hinder the solar panel operation, in which case, The General Laws Act 4/68 may be invoked by the investor/proponent and may request to cut parts of the infringing tree. There is possibility of dumping debris generated during installing of solar PVs into natural habitats; therefore, this policy is triggered.

Requirements of OP 4.04 would need to be met by the ASPIRE contractor(s). This Policy is meant to promote environmentally sustainable development by supporting the protection, conservation, maintenance and rehabilitation of natural habitats and their functions. It requires that the Bank should not fund projects that degrade critical natural habitats.

5.1.3 Physical Cultural Resources: OP 4.11

The objective of OP 4.11 policy is to assist countries to avoid or mitigate adverse impacts of development projects on physical cultural resources. For purposes of this policy, "physical cultural resources" are defined as movable or immovable objects, sites, structures, groups of structures, natural features and landscapes that have archaeological, pale-ontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings, and may be above ground, underground, or underwater. The cultural interest may be at the local, provincial or national level, or within the international community. The Bank seeks to assist countries to manage their physical cultural resources and to avoid or mitigate adverse impact of development projects on these resources.

It will be important to ensure that the proposed solar PV project of the ASPIRE program does not impact any buildings of heritage significance (for example, mosques, heritage sites or

cultural sites) in the Maldives. The project will be required to obtain written permission from the relevant national authority if such sites are selected or there could be indirect impacts due to the project.

5.1.4 Public Disclosure

The Bank's Operational Policies further requires that the Government of the Maldives and the World Bank, as a condition for project funding, must disclose the ESMF as a separate and standalone document before Bank's Appraisal of the proposed project.

The ESMF has been disclosed in English with a Divehi translation of the executive summary on XX April 2014. Other safeguards instruments will be disclosed in English once they are prepared.

5.2 Performance Standards

5.2.1 Assessment and management of environmental and social risks and impacts (PS1)

The primary objectives of PS1 is are to: (i) identify and evaluate environmental and social risks and impacts of the project; (ii) mitigation of impacts and/or identifying compensation; (iii) improved social and environmental performance and ; (iv) promote and provide means for adequate engagement with Affected Communities. This Performance Standard applies to private sector business activities with environmental and/or social risks and/or impacts.

A key requirement of this standard is to prepare an Environmental and Social Assessment and Environmental and Social Management Systems (ESMSs) appropriate to the nature of and scale of the proposed project.

The ESMS shall incorporate the following elements: (i) policy; (ii) identification of risks and impacts; (iii) management programs; (iv) organizational capacity and competency; (v) emergency preparedness and response; (vi) stakeholder engagement; and (vii) monitoring and review.

Given that the ASPIRE project involves private sector involvement and that the project proponents are going to be private investors, this performance standard should be adhered. The requirement for ASPIRE program EAs (as described in the next chapter) incorporates the requirements specified here.

5.2.2 Labour and working conditions (PS2)

The objectives of Performance Standard 2 are to: (i) promote the fair treatment, non-discrimination, and equal opportunity of workers; (ii) to establish, maintain, and improve the

worker-management relationship; (iii) to promote compliance with national employment and labor laws; (iv) to protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the client's supply chain; (v) to promote safe and healthy working conditions, and the health of workers, and ; (vi) to avoid the use of forced labor.

Three groups of workers are defined: (i) direct workers; (ii) contracted workers, and; (iii) supply chain workers. For each group a specific set of requirements are defined.

For direct workers employed under an ASPIRE project, the following requirements must be met:

1. If direct workers (workers directly employed by the developer) are used, the developer must meet the requirements 8 – 23 (See Appendix F), which covers human resource policies and procedures, appropriate working conditions and term of employment, rights to worker organization, provision of equal opportunity, avoidance of discrimination, major retrenchment, provision of grievance mechanism, avoidance of child or forced labour and provision of proper health and safety.
2. If contracted workers (workers engaged by a third party) are used, the developer must meet the requirements 23 – 26 of this Performance Standard (See Appendix F).

5.2.3 Resource efficiency and pollution prevention (PS3)

The objectives of Performance Standard 3 are to: (i) avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities; (ii) promote more sustainable use of resources, including energy and water, and; (iii) reduce project-related GHG emissions.

The choice of technology for the ASPIRE program – solar energy – will contribute to reduce emissions in Maldives and contribute positively to the improvement of air quality. There are also no major pollution anticipated during construction or operations stage.

However, project decommissioning will contribute to pollution, particularly given the high volume of solar panels to be decommissioned and the presence of certain chemicals in the panels that are harmful to the environment. Thus, the ASPIRE project must adhere to Performance Standard 3 with regard to waste generation and hazardous material management.

This aspect is addressed in the EMP requirements of this project. The need for a written agreement with a waste disposal site, either local or international, has been included as a requirement of this project. At present there is no local waste management site capable of managing the electronic and solar panel waste arising from this project.

5.2.4 Community, health, safety and security (PS4)

Performance Standard 4 recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. The objectives of this Standard is to: (i) anticipate and avoid adverse impacts on the health and safety of the Affected Community during the project life from both routine and non-routine circumstances and; (ii) ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities.

The ASPIRE program's proposed construction activities on existing public or private buildings and their proximity to neighbouring buildings, particularly in Male', necessitates the adherence to "Infrastructure and equipment design and safety" clauses identified in this standard.

In particular, the client will have to consider incremental risks of the public's potential exposure to operational accidents and/or hazards and be consistent with the principles of universal access. Structural elements will have to be designed and constructed by competent professionals, and certified or approved by competent authorities or professionals.

The proposed EMP requirement for this project contains provisions to ensure community safety. A recommendation has also been put forward for the Maldives Energy Authority to develop a guideline or standards for installation and maintenance of Solar Panels.

5.2.5 Biodiversity conservation and sustainable natural resource management (PS6)

The objective of Performance Standard 6 is: (i) to protect and conserve biodiversity; (ii) to maintain the benefits from ecosystem services, and ; (iii) to promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.

The applicability of this Performance Standard will be based on the results of environmental screening. The project is generally expected to have minimal negative impact on biodiversity. However, the vegetation clearing and pruning is expected as an activity for some of the sub-projects, Some of the islands proposed for Phase II contains protected areas, sensitive environments and protected trees.

Depending on the scope of vegetation clearance in ASPIRE projects, the sections on protection and conservation of biodiversity (clause 10), modified habitat (Clauses 12), natural habitat (clauses 14 and 15), critical habitat (clause 17) and, legally protected and internally recognized areas (Clause 20) are applicable.

This standard requires a process of risk identification (clause 6), mitigation (clause 7) and use of professionals to carry out tasks related to natural habitat appraisal.

5.2.6 Cultural heritage (PS7)

The objective of Performance Standard 7 is to protect cultural heritage from the adverse impacts of project activities and support its preservation, and to promote the equitable sharing of benefits from the use of cultural heritage.

Applicability of this standard will be determined at the project screening stage as identified in the next chapter.

The ASPIRE projects involves using public and private roofs for solar panel installations. This may involve the use of cultural or religious sites on inhabited islands, such as mosques.

Thus, the sections on Protection of cultural heritage in project design and execution, particularly, general clauses (clauses 6, 7) and consultations (clause 9) are applicable.

5.3 Management responsibility for the ASPIRE triggered Safeguard Policies, Performance Standards and national legislation and policies

Once the Developers get identified, an assessment will be conducted on the environmental and social standards and functionality of each Developer. Based on the findings, for each Developer an environmental and social management system will be developed which recognizes each Developer's existing compliances and applicable processes, as well as the gaps and proposed measures to address the gaps.

Based on the environmental screening results, the ASPIRE's relevant Developer will develop appropriate measures to manage the impact of a potentially triggered policy. Land acquisition, *if any*, under the ASPIRE would be Contractor's responsibility, a private transaction, outside the application of the World Bank's Safeguard Policies. Even if the contractor requires any private land during implementation stage of the project, it will be the responsibility of contractor to negotiate with the owner and not the government to acquire land. Hence, no Resettlement Policy Framework (RPF) has been prepared.

Depending upon the potential significance of the environmental and social impacts, a Developer may have also have to prepare an EIA, ESMP and other safeguard documents, as needed, to provide mitigation and other measures. In anticipation of this, and to guide, the MEE has prepared this ESMF. The MEE, if requested, can also provide general guidance to the Developer(s). All Developer-prepared documents will be reviewed the PMU/MEE, and if applicable, by the Environment Protection Agency (EPA). The Developer will be responsible for

implementing mitigation measures as may be required by the EPA and adhere to the relevant Performance Standards.

The ASPIRE project activities will be implemented in selected islands of the Maldives. The Male' City Council, and the project specific Island Councils will have management responsibilities under the ASPIRE triggered Safeguard Policies.

5.4 Public Consultations

For all Category A and B projects, during the EA process, the project proponent is required to consult project-affected groups and local nongovernmental organizations (NGOs) about the project's environmental and social aspects and to take their views into account. The project proponent shall initiate such consultations as early as possible. The project proponent has to consult with these groups throughout project implementation as necessary to address EA-related issues that affect them.

ASPIRE projects are classified as Category B projects and hence public consultation will be necessary. Public consultation must be an integral part of planning, preparing, assessing and implementing ASPIRE sub-projects. For example, to assess the potential environmental and social impact of the ASPIRE sub-projects, prior and informed consultation with key stakeholders, in particular local councils and non-governmental organizations will help ensure appropriate and collective decisions. Further, public consultations and information dissemination, which ensures public understanding of a project's impacts and allows the people, to express their voices, are also important parts of this framework.

Stakeholder consultations and community participation provide for the timely information dissemination to the project-affected people (PAP's), as well as the potential beneficiaries. This is a specific requirement of the Environment Protection Agency (EPA). Care should be taken to maintain transparency of the sub-projects, reduce potential conflicts, minimize the risk of project delays, and enable the sub-projects to design the project's various elements as a comprehensive development program to suit the needs and priorities of the communities, as applicable.

The indicated community consultations process will help ensure that communities in the project areas are informed, consulted, and mobilized to participate in the ASPIRE its sub-projects, as applicable. It is likely that given the Category B of the ASPIRE, potential social impacts may be minimal.

For meaningful consultations between the borrower and project-affected groups and local NGOs on all Category B projects proposed for IDA financing, the borrower provides relevant material in a timely manner prior to consultation and in a form and language that are understandable and accessible to the groups being consulted.

Any separate Category B EA report for a project proposed for IDA financing is made available to project-affected groups and local NGOs. Public availability in the borrowing country and official receipt by the Bank for Category B EA report for projects proposed for IDA funding, are prerequisites to Bank appraisal of these projects.

Once the borrower officially transmits any separate Category B EA report to the Bank, the Bank makes it available through its InfoShop. If the borrower objects to the Bank's releasing an EA report through the World Bank InfoShop, Bank staff (a) do not continue processing an IDA project, or (b) for an IBRD project, submit the issue of further processing to the EDs.

Under the ASPIRE project, the ESMF that has been prepared in lieu of EA will be disclosed to public both within Maldives by the PMU on behalf of the GoM and in Infoshop by the Bank. Any subsequent safeguard documents that will be prepared during implementation will be also disclosed in a similar manner.

5.5 Compatibility of Laws and Policies

The following is a comparative evaluation of the Maldives Government and the WB's environmental policies. Table 2 presents a comparison of the Maldives Government and World Bank Policies, Gaps and Recommendations for action.

Table 2: Comparison of relevant Maldives Government and World Bank Policies, Gaps and Recommendations

Category	**Maldives Policy**	**World Bank Policy**	**Recommendation**
A. Environment, Natural Habitat, & Forest including terrestrial and aquatic.	All new development projects should be subjected to EIA under article 5 of environment protection act. EIA screening, scoping, review and decision making are the mandate of Environment Protection Agency (EPA).	Environmental Assessment has to be carried out for projects that have impacts on environment, natural habitats and forests. Identifying potential risks and adverse impacts, mitigation measures and environmental management plan. When natural habitat and forest policies are triggered environmental assessment and environmental management plan (EMP) will adequately	In order to fill the gap between the WB and the Maldives government requirements EIA or an EMP (depending on EPA decision on screening) either shall be prepared for each sub-project during detailed implementation.

Category	**Maldives Policy**	**World Bank Policy**	**Recommendation**
		address the relevant issues.	
B. Physical- Cultural Resources.	There is no specific provision on physical and cultural resources	Environmental assessment (EA) needs to be carried out in case such resources are likely to be affected by the subproject.	ESMF has addressed such issues following the WB policy. The project proponent/Developer will consult with the EPA.
C. Loss of Income Source.	No provisions exist. Common understanding is that compensation shall be provided for loss of property, crop damage or an income source.	Full compensation shall be provided.	Proper grievance mechanisms shall be adopted and implemented.

6 ENVIRONMENTAL AND SOCIAL RISK SCREENING

Any World Bank funded, managed or supported project that is likely to have potential adverse environmental risks and social impacts requires an EA covering the potential risks, mitigation measures and environmental management plan (EMP), and/or environmental and social management framework (ESMF). The main environmental and social safeguards policy to be triggered under this project is OP/BP 4.01 on Environmental Assessment. The significance of the project can be evaluated with the use of the Screening Checklist (see Appendix B) and process included in the following chapter of the ASPIRE ESMF.

Any development activity in the Maldives is also subject to the Environment Act of Maldives and EIA Regulations, which specifies that the EIA process will need to be completed for all projects, except those listed as not requiring an EIA. The proposed project activities in ASPIRE will need to follow through the EIA process.

The proposed Screening Process will help: (i) the specific process to be followed in environmental permit applications to EPA (ii) identify potential environmental and social impacts; (ii) determine appropriate environmental category, following OP 4.01; (iii) review and approve sub-projects; and (iv) identify and mitigation and monitoring indicator measures.

