

1 Environmental and Social Screening Report: Installation of 3 MW Ground Mounted Solar PV in Addu City Hithadhoo, HulhudhooMeedhoo and Feydhoo Land Areas

The Screening Report must include a copy of the technical engineering design for the proposed intervention (where available), at least preliminary concept and description of the proposed project activity.

A. Description of Intervention

Project Identification

Project title	Installation of 3 MW solar PV Installation in Hithadhoo, Feydhoo and HulhudhooMeedhoo under Accelerating Sustainable Private Investment in Renewable Energy (ASPIRE) project
Project Proponent	Ministry of Environment

Project Location

Location	<p>(Location Map and Site Photographs to be Annexed): Attached in Annex1</p> <p>Addu City is the second-largest urban area in Maldives, in terms of population, with a resident population of 26,635 (NBS, 2020). It is the southern-most atoll in the Maldives. It is one of the three urban areas to get the status of "city" other than the capital city, Malé. Addu City has 6 administrative islands. They are Hithadhoo, Maradhoo-Feydhoo, Maradhoo, Feydhoo, Hulhudhoo and Meedhoo. Of these Hithadhoo, Maradhoo-Feydhoo, Maradhoo and Feydhoo are linked by a link road. These islands are also linked to the international airport located in Gan. Hulhudhoo and Meedhoo are located separately in the eastern rim of the atoll.</p> <p>The resident population distribution as per each administrative island of the city are described below (NBS,2020):</p> <ol style="list-style-type: none">1. Hithadhoo: 13,0852. Maradhoo: 2,8363. Maradhoo-Feydhoo: 1,3774. Feydhoo: 4,0965. Meedhoo: 2,1716. Hulhudhoo: 1,505
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FIGURE 1 MAP OF ADDU

In terms of economic activities it is home to one of the three international airports in Maldives, i.e. Gan International Airport. In addition, Hithadhoo port is one of the four ports in the entire country. As for tourism, Addu City is home to 03 resorts, 01 city hotel and 08 guest houses. Other economic activities undertaken include fishing and agriculture. Agriculture is especially prevalent in Hulhudhoo and Meedhoo islands of the city.

Addu is also a city with notable environmental features, as it is home to the largest protected area network in a single atoll in Maldives. Promoted as Addu Nature Park, the park currently consists of 3 Protected Areas; Eydhigali Kilhi and Koatthey (Figure 9) wetland and marine area, an year round manta point off Kandihera-Maakandu channel and British Loyalty shipwreck. In addition, on 09th September 2020, 04 new areas were declared as protected in Addu. These areas include, Maakilhi, Medhe-aara and Fehele kilhi in Hithadhoo, Maafishi Kilhi' (Keyvakaa Gon'do) in Hulhudhoo, and Mathi kilhi at the intersection of Hulhudhoo and Meedhoo, as protected areas. With these additional areas, Addu was declared a UNESCO biosphere reserve on 28th October 2020.



FIGURE 2 PROTECTED AREAS IN ADDU

Addu City also has a notable historical significance with the Royal Airforce (RAF) base being established in Gan during World War 2 by the British. The people of the island speak a unique dialect of Dhivehi language.

Definition of Project Area

(The geographical extent of the project & areas affected during construction)

This screening form specifically concerns three land based sites in Hithadhoo, Feydhoo and Meedhoo. In terms of locations four sites are identified one each in Feydhoo and Meedhoo and two from Hithadhoo (Annex 1). Underneath the panels each of these sites are proposed to be used for the intended purpose of the council. This way PV panels are seen to add value to land rather than loss of land. In this regard the following uses are identified:

Location	Intended Purpose
Addu Football Stadium (Hithadhoo)	For Parking
Hithadhoo Harbour	For “Sunday” Market
Feydhoo Harbour	For “Sunday” Market
HulhudhooMeedhoo site near STP	For Parking

Given below is a description of the project:

- (a) Addu Football Stadium (Hithadhoo): Parking Areas for the stadium identified by the council was selected at this location. A total area of 5252 m² is designated for solar installation (Figure 3 and full scale image in Annex 1). Parking Areas are designated to the east of stadium and either side of the main viewing stand.