The ASPIRE program sub-projects will be classified as environmental Category B under the WB's criteria, if the expected environmental impacts are largely site-specific, few in number, if any, of the impacts are irreversible, and that mitigation measures can be designed relatively readily. The environmental assessment for a Category B project:

- Examines the project's potential negative and positive environmental impacts;
- Recommends measures to prevent, minimize, mitigate, or compensate for adverse impacts; and
- Recommends measures to improve environmental performance.

It is plausible that some sub-projects may be classified as Category C projects. Environmental screening may be adequate for these projects.

A review of the national EIA regulation (2012) indicates that they are less comprehensive than those of the World Bank. Application of the Bank's Safeguard Policy OP 4.01 to ASPIRE will help ensure the environmental and social soundness of the projects, in addition to integrating the project's environmental and social aspects into decision-making process.

Assigning an environmental category for the ASPIRE sub-projects, based on the Bank's OP 4.01, as indicated above will also fulfill the national requirements under Article 8 of the Maldives EIA Regulations (2012) including the need to screen sub-projects for potential environmental and social impacts. Thus, environmental and social impact assessment for ASPIRE sub-projects will have to be carried out based on the results of the screening process, as shown under *Appendix B: Environmental and Social Checklist*. Notwithstanding this, an assigned category for the sub-projects must meet national legal requirements.

According to Article 8 (b) of the Maldives EIA Regulations, the Screening decision of the EPA may require implementation of simple mitigation measures, development of an EMP or where impacts are potentially significant, further assessment through an EIA. It is expected that smaller projects are going to require only an EMP and the larger projects, involving a group of islands, will require a more detailed EIA.

The Environmental and Social Risk Screening and Management Guidelines are prepared for each of the sub-projects envisaged under the project to ensure compliance with the World Bank and the Maldives Government social and environmental policy framework. The guidelines include parameters for environmental assessment, public consultations and measures to enhance project benefits to communities and women. Together, these guidelines provide the methods to identify the environmental and social problems associated with the implementation of sub-projects and include measures to mitigate such problems as well as enhance environmental and social performance.

6.1 Risk Screening Process

The purpose of the screening process is to determine whether future sub-projects are likely to have potential negative environmental and social impacts; to determine appropriate mitigation measures for activities with potentially adverse impacts; to incorporate mitigation measures into sub-project design; to review and approve sub-project proposals; and to monitor environmental parameters during a sub-project's implementation.

The extent of environmental work that might be required for sub-projects prior to construction, if any, will depend on the outcome of the screening process described below. Also, the checklist may need to be periodically updated, and reviewed and approved by the EPA. The EPA may seek input from the WB before approving the checklist.

It has to be noted that the EPA has specific procedures in place for the EAs in the Maldives. This process is summarised in Appendix C.

Step 1: Environmental and Social Screening of Sub-projects

The initial environmental and social screening will be carried out, in accordance with the provisions of the Bank's Safeguard Policy, OP 4.01, through the use of *Appendix B: Environmental and Social Checklist*. The process can, though highly unlikely, lead to classification such as B1, B2 or C, as indicated below under Step 2. This form will be completed by the ASPIRE's project proponent/developer and copy provided to the MEE/PMU and EPA for review and acceptance of the output.

This form will also provide an initial checklist to complement the EPA Screening Application Form. The checklist has more focussed information related to project characteristics.

The purpose of this step is to identify the scale of the impacts and appropriate mitigation measures to determine the level of EA required for the project. As noted earlier, it is anticipated that the EPA will request an EMP for smaller projects with smaller footprint and limited likely impacts and an EIA for larger projects with wider footprint and higher impacts (See Appendix C).

An application will need to be submitted by the developer/proponent to the EPA along with the checklist and the EIA Screening From.

Step 2: Assigning Appropriate Environmental Category

Based on the screening results and the EIA screening process, the EPA will be responsible for assigning the appropriate environmental category to the proposed sub-projects. Such assignments must be in accordance with the requirements of OP 4.01. The sub-projects need to be filtered through the following Environmental Categories to assure proper categorization.

(a) Category A: A proposed project is classified as Category A if it is likely to have potentially significantly adverse environmental impacts. These impacts may affect an area broader than the sites or facilities subject to physical works. An EIA for a Category A project *would be required*.

The EIA examines the project's potential negative and positive environmental impacts, compares them with those of feasible alternatives, including a no-action i.e. *no-project*, alternative and also incorporates public consultations as per the national EIA regulation requirements. The EIA will recommend needed measures to prevent, minimize, mitigate or compensate for adverse impacts and help improve environmental performance.

The ASPIRE's sub-project (s) will not be assigned under the environmental category A, as a result of the environmental and social screening process.

(b) Category B: A proposed project is classified as Category B, if its potential adverse environmental impacts on human populations and environment are less adverse than those of Category A. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigation measures can be designed and implemented more readily than for Category A projects.

The scope of EIA for a Category B project may vary from project to project, but it is narrower than that of Category A. Like Category A, it examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.

As indicated earlier, the Screening Process will recommend two types of impacts: (i) Category B1 to sub-projects requiring only the application of simple mitigation measures; and (ii) Category B2 for those sub-projects that may require an EIA report due to the severity of their potentially adverse environmental and social impacts. Nevertheless, all potential impacts and mitigation measures must be within threshold of Category B to be considered under the ASPIRE. These categories also correspond to the EPA requirements of either an EMP or an EIA.

(c) Category C: A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further environmental action is required for a Category C project. Such projects qualify for what is popularly called, Categorical Exclusion (CATEX or CE). However, the final decision rests with the EPA, which may in most cases, choose to require an EMP.

(d) Category FI: A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary in subprojects that might result in adverse environmental impacts.

When the screening indicates the need to conduct an EA, and the EPA decides to request an EA, there will be three categories of assessments that will be prescribed. For projects with smaller impacts and limited scale/footprint, an EMP will be required. For projects with unknown impacts, a First/Initial Environment Examination may be required. For the rest, an EIA will be required.

Step 3: Conducting an Environmental Assessment

An EMP is the minimal level of assessment required for a project by EPA. An EMP is also required for Category B projects. An EMP covers information about the project and management plans for the likely impacts including mitigation measures, monitoring programme, identification of responsibilities, reporting and financing environmental management. An outline for requirements of an EMP is presented in Appendix E.

For EIAs, the EPA will decide the scope of the study and will inform the developer/proponent by way of a Terms of Reference (ToR). The ToR is agreed in a scoping meeting held between the developer/proponent, EPA and all the relevant stakeholders.

The EIA must be prepared by a registered EIA Consultant and, according to the EIA Regulations and circulars issued by EPA. Templates for the EIA based on the regulations and World Bank requirements are provided in Appendix D.

The completed EIA should identify and assess the potential environmental impacts for the applicable sub-project, assess alternative solution and included mitigation, management and monitoring measures, as applicable. All these measures should be included in the Environmental and Social Management Plan (ESMP) for the sub-project.

Step 4: Review and Approval of EIA

Completed EMPs will have to be submitted to EPA and approved, before going ahead with the project.

If the need to develop an EIA arises, the completed EIA document will have to be submitted to EPA who, in consultation with MEE and other relevant agencies will make decisions—accepted, rejected, or need more work—and inform the City or Island Councils and WB authorities, followed by appropriate action.

A Decision Note will be issued by EPA to commence work.

Step 5: Public Consultation and Disclosure

Public consultations are critical in preparing effective and sustainable ASPIRE sub-projects. This requirement supports the participatory planning process as required by the WB and the national EIA regulations. Under the decentralization act of the Maldives, it also applies to island councils and city councils when sub-projects covering islands are being identified. It is important that beneficiaries are involved in the project cycle, from the design to implementation and monitoring. The same applies to relevant stakeholders including: the city or island where the sub-project is located.

The first step, for the developer/proponent, in this process is to hold public consultations with the local communities and all other interested/affected parties during the screening process and where needed, when preparing an EIA. These consultations should identify key issues and determine how the concerns of all parties will be addressed, and if an EIA is required include it in the ToR, for the EIA for a sub-project.

To facilitate meaningful consultations, where required, the City and Island Councils should be provided with all the relevant material and information in a timely manner, and in a form and language that are understandable. Also, location of the relevant documents should be advertised through commonly used media. Depending on the public interest in the potential impacts of the sub projects, a public hearing may be required to better convey concerns.

Once the sub-project has been reviewed and cleared by the relevant local community, including the Island/City Council, the EPA will inform the public about the results of the review. It is important to note that any affected or interested individual or group has the right of appeal, if dissatisfied with the decision reached at any stage in the EIA process. The appeals process will be according to the national EIA regulations and the WB's provisions respectively. The developer/proponent should seek guidance from the MEE, if needed.

Step 6: Monitoring and Reporting

The objectives for monitoring are: (i) to alert project authorities by providing timely information about the success or otherwise of the EIA process as outlined in this ESMF in such a manner that changes to the system can be timely made, if required; (ii) to make a final evaluation in order to determine whether the mitigation measures designed into the sub-projects have been successful in such a way that the pre-subproject environmental and social condition has been restored, improved upon or are worse than before.

Environmental monitoring needs to be carried out during the construction as well as operation and maintenance of the ASPIRE sub-projects in order to measure the success of the mitigation measures implemented earlier. A number of indicators would be used. Indicators may include: how many people are employed than before; have the biophysical environmental conditions of the area improved?

It may be useful to institute monitoring milestones and provide resources, as necessary, in order to carry out the monitoring activities. Also, the proposed indicators may be further elaborated and validated to accommodate any significant site-specific needs, in each case with input and oversight of the EPA.

Monitoring activities in the field will be carried by EPA designated, qualified persons. Monitoring results will have to be discussed by MEE/PMU before submitting the results to EPA. Any changes in monitoring parameters must have the concurrence of the EPA and the MEE/PMU as well as the concerned City/Island Council.

Step 7: Monitoring indicators

The following are some of the pertinent parameters and verifiable indicators that can be used to measure ESMF process, mitigation plans and performance.

- Have project resulted in better living standards for the community?
- How has the adoption of the ESMF requirements improved the environmental health and biophysical state of the participating islands?
- Has ESMF adoption resulted in sustainable use of energy and improved efficiency?
- Are periodic monitoring reports being completed and sent to EPA?
- Are processes defined in the ESMF working well?
- How many complaints/grievances have been received regarding the project?
- Final Question: Based on the results of monitoring, what, if any changes to the ESMF are needed? Should there be additional training/capacity building measures to increase performance of participating including Councils?

7 BIOPHYSICAL AND SOCIO-ECONOMIC BASELINE

The following baseline assessment has been conducted to understand the biophysical and socio-economic condition of the phase I sites.

7.1 Population

Male' is the most populated and the fastest growing island in the Maldives. In 2009, there were an estimated 109,494 people living in Male' (DNP 2012). The population of Male' increased by 29,624 (40%) between 2000 (74,069) and 2006 (103,693) (DNP 2008) passing the 100,000 threshold for the first time. In 2006, 35 per cent of the Maldivian population were living in Male'. The population of Male' has been growing at the rate of 5.59 per cent per year (DNP 2008). During the same period the population in the rest of the country decreased by 757 (-0.3%).

The high population growth in Male' is due to high levels of inward migration from atolls in search of jobs and education. In 2006, the proportion of migrants in the Male' population (residents who were born elsewhere) has reached 53%, a steady increase from 45% of migrants in 1995. In 2006, about 49.6% (48,691) of all lifetime migrants in the Maldives were enumerated in Male' (DNP 2008)

It is also estimated that there are more than 100,000 migrant labourers in the Male' Region, mostly workers from Bangladesh. Most of the expatriate workforce is in the construction sector. More than 75% of the workers in construction industry constitute of migrant workers (ILO 2013). Migrant workers continue to add to the population pressure in Male'.

7.2 Housing and land resources

In 2010, there were a total 15,637 households in Male', with an average of seven people living in every household. Of the households in Male', 52 per cent (8,138) live in rented houses. High levels of migration to Male' have led to escalating house rents, and extreme congestion in Male' (DNP 2012).

Male' has one of the highest population densities in the world. The original land area of Male' covered about 100 hectares and Male' had only 13,336 people with a density of 133.36 persons per hectare in 1969 (MHAHE 2002). Since 1970s, the population of Male' started increasing dramatically and to meet the additional housing demand a land reclamation programme was initiated in the late 1970s. Through this reclamation programme the land area of Male' was almost doubled to 197 hectares (DNP 2011). But even with the doubling of land area the density has reached nearly 525 persons per hectare in 2006 (DNP 2011). For comparison, the three

largest cities ranked by population density are Mumbai with 296 persons per hectare followed by, Kolkata 239 and Karachi 189 (MED 2013).

The extremely high population density in Male' is a major sustainable development challenge. Severe land shortage problem in Male' is further compounded by the sub-division of plots of land because of land inheritance patterns. Male' City Council restricts subdivision to a minimum plot size of 55.74 m2 but in the past there have been instances of plots divided into 35 m2. Male' City Council regulations also restrict height of buildings to a maximum of 14 floors. Male' has extremely narrow buildings rising to several floors and clusters of overcrowded sub-standard small housing units.

7.3 Bio-physical resources

Male' has been reclaimed to the maximum extent of the reef. Due to reclamation, Malé has lost its natural lagoon, reef flat and beach system. In April 1987, a storm centre in the southern Indian Ocean caused long distance wave transmission (MPHRE 1994). The waves caused enormous economic losses through damage to infrastructure, reclaimed land and vegetation in Male'. As a response measure *tetrapod* structures were placed around Malé for prevention of sea swell flooding.

The high demand for housing construction and high population density has caused dramatic deforestation of natural island vegetation. The reduced vegetation and high number of buildings on the island causes reflection and refraction of solar radiation leading to increase of ambient temperature on the island, when compared to naturally vegetated islands.

One of the attractions of Male' for original settlement was the deep and extensive freshwater aquifer (MPHRE 1994). However, the increasing population has resulted in progressive depletion of the aquifer, as well as contamination due to sewage leading to the installation of desalination plants to supply metered piped water to the households of Male'.

7.4 Villingili

In the context of the specific population density problems in Male', Villingili in the vicinity of Male' has been developed as the fifth ward of Male'. A UNCHS/UNDP Villingili Island Development Plan was prepared and Villingili is being developed as a garden island with no cars and motorcycles. Villingili is situated west of Malé, and east of Gulhi Falhu, separated by narrow channels. Villingili, once a tourist resort island, is now a residential island with about 500 houses. Villingili maintains features of the natural small tropical island environment of the Maldives, such as the beach and the natural vegetation. Due to extensive erosion, several groynes have been constructed to protect the beach.

7.5 Hulhumalé

Hulhumale' Land Reclamation and Development Project is the second priority project initiated by the Government to address the congestion issues in Male'. Hulhumale' is the largest land reclamation and development project ever undertaken in the Maldives. The island was reclaimed to an elevation of 2 m above mean sea level as an adaptation measure to the predicted sea level rise. Hulhumalé is now a satellite city to the capital Male' and has both residential and commercial development. As the whole of island was reclaimed on a lagoon, Hulhumalé does not have an established natural ground water aquifer.

7.6 Gulhifalhu

In September 2010, work began on reclamation of Gulhifalhu lagoon near Male' to provide for residential and light industrial development. In the first phase of reclamation, 10 hectares of land was reclaimed (Haveeru Newspaper 2010). Gulhifalhu is a ringed reef located on the southern rim of North Male' Atoll with Thilafushi to the west and Vilingili to the east. With a width of about 1.6 km and roughly 2.8 km in length, Gulhifalhu Reef is one of the largest reef system in the Male' Urban Region with a total surface area of approximately 365 ha. Gulhifalhu is in close proximity to Viligilli Island (0.4 km), Thilafushi Island (0.3 km) and Male' (2.5 km). The nearest resorts are Giraavaru Island Resort (5 km) and Kurumba Maldives (6.7 km).

7.7 Income and livelihoods

Households in Male' earn on average MVR 28,909 with average income per earner of MVR 10,132. Households in Male' have on average 3 income earners (42% of the average household) per household. The average monthly income for households in Male' are 42% higher than that of the national average for household income (DNP 2012).

Urban poverty has worsened in recent years in Male' (DNP 2012). While headcount ratio at the national level for Rf 22 declined from 21% in 2003 to 15% by 2010, the headcount ratio in Male' increased from 4% in 2003 to 12% in 2010. The indicators of depth of poverty also shows that the poor in Male' have become poorer. In Male', the poverty gap ratio relative to the poverty line of Rf 22 increased from 1% in 2003 to 3% in 2010. Not only did the condition of the poor get worse, there is rising inequality in Male'. The Gini Coefficient for Male' increased from 0.35 in 2003 to 0.45 in 2010 (DNP 2012).

Expenditure for households in Male' is on an average MVR 19,456, of which the largest share (33%) of expenditure is on *housing, water and electricity*. Of this 22% is spent on *housing rent* alone, whereas households in the atolls spend only 1% of expenditure on rent. The percentage

share of expenditure spent on food and beverages by households in Male' (17.5%) are less than households in the atoll (25.4%) (DNP 2012).

Although 35% of the population live in Male', 46% of the total national household expenditure is in Male'. Of the national household expenditure, the richest people in Male' spends 18% of the total national household expenditure' while 3% is spent by the poorest people (DNP 2012).

7.8 Political and social structures

Male' is the administrative and the financial capital of the Maldives. The President's Office, the Parliament House, the Supreme Court, government administrative buildings, police, defence force and the country's best infrastructure for health and education are all located in the capital Male'.

The Greater Male' Region was declared as a city under Decentralization Act (7/2010), ratified on 17 May 2010. Annex II of Act 7/2010, defined the broad criteria to be used in giving city status to administrative areas. According to Annex II, for an administrative area to be given urban/city status, the area should have a minimum population of 25,000; have certain minimum standards of urban services defined by the Local Government Authority; and exceed the economic productivity target set by the Local Government Authority. Based on the results of a public referendum, and the criteria set by the Local Government Authority, the President declared Male' the capital and Addu Atoll as having "City" status.

There are 11 members in the Male' City Council, elected based on electoral voter percentage for a 3-year term. The members represent Maafannu, Henveiru, Galolhu and Machchangolhi wards in Male', as well as the satellite settlements of Villingili and Hulhumale'. The Mayor and Deputy Mayor of the City Council are elected through a vote within the elected council members. Elections were held for the first term of Male' City Council during the local elections held on 05 February 2011. The second term of the Male' City Council began with the sworn in ceremony on 26th February 2014 following elections held on 18th January 2014.

7.9 Cultural and historical resources

The Hukuru Miskiyy, (Friday Mosque) built in 1656 with its finely fluted coral block walls, and intricately engraved beams, Medhu Ziyaraiy, Bodu Thakurufaan Ziyaraiy, Eid Mosque, Kalhuvakaru Mosque, Mulee-aage, the current Presidential residence, built right before the First World War and overlooking the Friday Mosque; the Islamic Centre that was built in 1984 with its geometric stretch of white steps leading up-to the grand mosque; the sultan park, the national museum, Dhaarul Uloom, Majeediya School, and Aminiya School are among the City's main heritage and cultural attractions.

7.10 Electricity usage

In 2013, the annual electricity produced in Male' was 224,562,324kWh while 8,543,892 kWh were produced in Villingili and 14,060,280 kWh in Hulhumale'. The daily peak load in Male' reached 40,761kW with the peak load time at 12 in the noon. Male' has a total installed total power generation capacity of 61,420 kW (MEE 2014).

Table 3: Summary of electricity production and usage in Male' Region, 2013.

Location	**Male'**	**Villingili**	**Hulhumale'**
Daily peak load (kW)	40,761	1,545	2410
Peak load time	12:00	7:00	9:00
Installed capacity	61,420	2800	5600
Monthly average usage (kWh)	18,713,527	711,991	1,171,960
Yearly production (kwh/yr)	224,562,324	8,543,892	14,060,280
Oil consumption (l/yr)	62,492,521	2,571,506	4,265,144
CO2 emission (tCO2)	166,380.00	6,846	11,355.00

The Government of the Maldives provides electricity and fuel surcharge subsidies for all households in Male'. In the month of June 2012, the Government spent MVR 3,274,676 for electricity subsidy and MVR 13,902,776 as fuel surcharge subsidy for Male' households. In Male' there were 22,493 households that received both government subsidies for electricity and fuel surcharge subsidy (DNP 2013). Thus it is estimated that the Government would have spent more than MVR 200 million to subsidise electricity usage in Male' in 2012.

7.11 Health

Indira Gandhi Memorial Hospital (IGMH) in Male' is the only publicly owned tertiary hospital in the country. In addition there are 2 more private hospitals in Male' offering tertiary care. There are several private clinics offering secondary care services in Male'. Maldivian citizens have free health insurance coverage through Aasandha health insurance scheme with universal coverage up to an annual cap of MVR 100,000.

7.12 Education

According to the Maldives School Statistics 2013 (MOE 2014) there are total 36 schools in Male'. Of them 13 are government owned schools, 19 private owned schools, and 4 community owned schools. In 2013 there were total 27,191 students registered in schools in Male'. There are 1,878 teachers teaching in schools of Male'. Of them 1088 are female local teachers, 349 male local teachers, 178 female foreign teachers and 263 male foreign teachers. The student teacher ratio for schools in Male' is 14 (MOE 2014).

7.13 Hulhulé

Ibrahim Nasir International Airport is located at Hulhulé. The island within 15 minutes boat ride from the capital is identified as one of the key gateway of the Maldives. The island, becomes the very first image of the millions of tourist visiting the Maldives. The island had undergone reclamation, hence it is being exposed to different and varied vulnerabilities. The location of infrastructure within close proximity to the coastline makes them highly vulnerable to sea level rise and storm conditions. About 30% of the infrastructure of Male' International Airport lies within this range and additional land reclamation done on the island towards the ocean-ward side has resulted in parts of the island being within 15 m of the wave break zone (Shaig, 2006).

7.14 Thilafushi

Thilafushi is located approximately 400 m from Gulhiflhau and 6.85 km from Male'. Although originally Thilafushi was a lagoon of about 3.5 km in length, currently it has a landmass of approximately 0.5 km^2. The primary purpose of reclaiming Thilafushi was to resolve the issue of waste on Male' and has been in use for landfilling for the last 20 years. As part of the waste management operations, the barge carrying waste travels, on average five times a day, between Male' and Thilafushi . Since 1997 the reclaimed land of Thilafushi is being utilized for industrial purposes. Current land use of Thilafushi includes cement packing, LPG bottling, boat manufacturing and warehousing.

8 PUBLIC AND STAKEHOLDER CONSULTATIONS

For all Category A and B projects, during the EA process, the project proponent/developer is required to consult project-affected groups and local nongovernmental organizations (NGOs) about the project's environmental aspects and to take their views into account. The project proponent/developer shall initiate such consultations as early as possible.

8.1 Stakeholder and Public Consultations

During the design and the formulation of the ASPIRE stakeholder consultations were conducted extensively. The following stakeholders were consulted in the preparation of the ESMF. The stakeholders consulted include:

- Ministry of Environment and Energy;
- Energy Department;
- Environment Department;
- Project Management Unit (PMU);
- Environment Protection Agency (EPA);
- Maldives Energy Authority (MEA);
- Hulhumale' Development Corporation (HDC);
- STELCO;
- Culture and Heritage Section (Ministry of Youth and Sports);
- Aminiya School;
- Billabong High International School;
- Youth Center;
- Renewable Energy Maldives;
- SWIMSOL;
- Mookai Suites.

Public consultations were held with residents of Male', Villingili, and Hulhumale' between 16 and 17 March 2014.

8.2 Key findings of consultative process

The stakeholders consulted and the consultation notes are presented in Appendix A. A summary of the consultations are provided below in Table 8.1.

8.2.1 Public acceptance

All the members of the public who were consulted welcome roof top solar PV. The overwhelming reason for the public acceptance is their perception that roof top solar PV is good for the environment. Some members of the public believe that it will reduce electricity costs and lead to more energy saving. The residents perceive that solar PV is a very good initiative that will save on the energy bill. The perception is that solar PV is a cheaper form of energy will save a lot of money spend on electricity at present. Everyone needs it and solar PV is environmentally friendly and safe. Some expressed that solar PV installation is a very good thing to do to become carbon neutral by 2020. Solar PV will reduce the emission of carbon dioxide and is a better option than burning fossil fuel. Public is of the view that solar PV is a very good green technology will not produce sound or smoke like the present diesel generators. Solar PV uses natural energy and the abundant sunlight in the Maldives makes it ideal for the country. Some are of the view that it is a fancy, fashionable thing that will save the environment.

8.2.2 Existing solar projects

There are lessons to be learned from the existing solar PV projects. In the Male' area, solar panels have been installed in some selected schools, Youth Centre in Male', President's Office, Velaanaage Office Building, Mulee-Aage Presidential Residence and STELCO building. Solar rooftop PV has been installed in Edhuru Vehi and the school of Villingilli. Solar street lights were installed in Hulhumale'. The current installed solar photovoltaic capacity in Male' is 675kW. The solar panels belong to the Ministry of Environment and Energy and STELCO purchases from the Ministry.

All solar energy produced by REM is currently purchased by STELCO. The agreement is for 20 years. STELCO purchases from the producer at a pre-agreed rate.

The present solar photovoltaic installations do not have battery backup. Battery backup would increase the usefulness and efficiency of the solar panels. However, batteries are still very costly. It is estimated that USD 4.5 million is needed for 1 MW of battery, which would run for 7 hours continuously. At least five MW battery is needed in Male' for increasing efficiency and to cut down fuel costs. Rakeedhoo Island is going 100% on renewable energy using solar photovoltaic with the use of battery under ADB loan assistance program.

8.2.3 Procedures and process

The proposed scope of works for the ASPIRE program would mainly require an Environment Management Plan. However, the use of EPA specified screening forms for each project shall be mandatory and possibility of a full scale EIA should be open. Although the EIA Regulations does not specify a Decision Note for an EMP, Decision Notes can be provided for the ASPIRE program EMPs. The EMPs for ASPIRE should be checked and signed by a registered EIA consultant.

All ASPIRE programs that go beyond rooftop solar PV installation must be considered as individual projects and undertake the environmental impact assessment process as stipulated by EPA.

8.2.4 Standards for Solar PV installations

MEA does not have specific technical standards for sourcing, installing and maintaining solar PV units. MEA shall consider developing a guideline for approving solar PV projects, which EPA could use as reference in ensuring minimal safety and social impacts. A licensed engineer shall attest that all electrical workings are up to the required standards.

8.2.5 Cutting down of trees and pruning

ESMF shall address the cutting down or pruning of protected trees. This would be an important issue in Villingilli. The Screening Form shall be used to screen out work at sites with thick vegetation.

8.2.6 Cultural, religious and historic sites

Male' has some of the most important cultural, religious and historical sites. Special attention must be given to ensure that no adverse impacts on the aesthetic and historic value of these sites. The selected buildings and sites for the solar PV installation will have to be communicated with the Culture and Heritage Section located in the National Museum building. Thereafter they shall evaluate the building or site to check if it falls under any heritage criteria. The Culture and Heritage Section have a list of List of Archeological and Heritage sites. But the list keeps on changing. They do not have exact information of all the heritage sites in the Maldives as they are under staffed to do proper monitoring in the islands.