FIGURE 3 PV INSTALLATION AREA AT ADDU FOOTBALL STADIUM

- (b) Hithadhoo Harbour: A total area of 5575 m² is allocated at this site (Figure 4 and full scale image in Annex 1). The council plans use underneath the panels as a market space where local food growers can sell their products. Ministry of National Planning, Housing and Infrastructure (MoNPHI) requires a minimum of 5 meter setback for any footings placed for the PV structure from the harbor quay wall. The distances as required by the Ministry are maintained when allocating space for installation. Moreover as the panels cover part of the existing road it is a requirement of MoNPHI to maintain height of the panels at 04 meters.



FIGURE 4 PV INSTALLATION AREA AT HITHADHOO HARBOUR

- (c) Feydhoo Harbour: A total area of 14725 m² is allocated for PV installation (Figure 5 and full scale image in Annex 1). The council plans to use underneath the panels as a market space where local food growers

can sell their products. The space was reclaimed during 2015 during harbour construction works.



FIGURE 5 PV INSTALLATION AREA AT FEYDHOO HABOUR

- (d) HulhudhooMeedhoo near STP: An area of 7200 sqm has been allocated by the council for installation of Solar PV in HulhudhooMeedhoo (Figure 6 and full scale image in Annex 1). Underneath the panels the council plans to use as parking space. (Figure 6).



FIGURE 6 PV INSTALLATION AREA AT MEEDHOO

All these sites were identified and provided by the Addu City Council, as these sites are within the council jurisdiction.

Adjacent land and features

In terms of locations four sites are identified one each in Feydhoo and Hulhudhoo-Meedhoo and two from Hithadhoo (Annex 1). All these areas are

owned by the city council. The description of adjacent land features are described below:

- (a) Addu Football Stadium (Hithadhoo):.The adjacent feature in this location includes stadium infrastructure which includes a football pitch with running track, together with volley ball courts and a basketball court (Figure 7).



FIGURE 7 ADJACENT LANDUSE TO ADDU STADIUM SITE

- (b) Hithadhoo Harbour: This site is parallel to Hithadhoo harbor. Towards the sea on the north eastern side is the harbour and landward side southwest of the site mostly industrial and commercial spaces as per landuse plan (Figure 8 and Annex 5). As can be seen from figure 8 these locations are right adjacent to the PV installation site. This includes a warehouse of State Trading Organization (STO), a fish factory of MIFCO, Hithadhoo Fish Market, a café and a mosque. Consultation with land owners of these sites should be a priority when undertaking the ESIA assessment, as the work is undertaken right adjacent to the sites and can lead to slight restrictions to access when works are undertaken.



FIGURE 8 ADJACENT LANDUSE HITHADHOO HABOUR SITE

(c) Feydhoo Harbour Reclaimed Area: This area has not been used for any productive purpose at present. The area was reclaimed in 2015. In terms of nearby existing infrastructure, at the western side reclamation land there are no other infrastructure, however the eastern side of the harbour, fuel supply shed and the main the ferry terminal and bus terminal is located (Figure 9). These infrastructure are around 450 meters east of the proposed site. Moreover, the location is around 07 meters from the link road, one of the longest stretches of roads in the Maldives, a busy highway that connects all the inhabited islands of Addu except Hulhudhoo, Meedhoo. At the opposite end of the link road is residential and some commercial developments including many restaurants and shops (see below). These infrastructure are around 18 meters from the PV installation area.



FIGURE 9 ADJACENT LANDUSE TO FEYDHOO HABOUR SITE

(d) Hulhudhoo Meedhoo: In terms of land use the site is located on right adjacent the periphery wall of the sewerage treatment plant location. Other sites close by include Island Waste Management Centre located 50 meters north of the site and Maakilhi protected wetland area located 05 meters west of the site (Figure 10). Around 01 meters south of the site are private agricultural lands. Note that historically the cleared part of this site was used as a landfill location, this was prior to construction of Island Waste Management Centre.