8.2.7 Changes to buildings

Issues relating to the construction of new buildings next to existing project roofs were discussed. It was agreed that it is not possible to control the new construction or changes to land use and that this would be a risk to the project.

8.2.8 Challenges for roof top solar PV success

The challenges for roof top solar PV in Male' mentioned by the public include: no space in Male' for such a project, limited roof available, high initial capital costs, solar panels are expensive, high installation costs, large investment required, will not be affordable to many, some buildings may block sunlight, building designs are not compatible for solar PV, difficult to use at individual household level, solar panels take space, difficulty in maintenance and service, no mechanisms to dispose waste and batteries after expiration. Public and stakeholders identified several challenges for RE by photovoltaic in Male' region.

The challenges identified by stakeholders include:

a) There aren't many buildings with large roof space available in Male'

b) There are no guidelines for using a private residential/hotel roof.

c) The roof quality of the existing building needs to be assessed. Full roofing might need to be changed to ensure longevity for the life time of solar panel installation.

d) Buildings are continuously being demolished and newly constructed. Hence building roof availability and duration needs to be guaranteed.

e) Shadow over cast is an issue and has to be assessed for the selected buildings based on future developments around the area.

f) Energy security issues need to be resolved by formulating strong regulations on guaranteed power selling, if private investors are involved.

g) Grid stability is an issue if there are multiple private investors. Proper monitoring should be undertaken and STELCO should be informed in advance on how much each investor will be produced and sold.

h) If different investors can come at different points and work is pending without progress, the investors next in line may face disadvantages.

i) The generators at STELCO need to be sized properly. The desired fuel saving results will be seen when STELCO is able to switch off at least one generator and run a minimum of 1MW fully on solar energy.

8.2.9 STELCO interested to invest

STELCO is interested in investing in solar energy production. They have the administrative structure, fully functional office as well as technical expertise. However, it becomes difficult for them, as they are a 100% government owned company under the authority of Ministry of

Finance and Treasury. Hence they face difficulties in securing finance for RE projects and in decision making.

8.2.10 Access to products locally

One of the main challenges identified by the public is that solar panels and required accessories are not available in shops in the Maldives to buy, solar panels need to be purchased from other countries, the weight of solar panels, and high freight costs, no organized import of solar panels, lack of information on prices, no installation guidelines and lack of private companies in the RE sector.

8.2.11 Legal Aspects

One of the biggest challenges facing RE projects in Maldives is the lack of a legal framework to undertake large scale projects. The most important are the issues related to roof ownership. At present, it is possible to enter into individual roof lease agreements but there is no legal guarantee that these agreements can be maintained in the long term. Added to this is the large number of roof lease agreements that may be involved in each of these projects. Without the proper legal framework, managing all these agreements will be a big challenge.

8.2.12 STELCOs ability and Willingness to Purchase

There are cases where technical and administrative issues identified by STELCO have prevented the off-take. There needs to a clear policy and agreement from STELCO to purchase power from Solar PV. There is also need for standard Purchase Agreement to be signed with STELCO.

8.2.13 Local company preference

More preference needs to be given to local companies in the ASPIRE program. Most local SMEs would not be are unable to compete with big multinational companies. Giving preference to local SMEs would assist innovation and employment in the field and make these programmes more sustainable.

8.2.14 Grievance Mechanism

There is a need to minimize potential corruption in selection of developers, disputes with STELCO, guarantees from World Bank and roof lease agreements. World Bank involvement is required in evaluation of the bids and to ensure transparency in the process. The grievance mechanism should involve the World Bank.

8.2.15 Proposed solutions

The solutions proposed to address challenges include: encouraging people living on top floor of buildings to invest in solar, strengthening of the economy to enable people to earn more and spend for RE, to audit the available roofing, revise housing designs for upcoming projects in

Male', make more people aware of the long term value of investment, to explore public private partnership, government subsidies, long term repayment options, bring in foreign investments, support to local businesses, and installation of panels in the lagoons. Public is of the view that Government needs to play an important role to enable and should devise multiple options to support the public and to provide solar panels at a cheap price.

The proposed solutions for the issues also include giving a major role to STELCO. The public also wants the Government to solve the issues related to the project quickly. The overwhelming view is that unity and community cohesion is essential for the success of such projects.

There is a need to get the small and medium enterprises interested in RE projects and to set up a regulatory framework such that private companies can invest in providing services to households similar to the present cable and satellite TV services.

8.3 Future consultations

During pre- and implementation stage, the ASPIRE project proponents/Developers will do further consultations with the public, key agencies of the government and non-governmental organizations. The EPA will provide project proponents the specific requirements of the public consultation process.

Public consultations to be conducted by the project proponents as required by EPA is likely to include city/island councils, as applicable, non-governmental organizations, businesses and community members, and the properties in the immediate vicinity of the proposed site. Mechanisms of consultation and participation will include:

- Public meetings in the project areas;
- Information dissemination/ public awareness campaigns
- Interviews/brief surveys of project affected households/properties;
- Focus group discussions; and
- Development of grievance redresses mechanism in the project premises.

For consultation mechanism to be effective, the participation of different stakeholders is important. Island Councils, City Councils, Non-Governmental Organizations, community members and surrounding households/properties should be contacted as early as possible to seek cooperation and participation during the project planning and implementation stages.

Women, in particular, will be requested to participate in the meetings and express their concerns about the various aspects of the project, informed about the outcome of the decision-making process, as well as how their views were incorporated. .

Table 8.1: Summary of consultations

Date	Stakeholder	Participants	Issues Discussed	Projects Response
10/3/2014	Environmental Protection Agency	Mohamed Rameez Siyama Saleem Akram Waheed Shazma Naseer Mariyam Rifga Aminath Haifa Riffath Naeem	• The proponent for the project • The potential expansion of scope • MEA does not have specific technical standards for Solar PV units • Construction of new buildings next to existing project roofs	Proponents will be private sector investors who develop sub-projects Where scope extends beyond project specification given in ESMF, an EIA has to be prepared according to EPA regulations. MEA to deliberate on technical guidelines and specifications for roof top solar installation in the Maldives Ministry of Housing and Infrastructure to be informed of all project roof top locations, so that any issues can be addressed early
13/3/2014	STELCO	Abdul Malik Thaufeeg Ahmed Iqbal Ahmed Saif Ibrahim Nashid Azzam Ibrahim	• Less buildings with large roof space available • No guidelines for using a private residential roof • Roof quality of existing buildings • Building roof availability and duration • Shadow over cast • Energy security • Grid stability • If work is pending without progress, Investors next in	Standard roof use agreements to be drafted Investors to be given information about lessons learned from STELCO/JICA solar project. MEA to ensure access to information and transparency in decision making with regard to ASPIRE program

Date	Stakeholder	Participants	Issues Discussed	Projects Response
			line may face disadvantages • Existing legal framework is weak • Size of STELCO generators • Difficulties is securing finance for RE as they are a 100% Government owned company	
10/3/2014	Renewable Energy Maldives	Hudha Ahmed Abdul Rahman Ali	• Lack of legal Framework • Roof ownership • No guarantee on long term agreements • Need of standard purchase agreement with STELCO • Strong reservations on how the current bidding process is run • Potential corruption in selection • Dissatisfaction with limited direct benefits to roof lessor • Maintenance is difficult and expensive • Proposed feed-in method may become dominant	Standard Power Purchase Agreements to be drafted MEA to ensure access to information and transparency is adhered to in decision making WB to ensure grievance mechanism is sound Conduct a public information and awareness campaign
16/3/2014	Aminiya School	Mohamed Naseem	• No information on project was communicated	Ensure all stakeholders are fully informed about project components
13/3/2014	Hulhumale' Development Corporation	Hussain Ziyath Ahmed Sofwan Khadheeja Mohamed	• No formal government policy on private installation • No regulations mandating	Finalize policy on net-metering and conduct public information and awareness

Date	Stakeholder	Participants	Issues Discussed	Projects Response
			individual developers to use solar panels in construction of buildings	Government to develop guidelines and standards for private individual solar photovoltaic installations
11/3/2014	Billabong High International School	Ibrahim Shaeeq	• Current rules and regulations on renewable energy is discouraging • No way for people to feel the impact	Finalize policy on net-metering. Conduct public information and awareness programs
9/3/2014	Culture and Heritage Section	Zaha Ahmed Asiyath Mohamed Afsal Abdulla	• Do not have exact information of all heritage sites • Heritage sites list keeps changing	Ensure that project proponents consult the Heritage Section at an early stage of sub-project development
	Youth Centre/Social Centre	Amy	• No information regarding solar panels installed at Youth Centre	Conduct a targeted stakeholder information sharing program
	SWIMSOL	Shifna Saeed	• Weak legal framework • Regulations and guidelines for RE are not clear • Limited roof space available • Rented apartments with separate meter readings	Develop standard power purchase agreements Develop standard agreements for roof top use
17/3/2014	Male' Public Consultation	Ahmed Nasih Shuaib Mohamed Mair Ali Haisham Aminath Insha Sharif Mohamed Ali Siraj Mohamed Ahsan Ibrahim Musthafa	• No space in Male' • Limited roof area available • High installation costs • Large investment required • Not affordable to many • Buildings may block sunlight • Building designs are not compatible for Solar PV	Provide easily accessible information to public on household energy audits Provide information to public on solar photovoltaic equipment market cost and installation costs in the Maldives Develop standard agreements for roof use

Date	Stakeholder	Participants	Issues Discussed	Projects Response
		Ibrahim Mohamed Asif Shahid Abdulla Nahid Adam Moomin Abdulla Rifau Mohamed Shafaau Imdhaadh Zaki Mariyam Naif Ali Shareef Arif Mohamed Ali Bunyaameen Mohamed Nabeel Habeeb Mohamed Aminath Areef	• Difficult to use • Solar Panels take up space • Difficulty in maintenance and service • No means of disposing waste and batteries	
17/3/2014	Hulhumale Public Consultation	Agleem Shaheedha Zahura Shazr Hamdhoon Zahir Ali ihusan Husham Ali Mariyam Ali Fayaz Farhaan Leesha Mariyam Hassan Irfan Saidha Hamdhaan	• Solar PV is expensive • Solar PV is difficult to install • Public sector debts are very high • STELCO might have issues due to drop in revenue	Provide easily accessible information to public on household energy audits Provide information to public on solar photovoltaic equipment market cost and installation costs in the Maldives

Date	Stakeholder	Participants	Issues Discussed	Projects Response
		Azeeza Ibrahim Aisha Ibrahim Zahir Sharafiyaa Yaasmeen Saadhaa Shareef Ziyaadh Mariyam Dhimasha		
16/3/2014	Vilingili Public Consultation	Mohamed Ahmed Mohamed Hassan Ibrahim Hussain Manik Rimah Ahmed Mariyam Zoona NIuma MOhmed Hassan Mohamed Mariyam Manikfaan Ahmed Raoof Ahmed Dhain	• Solar panels are not locally available • Heaviness of solar panels • High freight costs • No organized import of solar panels • Lack of information on prices • No installation guidelines • Lack of private companies in RE sector	Provide easily accessible information to public on household energy audits Provide information to public on solar photovoltaic equipment market cost and installation costs in the Maldives

9 OVERVIEW OF POTENTIAL ENVIRONMENTAL AND SOCIAL ISSUES OF THE ASPIRE PROGRAMME

9.1 Air emissions

ASPIRE sub-projects will be renewable energy (RE) projects. RE projects are cleaner energy generation options than the diesel powered generators used for electricity production in the islands of the Maldives. The zero dependence on imported fossil fuels and the consequent reduction in the emission of greenhouse gases (GHG) make RE options preferred choice. CO_2 emissions from the proposed roof top solar PV are much lower than that of diesel or natural gas based energy generation.

Although roof top solar RE projects will be emission free in the Maldives, it must be noted that some GHG emissions are embodied in renewable technologies caused by the fossil fuel sources used in the production and manufacturing of equipment, waste disposal and recycling. However, these life-cycle emissions are significantly lower than those coming from diesel generated electricity and the project will have little control over the process, as already manufactured material imported will be used in the project.

One of the aims of ASPIRE is contain and reduce GHG and other toxic emissions conventionally associated with energy products. A key impact of solar farms is emissions from solar energy projects if the sites are located in land with vegetation. Any vegetation/trees with potential of affecting shade and physical obstruction has to be cleared resulting in release of GHG from the project otherwise sequestered in the vegetation. Since the ASPIRE project involves only roof top PV, it is unlikely that there will be air emissions from the project.

9.2 Noise emissions

Compared with wind energy and other forms of renewable energy, there will be no noise emissions from roof top solar PV. However, the construction stage may involve increased noise and disturbances to surrounding properties and the project site residents.

9.3 Chemicals

Apart from GHG emissions, mercury and cadmium emissions are associated with solar energy. These elements are used in making solar modules. However, there is no evidence that these elements get released from solar panels, except during disposal.

9.4 Heat or Light Reflection

Neighbouring properties may be affected due to sunlight reflection from the panels, if the panels are angled towards windows, doors or a balcony. If the reflection affects the neighbours for a prolonged period of the year, it may become a source of grievance.

9.5 Impacts on biodiversity

Roof top solar PV will generally not have any adverse impacts on terrestrial or marine biodiversity. Furthermore, the proposed projects are in Male' urban region where there are very few if any recorded fauna. However, of the adjoining properties have trees that obstruct the use of solar panels on the target building, the owner of the building, under General Laws Act 4/68, may be able to prune or cut down the obstruction, after a legal proceeding. Given this provision, there is potential for impacts of vegetation cover and possibly on protected species and trees.

These scenarios are expected to be minimal in Male' Urban Region, due to the higher buildings and lack of vegetation cover. The chances of this situation arising in Viligilli Island Ward (Part of Male') and outer islands are much higher.

There are possible impacts to biodiversity unless appropriate national guidelines and processes are put in place on the disposal of material at the time of decommissioning.

9.6 Cultural Heritage

There are culturally sensitive buildings in the Maldives that may become a source of public resentment if used for solar panel installation. These include places like mosques, cultural or historical buildings and cemeteries. It will be important to ensure that the proposed projects do not have an effect on a place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical or social significance or other special value for present and future generations.

9.7 Employment

ASPIRE roof top solar PV program is a source of temporary and permanent employment. Roof top solar PV will generate both technical and unskilled jobs. Solar PV will generate jobs in design, installation, operations and maintenance, project development and marketing. The Maldives needs to generate new jobs that match the aspirations of young people and RE is one source of jobs that will be attractive to young people. Hence ASPIRE will help address youth unemployment and contribute to social and economic development in the country.

9.8 Economic impact and livelihoods

ASPIRE roof top solar PV program is aimed at reducing the cost of electricity production in the Maldives and improve energy security. Hence, at the household level the project is likely to result in cost savings, improve standard of living, increase income levels of households, and increase property value in the project location. At the level of businesses, the project may lead to re-organisation of supply chains which could have overall positive impacts. At the national level, in the long term, the ASPIRE project is likely to reduce the economic dependency of the Maldives on imported diesel, reduce national debt, and increase overall economic resilience.

9.9 Social Conflicts

Potentially adverse social impacts are likely to be minimal, and like environmental impacts, manageable. Such potential impacts may include: fairness and equity of decision making process, the non-use of local resident qualified manpower during the construction of the infrastructures. This could cause some frustrations and social tensions at the local level, potentially leading to social conflicts. To the extent possible, employment of locals should be encouraged. This will also encourage local buy-in of the project and its activities under implementation.

Poor maintenance, following construction completion, may lower intended impacts in the community resulting in disillusionment with such projects. This may occur due to a lack of funds, negligence of staff, poor supervision, or failure during the monitoring stage.

On the positive side, construction works under the ASPIRE can contribute to creating jobs where the work is initiated. It can increase local employment and hiring of skilled workers—masons, carpenters, building workers, plumbers, electricians, and others. Increased employment will help increase the incomes of the local populations, improve their living conditions, and contribute to the fight against poverty.

The used of community buildings may also be a source of conflict and resentment, if there are no direct benefits received to the community from presence of the panels. Such incidents are known to have occurred in other similar projects such rainwater harvesting projects.

9.10 Safety, occupational safety and health issues

The availability and use of personal protective equipment would need to be closely monitored continuously during both the constructional and operational phases. The contractors should properly sanction all employees who refuse to use the protective equipment provided. To ensure that personal protective equipment is always readily available, all defective equipment will be

promptly replaced. Regular safety tests as recommended by manufacturers will be conducted on equipment such as cranes and winches.

In addition, during operational phase risks such as fires are possible which requires safety equipment and fire safety plan in place, as well as training the building users on fire safety plan.

9.11 Waste disposal

It is estimated that the volume of waste produced during construction stage of this project will be minimal. The general construction wastes that may be generated from this project include packaging waste and, electric cables and associated parts.

Waste has to be transported to government designated waste management site. The clean-up of accidental spills of oil, fuel and paints whenever they occur will be monitored to ensure that the clean-up is promptly and properly done.

Decommissioning of solar panels is expected to have the highest impact on the environment. At the moment, these panels are classified as Special Waste in the waste regulation, which requires specially registered handling facilities. Given the presence of harmful substances in the panels, it can also be classified as a Hazardous Waste, which requires special facilities as well. At present there are no facilities in Maldives to handle large quantities of such waste. Therefore, temporary measures to contain the material and storage until proper facility is built need to be put in place.

9.12 Indicative Mitigation Measures

This section provides indicative mitigation actions to be taken on the part of the contractor(s) in order to minimize such impacts. In the construction activities as well other actions, the contractor will be required to abide by the provisions of the World Bank and the Maldives EIA regulations, including considering constructive input from stakeholders.

The impacts mitigation is discussed for the following three phases of the project implementation: For the ASPIRE sub-projects, these mitigation measures should be combined with the previous mitigation measures, as applicable.

- Pre-construction phase;
- Construction phase; and
- Operation and Maintenance phase.

The table below summarises the mitigation measures for potential key impacts identified above.

Table 4: Impact mitigation measures.

Impact	**Pre-Construction Stage**	**Construction Phase Indicative Mitigation Measures**	**Operation and Maintenance Phase Indicative Mitigation Measures**
Air Emissions	Identify suppliers that have products, which comply with ISO or other industry best practice standards.	-	-
Noise Emissions	-	Undertake installation activities only during daytime. Inform neighbours about work schedule.	Undertake maintenance activities only during daytime.
Chemicals	Identify suppliers that have products, particularly solar panels and inverters, which comply with ISO or other industry best practice standards.	-	For decommissioning, see waste management below. If the roof is used for rainwater harvesting, the panels must be checked more frequently for damage to the panels.
Heat or light reflection	Avoid sites that have roof slopes that would require to the panels to be placed in a manner which would reflect light into an immediate neighbour's window, balcony or door for more than 30 days a year.	Install screens to prevent light from reaching an immediate neighbour's window, balcony or door.	Same as construction stage, if a new building is constructed next to the site.
Biodiversity	Avoid sites that require cutting or substantially pruning a protected tree, an old tree or known bird-nesting tree.	If a tree needs to be pruned, only remove parts that are absolutely necessary. Do not remove a mature tree unless absolutely necessary	Same as construction stage

Impact	**Pre-Construction Stage**	**Construction Phase Indicative Mitigation Measures**	**Operation and Maintenance Phase Indicative Mitigation Measures**
Cultural Heritage	Avoid selecting culturally or religiously sensitive sites for the project	-	-
Employment	Train local workers, wherever possible.	Wherever possible, use local labour for installation, particularly in outer islands.	Same as construction stage.
Economic Impact and Livelihoods	Ensure wide dissemination of information to all stakeholders	-	Ensure project performance information project results are widely shared
Social conflicts	Ensure fair competition by creation of a level playing field. Ensure access to information and transparency in decisions. Undertake public consultation and information dissemination Establish and create awareness on grievance redress procedure	Create awareness on grievance redress procedure	Same as construction stage.
Health and Safety	-	All safety measures required for a high-rise installation must be followed. If working on a roof directly sloping to the road, a safety net must be placed on the side facing	Same as construction stage.

Impact	Pre-Construction Stage	Construction Phase Indicative Mitigation Measures	Operation and Maintenance Phase Indicative Mitigation Measures
		the road to prevent debris from accidentally falling on the road and appropriate warning signs must be placed on the road. All necessary protective gear must be worn at all times.	
Waste Disposal	Identify suppliers that have products, particularly solar panels and inverters, which comply with ISO or other industry best practice standards.	Dispose packaging and construction waste properly at approved waste management sites using registered transport facilities. This waste shall not be treated as domestic waste.	Have a temporary storage facility that can contain the waste until disposed. Enter into contract with an overseas recycling facility or waste disposal facility capable of handling solar panel wastes.

Any additional impacts, if any, and relevant to the project's implementation would be reviewed by EPA based on detailed assessments that will be undertaken as part of the implementation process. As indicated earlier, the environmental laws of the Maldives and the Safeguard Policies of the World Bank require that all projects be screened for potentially adverse environmental and social impacts. Consistent with these guidelines, an ESMF for the ASPIRE has been prepared to minimize adverse, including any cumulative impacts.

10 ENVIRONMENT MANAGEMENT PLAN

As explained in Section 6, an EMP must be prepared for all projects that are deemed to require an Environment Assessment following the screening process. The smaller projects may require an EMP only and the larger project will require an EMP embedded in the EIA. This section provides guidance to prepare an EMP.

The site specific EMP will reflect the Maldives Government Regulations and the WB's Performance Standards as well as measures to mitigate construction and post construction period's environmental impacts. The contractor must prepare the EMP and submit to the EPA, along with technical design and construction details.

The EMP includes following components;

***Issues**:* The EMP presents detailed description of the project impacts and mitigation measures. It includes environmental and social issues, and its significance for consideration under the subproject. An issue's significance should be based on supporting information and their explanation. The issues that are covered under an EMP may vary from subproject to subproject. These may include: waste disposal, noise control, protection of water sources, tree cutting, disturbance to wildlife, social services relocation/maintenance, for example, water supply lines, telephone, electricity lines, employment etc.

Mitigation: The EMP must identify site-specific, cost effective and detailed measures for each impact that will reduce the identified adverse impact to acceptable levels. The plan should include compensatory measures (such as tree plantation) if mitigation measures are not feasible, cost effective, or sufficient.

Alternatives: The EMP can also recommend any alternative measures for avoiding impacts;

Capacity Development and Training: If necessary, the EMP can recommend specific, targeted training for project staff, contractors, and community groups to ensure the implementation of environmental recommendation.

Implementation Schedule and Cost Estimates: For all mitigation and capacity development, the EMP must provide (a) an implementation schedule for measures that must be carried as a part of the project, and (b) cost estimates for implementing the EMP.

Integration: The EMP must be integrated into the project's plan and design, budget, specifications, cost estimated, bid documents, contract/agreement clauses. The EPA will instruct the ASPIRES's contractor(s) for proper implementation. Contract documents will only be

finalized when site-specific EMP recommendations are adequately and appropriately incorporated in the plan and design, cost estimates, specification, and the contract clauses.

Timing: Site-specific EMP shall be prepared at initial stage of the activities/detailed design. The PMU, with help from EPA, will certify that EMP recommendations are incorporated in contract documents. PMU will consult the EPA, in case of complexity in EMP. Past experience has shown that it is being prepared after a project's detailed design, allowing limited time for incorporating the environmental costs, and implementation mechanism and procedures.

A format for EMP preparation is presented in Appendix E. The format for an EMP within the EIA is presented in Appendix D.

10.1 Contractors Compliance for Environmental and Social Safeguard Measures

The contractors are also principle stakeholders in the project whose roles and responsibilities are to identify and mitigate the adverse impacts right from the beginning. Therefore, contract document needs to clarify the following roles / responsibility of contractors:

a) Use materials of high standard quality.

b) Maintain health and safety at work sites;

c) Do not allow haphazard disposal of waste, particularly on a beach or any other environmentally sensitive area;

d) Enforce use of recommended waste disposal sites that are approved by local authorities, as per the National Waste Regulation;

e) Provide health and safety gears, personnel protective equipment (PPE) to the workers/labourers;

f) Hire as many local labourers as possible;

g) Avoid damage / disturbance to historical / cultural / archaeological sites / natural habitats.

10.2 Proponent/Developer/Contractor's obligation and legal requirements

Prior to the commencement of construction works, all contractors should be required to prepare EMPs for the project as specified in this ESMF. The plan should be included in the bidding documents and in the contractor's contract. It should spell out environmental targets and objectives and how these would be achieved.

The Contractor's EMP shall include, to the extent practicable, all steps to be taken by the Contractor to protect the environment in accordance with the current provisions of national

environmental regulations, and the World Bank's environmental and social safeguards, as applicable to the ASPIRE.

Notwithstanding the Contractor's obligation spelt out above, the contractor shall, in addition, endeavour to implement all measures necessary to restore the project sites to acceptable standards and abide by environmental performance indicators specified in the EMP to measure progress towards achieving objectives during execution or upon completion of any works. These measures shall include, but not limited to the following:

a) Ensuring that noise levels emanating from machinery and noisy construction activities are kept at a minimum for the safety, health and protection of workers within the vicinity of high noise levels and neighbouring properties.

b) Preventing any oils, lubricants and wastewater used/produced during the execution of works from entering groundwater.

c) Preventing and minimizing the impacts on the biophysical environment including any protected areas, local communities and their settlements.

d) Discouraging construction workers from engaging in the exploitation of natural resources such as fishing, and collection of any marine biodiversity products or any other activity that might have a negative impact on the environment.

e) Ensuring that adequate food and drinking water are provided to the construction workers and appropriate facilities for garbage disposal and sanitation is provided.

f) Ensuring public safety and meeting traffic safety requirements for construction work in proximity to the road in order to avoid accidents.

g) Discouraging the use of *foul or infuriating words* on project-affected persons (PAPs) and communities. All such persons and communities and their grievances should be politely referred to the appropriate authorities for redress.

11 MONITORING AND CAPACITY BUILDING RECOMMENDATIONS

A monitoring program is needed to ensure that no unforeseen impacts are occurring from the proposed roof top solar PV projects of the ASPIRE program and that any mitigation strategies that have been developed and implemented are functioning and operating as intended. The following mechanisms are proposed to ensure successful monitoring and evaluation of environmental and social impacts.

11.1 Indicators for monitoring

To conduct monitoring, the EPA will identify a detailed set of monitoring indictors and reporting guidelines. The following indicators are relevant to the scope of the ESMF and are necessary for inclusion.

Table 5: Indicators for environmental and social monitoring.