FIGURE 10 LANDUSE AROUND MEEDHOO SITE

. Project Justification

<p>Need for the project</p> <p><i>(What problem is the project going to solve)</i></p>	<p>This project is needed to achieve the objectives of the Strategic Action Plan (SAP) 2019 to 2023 (https://presidency.gov.mv/SAP/) of the government which has clear targets to achieve in terms of renewable energy. In this regard, the target of the government is to achieve 20 percent increase of renewable energy in National Energy mix by 2023 when compared to 2018 levels (Target 2.1). This project will facilitate to achieve this objective.</p> <p>As identified in the social survey of the project Annex 4 of the report, the project aims to resolve many of the issues that exist in the power generation system of the island at present. Currently it is all diesel generated power in the island. By switching majority of daytime electricity generation to renewable energy the system becomes environmentally more sustainable. In addition, PV installation means less burden on existing generators, increasing efficiency of generators, hence less power disruptions are expected. Frequent, blackouts are one of the issues identified by the survey respondents.</p>
<p>Purpose of the project</p> <p><i>(what is going to be achieved by carrying out the project)</i></p>	<p>As per the Strategic Action Plan (SAP) 2019 to 2023 (https://presidency.gov.mv/SAP/) of the government it is a target (Target 2.1) of the government is to achieve 20 percent increase of renewable energy in National Energy mix by 2023 when compared to 2018 levels. To attain this target ministry aims to achieve 70% of peak load of electricity from renewable energy sources from all inhabited islands. This project facilitates to achieve this objective in Addu. This project when implemented will achieve 161% of peak load of</p>

	<p>electricity from renewable energy sources in the main grid of Addu. This includes in addition to the sites screened through this, 09 MW worth of floating solar.</p> <p>The selection of islands are based on a policy decision. As this is utility scale project, for this project priority was given for larger islands with bigger population and hence more electricity demand. Outside the capital region Addu City is the most populous city in Maldives</p>
<p>Alternatives considered <i>(different ways to meet the project need and achieve the project purpose)</i></p>	<p>While as alternatives the GoM can explore other sources of renewable energy like wind or floating solar, in terms of the currently trailed and developed technology and context in country, Solar PV on land is most viable in terms of environment condition of Maldives, available technology and costs. In terms of renewable energy costs, utility scale solar PV is at USD 0.068 per Kilowatt- hour (kWh), for onshore wind it was USD 0.053/kWh and for offshore wind USD 0.115/kWh (source: https://www.irena.org/publications/2020/Jun/Renewable-Power-Costs-in-2019) . Cost of Solar PV is progressively falling with 82% decline from 2010 to 2019, compared to this wind energy decline 40% within the same period. Even though inshore wind is cheaper at current rate, at an urban area like the proposed solar PV is more ideal considering the scenic impacts, electromagnetic interference and noise impacts.</p> <p>Global Horizontal Irradiance (GHI) is the total amount of shortwave radiation received from above by a horizontal surface. This value is of particular interest to photovoltaic installations and is used to determine potential of geographical areas for solar PV installation. Research suggests GHI values for Maldives are consistently high, with an average between 5.4.kWh/m² and 5.7 KWh/m². The highest GHI is identified in the South of the archipelago, where average daily sums exceed 5.6 kWh/m² (yearly sum about 2050 kWh/m²) and more. The season of highest irradiation with daily sums above 6.2 kWh/km² lasts three months (from February to April). Second season of higher solar radiation, with daily sums from 5.3 to 5.6 kWh/m², is found in a period from August to October (source: https://www.esmap.org/node/3298) .</p> <p>Another option is to put Solar PV on roof tops however since a number of roofs will need to be attained for this purpose and due to long term nature of the project, land areas which can be used for multiple purposes are the most ideal. Rooftops are considered not the most ideal because of the scale of the project and duration. 1 ha of roof space will be needed to install solar PV on the roofs. Will be difficult to find such large space for solar installation on rooftops on small islands. Furthermore, legally this will require agreements to be signed with multiple roof owners hence more likely to have complications. Moreover, rooftops are uncertain in terms of renovations needed to buildings within 15 years. If rooftops new buildings need to be prioritized which are not in abundant supply in most islands. Hence in islands where there is space that can be given for the purpose of the project land areas and lagoon areas are preferred.</p>