Impact	Indicator	Source of Information	Responsibility
Air Emissions	- Reduction in greenhouse gas emissions caused by the project - Cumulative reduction in greenhouse gas emissions by ASPIRE	STELCO PMU	EPA MEA
Noise Emissions	- Noise intensity and duration in installation of solar panels	Contractor, third party monitoring	EPA
Heat or light reflection	- Number of complaints on heat or light reflection	Contractor, Male' City Council, MEE	MEA, EPA
Biodiversity (flora)	- Number of trees felled	Contractor, Male' City Council, MEE	EPA
Biodiversity (fauna)	- Reported number of incidents of injury or killing of birds	Contractor, Male' City Council, MEE	EPA
Chemicals	- Details of the number of solar panels by manufacturer and	Contractor	EPA

Impact	Indicator	Source of Information	Responsibility
	supplier		
Cultural Heritage	- Reported complaints on reduction of aesthetic value or impact on heritage	Contractor, MYS	EPA
Employment	- Number of technical and unskilled workers hired and contract duration - Local to Foreign worker ratio	Contractor	EPA
Economic and livelihood impacts	- Individual project cost saving to utility company - Price of solar panels purchased per kw - Cumulative cost saving to the nation - Changes in household incomes in the project location - Proportion of household expenditure on electricity - Changes in electricity subsidy and fuel subsidy paid to households	STELCO PMU MEE DNP DNP DNP	MEA MEA MEA MEA MEA MEA
Social conflicts	- Number of stakeholders consulted and minutes of the meetings. - Number of contractors to whom	PMU PMU	MEA

Impact	Indicator	Source of Information	Responsibility
	information is given - Number of contractors who submit EOI by country of registration - Number of complaints received on inconvenience and maintenance	PMU Contractor	
Health and Safety	- Reports of occupational health injuries and accidents	Contractor	EPA
Waste Management	- Quantity of day to day waste produced and taken to waste management site - Quantity of solar panel special waste taken to designated waste site - Quantity of solar panel special waste exported	Contractor Contractor	EPA

11.2 Monitoring and Reporting Responsibilities

The EPA will be the lead agency for monitoring, reporting and evaluation on environmental and social impacts of ASPIRE program. EPA will also carry out supervision to monitor progress of sub-projects. The main aim of supervision is to observe the issues at sub-project level and to support the implementation teams. While most of the monitoring oversight will be conducted by the EPA, if necessary it can use the services of competent third party monitors to provide periodic and objective assessments of progress, shortfalls and challenges in the implementation of specific project components/sub-components. It may also seek assistance of the WB for advice and guidance.

The project proponent/developer(s) will be responsible for regular monitoring and reporting of progress and achievements of the ASPIRE at sub-projects level. The EPA, from time to time, will conduct an oversight of the sub-project results submitted by contractors and evaluate how the process was implemented.

The monitoring and reporting of the ESMF at the different stages *will include:*

A: Pre-construction to ensure that: (i) proposed construction activities, as applicable at each site(s), are subjected to environmental screening; plan and design for construction activities *confirms to the Environmental Guidelines of the WB and/or the Government of the Maldives for Planning and Design;* and (ii) site specific Environmental Assessment (EMP or EIA) is prepared in time and incorporated into bidding documents for submission to the EPA for review and approval;

B. During construction: The EPA, on an ongoing basis, will conduct compliance monitoring, using the specific environmental measures relevant to, and prescribed for the activities as well as to assess general environmental management/performance. Supervision, as well as progress report(s), should contain information with regard to environmental compliance as well as any difficulty or outstanding works need to be prepared. The findings should be discussed with the PMU. The EPA will establish monitoring mechanism for operational stage monitoring. In addition, the Government of Maldives may consider an annual independent monitoring on environmental management and performance. The EPA and the PMU will record these findings.

C. Mid-Term and End-term Reviews: The EPA and PMU may conduct this, roughly during the middle of the programme period, and an end-term review close to the time when the programme ends. Important elements of these reviews will assess the programme's progress.

D: During post-construction: The EPA and the WB may agree to jointly prepare a post-construction, post ASPIRE completion report for their records. In addition, joint reviews by the Government and the World Bank each year when the project is under implementation may also be conducted. The objective is to ensure the collection of reasonably complete and credible data from all participating project institutions on the key performance indicators and others.

11.3 Evaluation

The objective of evaluation is to judge the impact of implementation effectiveness. It will be done through independent consultants having experience in similar tasks. This will be undertaken during midterm and end of the project. The evaluation will assess ESMF's effectiveness in addressing environmental and social impacts of the project. The midterm evaluation will give feedback for implementation of the ESMF.

11.4 Capacity Building

Past experiences of similar projects suggest that the capacity of the government to deal with environmental issues is generally weak at all levels. The MEE, therefore, will strengthen environmental training during the ASPIRE implementation through the following suggested measures:

- Providing renewable energy related training and awareness sessions to environmental policy makers
- Providing Environmental Assessment and Monitoring training specific to energy projects to EPA staff
- Preparing manuals and guidelines on how to assess the environmental impacts of RE projects.
- Recruit an Environment and Safety Officer, who will be responsible for the following:
    - Liaison point for all developers/contractors to assist in following the procedures set out in this ESMF, particularly the screening and approval processes.
    - Monitor the compliance of social and environment aspects related to sub-projects
    - First point of contact for Grievance Redress Mechanism
- Environment and Safety Officer must have a background in environmental management and be provided training specific to energy projects.

11.5 ESMF Implementation Budget

This ESMF will be implemented and funded for most part by the developers. The submissions, preparation of EAs and funding the mitigation measures will be their responsibility and should be included as part of the overall project cost.

The MEE will mainly be responsible for financing the Environment and Safety Officer post and monitoring activities. These are expected to be financed as part of the programme administrative costs.

12 GRIEVANCE MECHANISM

A procedure for grievance mechanism was discussed with key government officials and some of the potential stakeholders. The initial grievance mechanism is summarised in the Table 6 below.

Table 6: Elements of proposed grievance mechanism.

Tiers of Grievance Mechanism	Nodal Person for Contact	Contacts, Communication and Other Facilitation by Project	Timeframe to address grievance
First Tier: City Council / Island Council	City or Island Council will be the first point of contact. Designated contact persons should be established within the Council. Complaints received by Police will also be shared with the contact person(s) at the Council.	• In the Island/City Council Office there will be an Information Board listing the names and contact telephones/emails. • Grievances can be registered informally by contacting the City/Island Council (directed to the contact person(s)). • If the grievance cannot be resolved informally, an aggrieved party must submit a complaint on a letter addressed to the Mayor on the Tier I Complaint Form to take the grievance further. For those who cannot properly write, the Council staff will fill a Complaint Form and get it signed by the aggrieved party. The form must be available online on the MEE website and from the Island /City Council office. A copy of the form must be provided as a receipt to the aggrieved person at the time of submission. The form will be prepared, produced and supplied to the Council by MEE. • The Council must screen the grievance to determine if the issues and concerns raised in the complaint falls within the mandate of the ASPIRE program. • The list of grievances classified as ASPIRE programme related must be maintained on a register	7 working days

Tiers of Grievance Mechanism	Nodal Person for Contact	Contacts, Communication and Other Facilitation by Project	Timeframe to address grievance
		at the City/Island Council. Informally communicated grievances must also be listed on the register and must be maintained by the designated contact person(s) at the council. • The council will determine the solutions to the issues either by (i) discussing internally; (ii) joint problem solving with the aggrieved parties or; (iii) a combination of both options. • If the complaint is resolved within 7 working days the Council must communicate the decision to the aggrieved party informally or in writing, depending on how the complaint was lodged. • The aggrieved party must acknowledge the receipt of decision and submit their agreement or disagreement with the decision within 10 days. • If no acknowledgement is submitted from the aggrieved party then the decision will be considered as accepted.	
Second Tier: Ministry of Environment and Energy – Maldives Energy Authority	For ASPIRE Projects, MEE will forward the grievance to the Project Management Unit (PMU) of the Ministry.	• If unresolved, the aggrieved party can elevate the grievance to Tier 2 and submit a complaint on a letter addressed to MEE or on the Tier II Complaint Form. Submission must contain a copy of Tier I submission form or letter and if available, the decision statement from Council from Tier I. • MEE will forward the matter to PMU. • PMU will screen the grievance	15 Working Days

Tiers of Grievance Mechanism	Nodal Person for Contact	Contacts, Communication and Other Facilitation by Project	Timeframe to address grievance
		to determine if it is related to the ASPIRE projects. If it is unrelated, the aggrieved party must be notified in writing and the way forwarded must be outlined to them including the necessary government institutions to follow up, like the Police. • A contact person in PMU must be identified for processing a grievance through the Second Tier. • If required, the MEE must arrange a public meeting to address the tier 2 grievance and notify the nature of the grievance and the meeting venue to the aggrieved party. • MEE may also visit the site and hold onsite discussions and meetings. • The PMU will be responsible to ensure that there is no cost imposed on the aggrieved person, due to the grievance mechanism at the second tier. • If the complaint is resolved within 15 working days the PMU must communicate the decision to the aggrieved party in writing. • The aggrieved party must acknowledge the receipt of decision and submit their agreement or disagreement with the decision within 10 days. • If no acknowledgement is submitted from the aggrieved party then the decision will be considered as accepted. • If the grievance is not resolved	

Tiers of Grievance Mechanism	Nodal Person for Contact	Contacts, Communication and Other Facilitation by Project	Timeframe to address grievance
		to the satisfaction of the aggrieved party within 15 working days of submission of the grievance to tier 2 then the aggrieved party may notify the MEE, in writing, of the intention to move to tier 3.	
Third Tier: Judiciary Power / Assistance to Vulnerable Persons beyond the Project's Grievance Redress Mechanism	An individual has the option of going to established judiciary system of the country	• The legal system is accessible to all aggrieved persons. • Assistance from the ASPIRE project is available only for vulnerable person(s) as per this grievance mechanism. • In cases where vulnerable person(s) are unable to access the legal system, the Attorney General´s office will provide legal support to the vulnerable person(s). The PMU must assist the vulnerable person(s) in getting this support from Attorney General´s Office. PMU must also ensure that there is no cost imposed on the aggrieved person if the person belongs to the vulnerable groups. The list of vulnerable groups is as defined in the footnote but may be further defined by MEE. • The verdict of the Courts will be final.	As per established judicial procedures in Maldives

NOTE: A vulnerable person/group is defined for ASPIRE Project as "*A person who is poor, physically or mentally disabled/handicapped, destitute, disadvantaged for ethnic or social reasons, an orphan, a widow, a person above sixty years of age, or a woman heading a household*".

The grievances emanating from the programme may be varied. Some potential situations are summarised below:

a. Complaints against the contractors
    i. from the property where the Solar PV units are installed
    ii. from neighbouring properties
    iii. from road users
b. Complaints against the STELCO
c. Complaints against the presence of solar PV units
    i. from the project building tenants or users
    ii. from neighbouring properties
    iii. from members of public or groups if the units are placed in historical, religious or cultural sites.
d. Complaints against equity issues related to the use of roofs and the visible benefits to the buildings or property.
e. Complaints from the developer against damage to the panels from the neighbours or the building users.

The proposed Grievance Mechanism above must be reviewed during EIA or EMP preparation and, if required, adjusted to suit the specific needs of the stakeholders, particularly building users and neighbours.

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APPENDIX A – STAKEHOLDER CONSULTATION NOTES

Meeting with Environment Protection Agency (EPA) & Maldives Energy Authority (MEA)

Location: Environment Protection Agency

Participants:

1. Mr. Mohamed Rameez – Coastal Zone Management Section
2. Ms. Siyama Saleem – Biodiversity Section
3. Mr. Akram Waheed – Maldives Energy Authority
4. Ms. Shazma Naseer – Maldives Energy Authority
5. Ms. Mariyam Rifga – Biodiversity Section
6. Ms. Aminath Haifa - Biodiversity Section
7. Mr. Riffath Naeem – Social Safe Guards Officer.

Date and Time: 10/03/2014, 13:00 pm

Discussion Points:

The consultant presented the project and a summary of the proposed ESMF to the participants. The following are a summary of the main discussion points.

It was generally agreed that the proposed scope of work mainly requires an Environment Management Plan. However, given the clauses in the EIA Regulation, provisions must be given to all the processes involved, including the use of EPA specified screening forms and possibility of an EIA. EPA may only require one screening activity for the ASPIRE programme to determine if the project involves EMPs or EIAs.

Questions were raised regarding the proponent for the project. It was agreed that the investor/developer will be the proponent and not the building owner, STELCO or the MEE. Each proponent can lump multiple roof in a single geographic area together and propose as a single project.

Although the EIA Regulations does not specify a Decision Note for an EMP, EPA has issued an internal directive to provide a Decision Note to EMPs as well. The EMPs may be prepared by the proponent himself but it should be checked and signed by a registered consultant.

EPA raised concerns about the potential expansion of scope. For example, STELCO requiring excavation and laying new cables to meet the new demands. It was agreed that this would constitute a separate project by STELCO to upgrade the power infrastructure and is beyond the requirement for the ASPIRE project proponents.

Standards for Solar PV installations

MEA does not have specific technical standards for sourcing, installing and maintaining solar PV units. This may pose a challenge to the ASPIRE programme and EPA as well. There is no reference guideline for EPA to determine compliance required for installations, in terms of safety and potential nuisances for the host property and neighbouring properties. For example, the angle of installation, distance to a balcony, fastening mechanisms, standard of the solar PV panel etc.

It was agreed for MEA to consider developing a guideline for approving solar PV projects, which EPA could use as reference in ensuring minimal safety and social impacts.

MEA also requires the proposed roofs/site to be registered. A licensed engineer is required to attest that all electrical workings are up to the required standards. This may also be an avenue to ensure minimal impacts on environment, such as the need to cut-down important trees.

Other Issues

The provision in the ESMF to prevent cutting down or pruning of protected trees was supported. Also, provisions in the Screening Form to avoid sites with thick vegetation were agreed as being essential.

The cautions identified on the use of cultural, religious and historical sites were also welcomed.

Issues relating to the construction of new buildings next to existing project roofs were discussed. It was agreed that it is not possible to control the new construction or changes to land use and that this would be a risk to the project.