Project Description

Proposed start date	April 2021
Proposed completion date	July 2023
Estimated total cost	Total cost will depend on the investor selected
Present land ownership	<p>Addu City Council, Approval from Ministry of Planning, Housing and Infrastructure attained for solar PV installation. An MOU has been signed with the Addu City Council for this purpose.</p> <p>The MOU guarantees the following key points:</p> <ul style="list-style-type: none"> ✓ Agreement between ME and the landowner securing the sites ✓ Utilize any fees that is acquired through the sites via the investor for the benefit of the community ✓ Resolution of issues that arise during project implementation through the Grievance Redress Mechanism (GRM) and disputes through the lease or license agreement ✓ Ensuring that no cost will be incurred by the council for the purpose of project implementation.
<p>Description of the project</p> <p><i>(with supporting material such as maps, drawings etc attached as required)</i></p>	<p>The project involves installation 3MW of ground mounted Solar PV in Addu city Hithadhoo, HulhudhooMeedhoo and Feydhoo (Annex 1). The project will be implemented by an investor selected through a bidding process. Annex 1 shows the map of solar installation sites. Above section on adjacent land provides additional details regarding the overall area of installation.</p> <p>The general procedure involved in installation of ground mounted structure are described below:</p> <ol style="list-style-type: none"> (1) Site clearance if any (2) Foundation works (pad footings or screw piling) (3) Erection of steel structure (4) PV installation including (5) Installation of inverters, meters and protective equipment <p>Once the panels are installed. The connection will occur to the grid of each island. Which will involve underground burying of cables. An outdoor transformer will be placed at each location to step-up the voltage to deliver the renewable energy to the utility grid.</p> <p>For detailed description check Annex 2.</p>
Project Management Team	<p>The project management team from the Ministry of Environment side includes the following members:</p> <p>Maumoon Khalid: Project Manager</p>

	<p>Thaalooth Rasheedh: Financial Management Specialist</p> <p>Mohamed Hamdhaan Zuhair: Environmental and Social Safeguards Specialist</p> <p>Abdulla Afsal: Procurement Management Specialist</p> <p>Ifaad Waheed: Communications Specialist</p> <p>Akram Waheed: Senior Energy Specialist</p> <p>Nuzhath Ahmed: Project Coordinator</p> <p>Aminath Hanaan Mohamed: Monitoring and Evaluation Specialist</p>
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B. Site Description Questionnaire

1. Site Setting and Land use/Ownership

a) Who is the owner/occupier of the site (refer to land registry/title deed)?

Please find attached the land approval from planning ministry. The land is owned by Addu City Council. An MOU was signed with city council confirming the sites (Check Annex 6 and 7).

b) What is the current land use of the site?

- (1) Addu Football Stadium: The area proposed is currently used for vehicle parking hence, will add value for this activity.
- (2) Hithadhoo Harbour: Currently the area is used as a road, however following solar PV installation the council plans to use the area as “Sunday” market purpose. The Panels are located such that loading and unloading activities of the harbour are not disrupted.
- (3) Feydhoo harbour reclaimed area: This area at present is not used for any productive use. The council aim to develop the area as a “Sunday” market area.
- (4) HulhudhooMeedhoo: Historically this site has been used as a landfill site, prior to construction of Island Waste Management Centre.

c) When was the site first developed to the current land use?

- (1) Addu Football Stadium: The stadium went renovation latest in 2014, as this was the location where some of the matches of 2014 AFC challenge cup was hosted.
- (2) Hithadhoo Harbour: Hithadhoo harbour was developed in a reclaimed land during the 1990s. The harbour has undergone expansion and renovation following the initial development. Renovation and repair of quay wall of the harbour is planned for this year.
- (3) Feydhoo harbour Reclaimed Area: This area was reclaimed in 2015. Reclamation projects are primarily undertaken to provide land for reclamation purpose as justification. However, majority of reclaimed land in Maldives remain unutilized.
- (4) HulhudhooMeedhoo: This site was previously used as a landfill site prior to development of Island Waste Management Centre.

d) What is the historical land use of the site prior to the current development of the site?

Historical land use for these sites are same as the current landuse, except for HulhudhooMeedhoo site, as previously noted this site was used as a landfill site prior to construction of Island Waste Management centre.