Meeting with STELCO

Date: 13 March 2014

Abdul Malik Thaufeeg – Engineer, 7775866, Projects Department

Ahmed Iqbal – Senior Engineer, 7778995, In charge of greater Male' region except Male'

Ahmed Saif – Engineer, 7778672, Projects Department

Ibrahim Nashid – Engineer, Transmission and Distribution, Male' Region

Azzam Ibrahim – Senior Engineer, 7782574, Business Development

During peak demand in Male', peak load is 43 kW. This is during noon in the daytime. Future electricity demand forecast in Male' shows that 70MW would be needed by 2020 if present growth rate continues.

It has only been 2 years since installation of solar photovoltaic in the Maldives. In the Male' area, solar panels have been installed in some selected schools, Youth Centre in Male', President's Office, Velaanaage Office Building, and STELCO building. The current installed solar photovoltaic capacity in Male' is 675kW. The solar panels belong to the Ministry of Environment and Energy and STELCO purchases from the Ministry.

All solar energy produced by REM is currently purchased by STELCO. The agreement is for 20 years. STELCO purchases from the producer at a pre-agreed rate.

The present solar photovoltaic installations do not have battery backup. Battery backup would increase the usefulness and efficiency of the solar panels. However, batteries are still very costly. It is estimated that USD 4.5 million is needed for 1 MW of battery, which would run for 7 hours continuously. At least 5 MW battery is needed in Male' for increasing efficiency and to cut down fuel costs. Rakeedhoo Island is going 100% on renewable energy using solar photovoltaic with the use of battery under ADB loan assistance program.

For maintenance, no major washing of solar panels is required. Washing was undertaken once for solar panels installed in the Villingili powerhouse.

So far, no complaints have been received from the public on the solar panels installed in Male' region. There have been no complaints received on reflection or any other issues.

STELCO identified several challenges for RE by photovoltaic in Male' region. These include:

a. There aren't many buildings with large roof space available in Male'
b. There are no guidelines for using a private residential/hotel roof.
c. The roof quality of the existing building needs to be assessed. Full roofing might need to be changed to ensure longevity for the lifetime of solar panel installation.
d. Buildings are continuously being demolished and newly constructed. Hence building roof availability and duration needs to be guaranteed.
e. Shadow over cast is an issue and has to be assessed for the selected buildings based on future developments around the area.
f. Energy security issues need to be resolved by formulating strong regulations on guaranteed power selling, if private investors are involved.
g. Grid stability is an issue if there are multiple private investors. Proper monitoring should be undertaken and STELCO should be informed in advance on how much each investor will be produced and sold.
h. If different investors can come at different points and work is pending without progress, the investors next in line may face disadvantages.

STELCO believes that for true results, the generators at STELCO need to be sized properly. Replacements are needed. The desired fuel saving results will be seen when STELCO is able to switch off at least one generator and run a minimum of 1MW fully on solar energy.

STELCO also identified that the existing legal framework is weak. Existing regulation is for feeding tariff system. The regulations are not very clear on distinction between domestic use, business use and net metering.

STELCO is interested in investing in solar energy production. They have the administrative structure, fully functional office as well as technical expertise. However, it becomes difficult for them, as they are a 100% government owned company under the authority of Ministry of Finance and Treasury. Hence they face difficulties in securing finance for RE projects and in decision making.

Meeting with Renewable Energy Maldives Pvt Ltd

Location: Renewable Energy Maldives Pvt Ltd

Participants:

1. Ms Hudha Ahmed - Director
2. Mr. Abdul Rahman Ali – Managing Director

Date and Time: 10/03/2014, 13:00 pm

Discussion Points:

The consultant presented the project and a summary of the proposed ESMF to the participants. The following are a summary of the main discussion points.

Legal Aspects

One of the biggest challenges facing RE projects in Maldives is the lack of a legal framework to undertake large scale projects. The most important are the issues related to roof ownership. At present, it is possible to enter into individual roof lease agreements but there is no legal guarantee that these agreements can be maintained in the long term. Added to this is the large number of roof lease agreements that may be involved in each of these projects. Without the proper legal framework, managing all these agreements will be a big challenge. One option is to avoid numerous small agreements is to have bulk roof agreements.

There are also occasions where the building owner and the current user has differing views on the installation of solar panels. For example, the Ministry of Education may lease a school roof but the success of the project depends on the how the current school management provides support for the activity.

STELCOs ability and Willingness to Purchase

There needs to a clear policy and agreement from STELCO to purchase power from Solar PV. There is also need for standard Purchase Agreement to be signed with STELCO.

There are cases where technical and administrative issues identified by STELCO have prevented the off-take. For example, in Billabong High School, technical issues prevent STELCO from purchasing the electricity produced from the numerous panels installed on the school. Perhaps, since the ASPIRE is an MEE project, these issues may be more easily resolved.

Local company preference

RE Maldives had strong reservations on how the current bidding processes are run. They would like to see more preference given to local companies in these projects. At present, they are

unable to compete with big multinational companies. Doing so would assist innovation and employment in the field and make these programmes more sustainable.

They also had reservations about the potential impacts from the ASPIRE programme on the local Re industry. If the ASPIRE programme involves purchasing all available STELCOs power requirements for RE, and if the big multinational companies take over the programme, the local industry will be badly affected. They would classify the loss as "loss of livelihood". Specifically, this programme may prevent the use of net metering.

Grievance Mechanism

The grievance mechanism should involve the World Bank. There will be a number of issues including potential corruption in selection of developers, disputes with STELCO, guarantees from World Bank and roof lease agreements. World Bank involvement is required in evaluation of the bids and to ensure transparency in the process.

Other Issues

There are also social issues associated with RE activities. So far, RE Maldives has noted the dissatisfaction with limited direct benefits to the roof lessor. If there is no energy saving to the lessor, they have often complained about it. This may become a major issue in the future.

Cutting down trees is a major challenge. Issue may crop up later as well with overgrowth of trees. Maintenance activities are often difficult and expensive.

Panel damage is a concern. The roof lessor will not be responsible and quite often the source or offenders are unknown. Panel's being stolen is also a concern. Public building roof access has been a concern in the past. The panels are accessible to too many people and controlling access is also not always practical in public buildings.

RE Maldives do not see mosques having cultural issues with panel installation, as they have had special requests in the past to undertake installations in mosques.

There is a fear that the scale of this programme will affect small scale projects as STELCO might be reluctant to buy electricity from smaller projects. There is also a fear that the proposed feed method may become dominant and close-off other options such as net-metering. ASPIRE programme should not exhaust the total buying capacity of STELCO.

Meeting with Aminiya School

Date: 16 March 2014

Mohamed Naseem - Administrator – 7749695

Aminiya School said they are not aware of any proposed solar photovoltaic installation on the school roof. The administrator informed that he would be aware if any projects have been discussed.

- Aminiya School is the first ever girls school in the Maldives and has historical significance.
- There are 5 main blocks within the school. They are *block F, block V, block J, block W and block S*
- *Block V* and *block J* are in the process of demolition for construction of a new 8-storeyed admin and academic building. 80% of the buildings in these 2 blocks have been demolished.
- *Block S* and *block W* are also planned to be demolished in the future for construction of a new building, possibly after the completion of the blocks V and J.
- In 2012, the roof ceiling of *block W* crashed on the floor forming a hole. A full inspection of the school buildings was conducted. However inspections concluded that the ceiling could be patched up and managed for sometime. Block V was at a greater risk of falling apart. Hence it was decided to demolish block V first.

No information on ASPIRE project has been communicated with the school. Sometime last year, two people (don't know the names or their organization) came to assess the school buildings. Informal communications with the people who came for assessing the roofs of the school informed Aminiya that:

- *Block S* gets sunlight only from around 11am to 3pm. Shade from huge trees in the Sultan Park fall on the roof of block S.
- *Block F* is the most suitable for solar installation. It is a four-storied building adjacent to CHSE. Block F receives sunlight throughout the day. It is newest building in the school.

There are no protected trees in the school. 2 trees in *block V* are planned to be cut down for the construction of the 8 storey new admin and academic block.

The mango tree in the school is a very historical tree and they do not intend to cut it down during the construction of any building in the school. They hope to keep the mango tree intact.

Meeting with Hulhumale' Development Corporation (HDC)

Date: 13 March 2014

Hussain Ziyath – Planning Department

Ahmed Sofwan – Municipal Department

Khadheeja Mohamed – Municipal Department

HDC is aware of ASPIRE project. Mr. Akram from Environment Ministry has met with them in the past and briefed about the project. HDC supports renewable energy initiatives. At present, there are no renewable energy initiatives on going in Hulhumale'.

In the past, HDC had experimented street lighting with solar panels. But the project was not successful. The solar panels used for the project are stored to be made available for future use.

HDC has had meetings with several groups trying to install solar panels. International groups and private groups meet them for advice and consultations. HDC is concerned that there is no formal government policy on private installation of roof top photovoltaic. Furthermore, HDC is not aware of the liaison and co-ordination mechanisms with Environment Ministry.

The roof of residential flats and apartments in Hulhumale' are the property of the landlord/owner of the top floor of the flat/apartment. Hence HDC cannot allocate those roofs for solar panel installation. HDC has provided Environment Ministry with a list of roofs that can be utilised. The mosque was excluded from the list considering the dome has a round shape.

HDC does not support cutting down any trees for any solar panel installation project. There will be no issue of trees that need to be cut down in the buildings that were allocated for solar panel installation. The hours of sunlight and building shadows and other technical aspects would need further study by the contractors.

Presently there are no regulations mandating individual developers and private property developers to use solar panels in construction of the buildings. HDC is planning to introduce guidelines for supporting energy efficient technologies (eg: water heating, electricity production) in the new buildings.

For grievance HDC has a Municipal Department where the public complaints/issues are received. It is functioning well for the residents. Hence first tier of complaints from Hulhumale' residents should be to the Municipal Department in HDC. The second and third tier can remain the same.

Meeting with Billabong High International School, Male'
Date: 11 March 2014

Ibrahim Shaeeq, Vice Principal, Secondary - 775 0147

The school encourages all green initiatives. In 2013, the physics department of the school initiated a solar power project to reduce the carbon footprint of the school. Currently there are 301 solar panels installed on the school roof with an installed capacity of 70kW. The solar panels were connected to the Male' grid on 22nd January 2013. It is estimated that the school solar panels reduce 01 Tonne of CO2 emission in every 6 days.

The solar panels were installed with the assistance of the School Board and technical support of Renewable Energy Maldives (REM). The Vice Principal of the school was not aware of the understanding between REM and the School Board on the project. The Vice Principal was not aware of how the project was financed.

At present the school and students can see the amount of energy produced by the solar panels from the display board outside the school. "The current rules and regulations regarding renewable energy" is discouraging, because the school cannot use the energy produced by the solar panels. Hence the students cannot feel the true impact of what they have done.

If the school can convert a floor of the school or a classroom for instance, to use only the energy produced by the solar panels, then everyone can feel and comprehend the impact of renewable energy in real life.

At present the solar energy produced is fed into STELCO's gird. The school Vice Principal was not aware of what happens after that. He assumed that there might be an understanding with the school board and STELCO to offer a discounted rate for the amount of energy produced. Neither the school nor the students feel that they are using solar energy. It is very demotivating and frustrating for the students and the physics department.

The Vice Principal believes that if an arrangement where the students can "feel" that they are actually converting sunlight into energy using the solar panels on the roof, then the students would show a keen interested in renewable energy and would be more involved in studying, maintaining and looking after the panels. The Vice Principal said that there are many solar panels installed on many rooftops in Male'. However there is no way for people to feel the impact of that. It would be a very striking factor to know and say that even '*one laari'* has been saved from the electricity bill due to solar panels.

Meeting with Culture and Heritage Section, Ministry of Youth and Sports

Date: 9 March 2013

Zaha Ahmed – Head of Heritage Section - Assistant Architect – 3340210

Asiyath Mohamed - Project Officer

Afsal Abdulla - Administrative Officer

Protection and preservation of culture and heritage is presently the mandate of Ministry of Youth and Sports. There are 30 staff in the Section. Their staff are divided among: the National Museum; Heritage; Utheemu Palace; and Administration.

Information on ASPIRE program has been communicated with Ismail Nasru – Assistant Research Officer from the Section. He is on leave at the moment.

The selected buildings and sites for the solar PV installation will have to be communicated with the Culture and Heritage Section located in the National Museum building. Thereafter they shall evaluate the building or site to check if it falls under any heritage criteria.

The Culture and Heritage Section have a list of List of Archeological and Heritage sites. But the list keeps on changing. They do not have exact information of all the heritage sites in the Maldives as they are under staffed to do proper monitoring in the islands.

There are 9 criteria used to classify sites as heritage site. There is no proper legal framework for the protection and preservation of culture and heritage in the Maldives. An old law from 1960s exist prohibiting destroying of heritage sites. However, a new bill has been drafted and sent to AG Office for review.

At present, Culture and Heritage Section is working on an application for UNESCO World Heritage List status for the mosques built on limestone *(Hirigalu Mosque).* There are 21 mosques on the proposed list. The mosques of outstanding value will be selected after filtering out the rest.

Meeting with Youth Centre/ Social Centre Male'

Amy, Senior Administrative Officer, 7932011

Youth Centre has no information about the capacity and quantity of solar panels that were installed in Youth Centre. The Youth Centre has no role in maintaining solar panels that have been installed on the roof of Youth Centre. The installation, servicing and maintenance are all done by STELCO.

Youth Center requested to contact STELCO for information.

Meeting with SWIMSOL

Shifna Saeed, 7902866

SWIMSOL Maldives is established with an Austrian partner company. There is one technical local staff.

SWIMSOL is planning for a solar panel installation project in Landaa Giraavaru tourist resort lagoon. Solar panels will be installed in the lagoon and will be the first project of this kind in the Maldives. The technical feasibility experiments are on going in lakes in Austria.