- e) What is the current land use of the properties surrounding the vicinity of the site and adjacent to the site? (Request for land use plan with planned developments at the island/note land use during site vicinity walk around);

Described in detail for each site under “Adjacent land features” above.

2. Consultations with island council/local communities and civil society organization

Minutes of the meeting undertaken with the council is provided in Annex 3. Outcomes of the online social survey that was undertaken in coordination with the council for the purpose of screening is attached to Annex 4.

For this environmental and social screening phase, consultation was undertaken with the council and an island wide survey was undertaken online by coordinating with the Addu city council. In addition to the sites surveyed for this screening, all other locations including three marine sites proposed for PV installation was included as part of the survey. The details of these are provided in Annex 3 and 4 respectively.

A total of 115 responses were received from Addu for the survey. This represents around 0.54% of the resident population. The responses from both genders were quiet similar with 57.90% of survey respondents being men and 42.10% of survey respondents being women.

Majority of the respondents are youth of the island with 25 to 45 years being the dominant age group (Figure 2). 73.70 % of those who are surveyed are married (Figure 4). In terms of employment the majority of those who are surveyed are employed (76.3%). In terms of sector of employment, the majority of the respondents were government sector employees, with 42.1% of survey respondents.

Based on the survey results, overall it can be seen that the public of Addu are very keen and positive regarding the project. With 96.4% of the surveyed public suggesting that Solar PV installation is beneficial. For solar PV component, the text analysis done identified inherent environmental benefits and expectation for reduction in cost of electricity as the main benefits.

In terms of location, all the selected locations had an approval rating above 65% of the survey respondents (HulhudhooMeedhoo site was not included as part of this survey as the site was not finalized at the time by the council, this area can be investigated further during ESMP preparation phase). In terms of comments received, some were not happy that land areas are utilized for the project, while others were not happy that marine areas were used for the purpose of the project, few were not happy that panels were not located in their island and some suggested in their view better alternative locations. However, in general the respondents were positive regarding the project and the locations with very few raising specific concerns. In terms of impacts, not much was highlighted by the public and all impacts highlighted could be appropriately managed by appropriate mitigation measures.

Additional information required from island council:

1) Current and projected population;

The resident population for Addu City Predicted for 2020 (based on Maldives Population Prediction 2014 to 2054)

Total: 25043

Male: 14495

Female: 10,549

For the islands chosen for this screening the population estimates for 2020 are as follows:

(a) Hithadhoo
Total: 13,085
Male: 7,564
Female: 5,521

(b) Feydhoo
Total: 4,069
Male: 2,373
Female: 1,695

(c) Meedhoo
Total: 2171
Male: 1238
Female: 934

(d) Hulhudhoo
Total: 1505
Male: 898
Female: 608

2) ***Number of households (and Empty houses);***

As per the census of 2014 the number of households are provided below

(a) Hithadhoo: 10,587
(b) Feydhoo: 3322
(c) Meedhoo: 1871

Note: Empty plot information was not available from the census data.

3) ***Planned development activities; (please see section above and attached Landuse plan in Annex 5)***

4) ***Present employment by industry;*** As per household income and expenditure survey of 2016 which has data for Addu city the distribution is as follows:

Agriculture: 5%
Other Industry: 20%
Service: 74%

5) ***Income distribution;***

Based on household income and expenditure survey of 2016 for Addu Labour Force Participation rate is 46.1 % and as per the survey on average women earn MVR54.09 per hour while men earn on average MVR60.78 per hour

6) ***Public health status.***

A tertiary hospital is located in Addu City Hithadhoo. The hospital have equipment and resources required to address most of the specialty areas in the health sector. In addition to this radiology and laboratory services are available. This is one of the biggest hospitals outside capital Male' region.