The key challenge faced by SWIMSOL is the weak legal framework. The regulations and guidelines for renewable energy development in the Maldives are not clear. The limited roof space available in the Male' region is also a disadvantage. Rented apartments with separate meter readings is also a limiting factor.

SWIMSOL recommends making all regulations and standards easily available and accessible from one location.

Mookai Hotel

Hood Ibrahim

Mookai hotel does not have any solar panels installed for providing electricity. Mookai water heating is by solar power. They are very interested in renewable energy initiatives. In the past they have done an energy audit of the hotel to assess feasibility of solar panel installation.

Male' Public Consultation

Date: 17 March 2014

Participants: Ahmed Nasih, Shuaib Mohamed, Umair Ali, Haisham, Aminath Insha, Sharif Mohamed, Ali Siraj, Mohamed Ahsan, Ibrahim Musthafa, Ibrahim, Mohamed Asif, Shahid Abdulla, Nahid Adam, Moomin, Abdulla Rifau, Mohamed Shafaau, Imdhaadh Zaki, Mariyam Niaf, Ali Shareef, Arif, Mohamed Ali, Bunyaameen, Mohamed Nabeel, Habeeb Mohamed, Aminath Areef

Most of the Male' residents who were consulted informed that they were aware of the roof top solar projects implemented in Male'. They referred to the roof top solar PV projects implemented in Hiriya School, Billabong School, Taajuddin School, Social Center, Mulee-aage the Presidential Residence, Stelco, Champa Residence, and Ooreedooo.

The Male' residents perceive that solar PV is a very good initiative that will save on the energy bill. The perception is that solar PV is a cheaper form of energy will save a lot of money spend on electricity at present. Everyone needs it and solar PV is environmentally friendly and safe. Some expressed that solar PV installation is a very good thing to do to become carbon neutral by 2020. Solar PV will reduce the emission of carbon dioxide and is a better option than burning fossil fuel. Public is of the view that solar PV is a very good green technology will not produce sound or smoke like the present diesel generators. Solar PV uses natural energy and the abundant sunlight in the Maldives make it ideal for the country. Some are of the view that it is a fancy, fashionable thing that will save the environment.

The challenges for roof top solar PV in Male' mentioned by the public include: no space in Male' for such a project, limited roof available, high initial capital costs, solar panels are expensive, high installation costs, large investment required, will not be affordable to many, some buildings may block sunlight, building designs are not compatible for solar PV, difficult to use at individual household level, solar panels take space, difficulty in maintenance and service, no mechanisms to dispose waste and batteries after expiration.

The solutions proposed to address challenges include: encouraging people living on top floor of buildings to invest in solar, strengthening of the economy to enable people to earn more and spend for RE, to audit the available roofing, revise housing designs for upcoming projects in Male', make more people aware of the long term value of investment, to explore public private partnership, government subsidies, long term repayment options, bring in foreign investments, support to local businesses, and installation of panels in the lagoons. Public is of the view that Government needs to play an important role to enable and should devise multiple options to support the public and to provide solar panels at a cheap price.

Hulhumale' Public Consultation

Date: 17 March 2014

Participants: Agleem, Shaheedha, Zahura, Shazra, Hamdhoon, Zahir, Ali Ihusan, Husham Ali, Mariyam Ali, Fayaz, Farhaad, Leesha, Mariyam Hassan, Irfan, Saidha, Hamdhaan, Azeeza Ibrahim, Aisha, Ibrahim Zahir, Sharafiyaa, Yaasmeen, Saadhaa Shareef, Ziyaadh, Mariyam, Dhimasha

All the members of the public who were consulted welcome roof top solar PV. The overwhelming reason for the public acceptance is their perception that roof top solar PV is good for the environment. They believe it will be a good solution to Hulhumale's electricity issues. Some members of the public believe that it will reduce electricity costs and lead to more energy saving.

Half of those consulted informed that they are not aware of any solar energy installations in Hulhumale'. Those who responded that they knew about solar energy projects in Hulhumale' mentioned that they are aware of solar street lights in Hulhumale' and the solar PV in HDC Building and the school.

Some members expressed concern that though solar PV is a good initiative it is not happening in the Maldives. The overwhelming view is there are no challenges to implement roof top solar PV projects in Hulhumale'. The challenges raised by the public include: Stelco might have issues since it will mean a drop in their revenue; solar PV is expensive; solar PV is not affordable; solar PV is difficult to install, not enough roof space for solar PV; people do not have access to credit to buy solar PV; and such projects will have implications on the national budget at a time when public sector debts are very high.

The proposed solutions for the issues include giving a major role to Stelco; making the public more aware; speeding up implementation; government establishing fund to help the households; and Government paying for the solar panels. The public also wants the Government to solve the issues related to the project quickly.

Villingili Public Consultation

Date: 16 March 2014

Participants: Mohamed Ahmed, Mohamed Hassan, Ibrahim Hussain Manik, Rimah Ahmed, Mariyam Zoona, Niuma Mohamed, Hassan Mohamed, Mariyam Manikfaan, Ahmed Raoof, Ahmed Dhain

There was a mixed response from residents of Villingilli about knowledge on existing roof top solar PV projects in Villingilli. Some expressed they had no idea while others identified the existing projects. The public identified that there are solar PV installed in Edhuru Vehi building, the School and the MNDF building.

Everyone consulted informed that they believed roof top solar PV project is a very good initiative. The main reason for the acceptance is that solar PV will lead to reduced electricity bills and will save the environment.

The main challenges identified include: solar panels are not available in shops in the Maldives to buy, solar panels need to be purchased from other countries, the heaviness of solar panels and high freight costs, no organized import of solar panels, lack of information on prices, no installation guidelines and lack of private companies in the RE sector.

The overwhelming view is that unity and community cohesion is essential for the success of such projects. There is a need to get the small and medium enterprises interested in RE projects and to set up a regulatory framework such that private companies can invest in providing services to households similar to the present cable and satellite TV services.

APPENDIX B – ENVIRONMENTAL AND SOCIAL CHECKLIST

Subproject Name:
Proponent:
Island/Ward: Reviewer:

		Yes	No
A: Type of Project – Will subproject or any site involved in the subproject			
1	Build or rehabilitate any structures or buildings?		
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		
3	Be located within or adjacent to any areas that are or may be protected by government (e.g. protected tree, heritage site, protected area)?		
4	Be located on a water harvesting roof?		
5	Be located in an area where plans for future land uses may affect the project?		
6	Produce solid wastes during construction, operation or decommissioning?		
If the answer to any of questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimise typical impacts or risks. If the answer to Question 2 or 3 is "yes" the process required for EIA must be followed.			
B: Environment – Will the subproject or any site involved in the subproject			
7	Risk causing contamination of drinking water?		
8	Need to cut down any trees?		
9	Be located within or adjacent to environmentally sensitive areas (e.g. mangroves, wetlands), threatened species or a protected tree?		
10	Require freshwater during operations?		
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		
12	Will there be any liquid discharge to ground water aquifer or the lagoon during construction or operations?		
13	Involve use, storage, transport, handling or production of substances or material that can be harmful to human health or raise concerns about the actual or perceived risks to human health?		
If the answer to any of questions 6-11 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimise typical impacts or risks. If the answer to Question 7, 8, 9, 11 or 13 is "yes" the process required for EIA must be followed.			

C: Social –			
14	Will the proposed roof required additional improvement works before installation of solar panels?		
15	Would this project create new and additional jobs?		
16	Are there health impacts during implementation stage?		
17	Will this project affect livelihood adversely? (If answer is yes and livelihoods will be affected adversely please attach details of how it will be impacted and the type, magnitude and severity of impact)		
18	If livelihoods will be impacted, are there adequate alternatives or compensations considered? (If yes, please provide details)		
19	Are there any disputes/complaints from the neighbouring properties?		
If the answer to any of questions 16, 17, or 18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimise typical impacts or risks.			

APPENDIX C – ENVIRONMENTAL CLEARANCE PROCESS

It is recommended that each proponents/investors go through the environmental clearance process for their subprojects. All the planned installations that fall under a sub-project can be lumped together as a single project.

The following process follows the EIA regulations issued by EPA in 2012.

Step	**Environmental Clearance Procedure for the major subprojects.**
1	The Proponent prepares a Development Project Screening form and Submit to EPA.
2	EPA will complete the process and inform the proponent either to: (i) undertake the preliminary Environmental assessment or (ii) to prepare an Environment Management Plan.
3	If a preliminary Environment Assessment is required, the Proponent will prepare the report and submit to EPA for further appraisal. If an EMP is required, follow Step 5.
4	EPA will issue a decision on the Environment Assessment and request to either: (i) prepare an EMP or; (ii) and Environment and Social Impact Assessment. For an EMP, follow Step 5; and for an ESIA, follow Step 7
5	Proponent will prepare an EMP and submit to EPA for approval.
6	EPA will evaluate the EMP and issue an approval. No further approvals are required after an **EMP approval is granted.**
7	Proponent will prepare and submit an EIA report.
8	EPA will evaluate and either: (i) request additional information or; (ii) **issue a Decision Note**. If a Decision Note is issued, no further approvals are required. If additional information is required, follow Step 9.
9	Proponent will prepare the additional information and submit to EPA.
10	If the additional information is adequate, EPA will issue a **Decision Note.** If inadequate additional requests can be made and Step 9 will need to be followed. EPA reserved the right to reject a project if there are significant environmental impacts that cannot be substantially mitigated. This situation is very unlikely for the ASPIRE projects, given its low impacts.

Note: All the application forms are available from EPA website: www.epa.gov.mv.

APPENDIX D – STUCTURE OF AN EIA

The Environment Impact Assessment (EIA) Report would cover the following sections and is based on the EIA regulations 2012.

Cover Page: Should contain the project title, location(s), consultant names, proponent names and date

Executive Summary: Should be prepare in local language or if the report is in English, in both Dhivehi and English.

Introduction: A brief summary of information relating to the proponent, contractors, costing and terms of reference.

Project description: A brief description of the project including its rationale, objectives, main components, activities, work plan, project management arrangements, inputs (such as solar panels, inverters, water for panel washing) and expected output (including solar panel decommissioning waste).

Analysis of Alternatives: This section would address alternatives for the proposed action, which would include the "no project" alternative as well as other alternatives considered before selecting the proposed action. These may include alternative sites and solar panel types.

Legal and regulatory considerations: A summary of the pertinent legislation, regulations and standards, and environmental policies that are relevant and applicable to the proposed subproject, and identify the appropriate authority jurisdictions that will specifically apply to the project. Include permits, approvals and agreements (including roof-lease agreement, if available) in the EIA document.

Description of the environment: A summary of existing conditions around the site, including any vegetation cover present, adjoining building and how their widows are arranged. An assessment of social conditions in the proposed facility and surrounding buildings may be required.

Potential Impacts: This section would identify potential environmental impacts that may arise as a result of the proposed project. All cumulative effects will be considered – positive and negative, direct and indirect, long term and short term. A stronger focus should be on social impact assessment, particularly surrounding buildings and social equity issues.

Mitigation Measures: This section would include a detailed explanation of how the potential environmental impacts identified above could be mitigated.

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

Environmental Management Plan: Considering the nature of the sub-projects, it is unlikely that any major or irreversible environmental impacts will be encountered. Therefore, the most important section of the EIA would be the section on Environmental Management Plans (EMPs). Prediction of potential adverse environmental and social impacts arising from project activities will be at the core of the environmental impact assessment process. By following the procedure described in this document and the EIA Regulations 2012, the environmental assessments to be conducted under the Project will be able to identify environmental and social impacts as a result of implementing the sub-projects. While impact identification is important, an equally essential element of this process is to develop measures to eliminate, offset or reduce impacts to acceptable levels during implementation and operation of the projects.

The integration of such measures into project implementation and operation is supported by clearly defining the environmental requirements within a EMP. EMPs provide an essential link between the impacts predicted and mitigation measures specified within the EIA and implementation and operation activities. The plan outlines the anticipated environmental impacts, the mitigation measures to minimize these impacts, responsibilities for mitigation, timescales, costs of mitigation and sources of funding.

The ASPIRE subprojects are classified as Category B Projects. World Bank guidelines state that detailed EMP's are essential for Category A projects, but for many Category B projects, a simple EMP may suffice. The EMP will address the following aspects:

- Summary of impacts
- Description of Mitigation Measures
- Description of Monitoring Programs
- Institutional Arrangements/responsibilities
- Implementation Schedule and Reporting Procedures
- Cost estimates and sources of funds

No fixed format has been suggested for EMPs but the table below provides an example of an EMP to be placed within an EIA.

Anticipated Affect	**Mitigation**	**Monitoring**	**Responsibility**	**Schedule**	**Cost and financing**

APPENDIX E – STUCTURE OF AN EMP

The Environment Management Plan Report submitted spate to EPA would cover the following sections and is based on the EIA regulations 2012.

Cover Page: Should contain the project title, location(s), consultant names, proponent names and date

Executive Summary: Should be prepare in local language or if the report is in English, in both Dhivehi and English.

Introduction: A brief summary of information relating to the proponent, contractors, costing and terms of reference.

Project description: A brief description of the project including its rationale, objectives, main components, activities, work plan, project management arrangements, inputs (such as solar panels, inverters, water for panel washing) and expected output (including solar panel decommissioning waste).

Social and Environmental Management Plan:

The following sections should be covered:

- Description of likely impacts
- Description of mitigation measures
- Description of monitoring programs
- Institutional arrangements/responsibilities
- EMP Implementation schedule
- EMP reporting procedures, formats and timing
- Cost estimates and sources of funds

Conclusions

APPENDIX F – PERFORMANCE STANDARDS