C. Screening for Potential Environmental Impacts in relation to the proposed project intervention

	Screening question	Yes	No	Significance of the effect (Low, moderate, high)	Remarks
Section A: General					
1	Will construction and operation of the Project involve actions which will cause physical changes in the locality (topography, land use, changes in water bodies, etc)	Yes		High to Moderate	<p>No significant change is expected in terms of landuse, as the PV panels are planned to be installed in locations where planned and existing landuse are complemented.</p> <p>However, vegetation will need to be removed and relocated from the two sites in Hithadhoo and from the HulhudhooMeedhoo site.</p> <p>In this regard, for the stadium in Hithadhoo some vegetation needs to be removed for the purpose. A total of 6 palms and 19 trees could be found in the eastern parking site (see figure below). As for the site on the north-western periphery, only one tree falls in the exact footprint. As for the south-western site, again only one tree falls on the footprint.</p> <p>Location map with trees marked (note clearer larger map provided in Annex 1)</p>

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(a) Eastern location picture



(b) South Western location picture



As for Hithadhoo harbour a total of 41 trees and palms fall within the proposed footprint. Hence will need to be removed for installation. The location predominantly comprises of Casaurina trees. Location map with trees marked is given below (note: clearer larger map provided in Annex 1)

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In terms of HulhudhooMeedhoo, the site consist of approximately 54+ trees and 200 palms within the boundary. These will need to be removed from the site for the purpose of the project. Location map with trees marked is given below (note: clearer larger map provided in Annex 1)



Feydhoo location as it is recently reclaimed no significant vegetation is found in the location, hence vegetation removal is not anticipated.



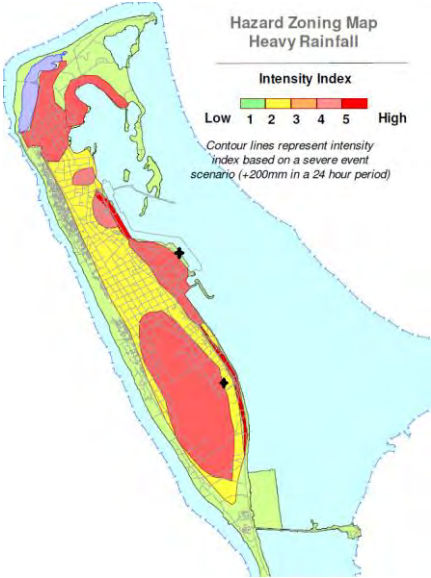
As per the land use approvals (see Annex 6) and consultations held with the council, some conditions need to be met for each site, these can be summarized below:

					<p>(1) Hithadhoo Harbour Location: Need to ensure that a minimum of 10 meters is maintained from the quaywall. Underneath the panels council plan to use as a ‘Sunday’ market space.</p> <p>(2) Addu Football Stadium: The council plan to use this space for parking.</p> <p>(3) Feydhoo Harbour: Underneath the panels the council plan to use as ‘Sunday’ market space</p> <p>(4) HulhudhooMeedhoo: Underneath should be able to use for parking.</p>
2	Will the Project involve use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?	Yes		Moderate	<p>In terms of storage will include the storage of panels, concrete, aggregates, cables and wiring, steel members, water proofing agents, any other treatment chemical approved by civil engineer and small quantities of used oil and fuel for batching plant maybe stored temporarily.</p> <p>Risks may include the following:</p> <ul style="list-style-type: none"> ➤ Risk of spills from fuels, chemicals, waste oil and other hazardous materials used during construction phase. ➤ Health risks associated with storage, handling and transport of Solar PV. <p>Health and safety risks associated with construction work for construction workers and the public.</p>
3	Will the Project produce solid wastes during construction or operation?	Yes		Moderate	<p>Waste generated during construction phase can be categorized as construction waste and general waste.</p> <p>Construction waste will involve packaging, excess soil from earth works, used oil from vehicles and batching plant and any leftover material from cutting material (eg: cut wires, pieces of steel etc). Any construction waste can be first checked whether it can be reused within the island. Whether the island community needs it can be checked</p>

				<p>through the island council. Any remaining waste can be transferred to Regional Waste Management Facility at Thilafushi.</p> <p>General Waste will involve food waste and other general day to day waste from the workers. This waste will be managed through the Island Waste management stream.</p> <p>As for operational phase Solar Panels once the lifetime is up will be a significant waste. The investor may want to replace some panels during operational phase to increase efficiency. In general the life of a Solar panel is expected to be around 25 to 30 years.</p>
4	Will the Project release pollutants or any hazardous, toxic or noxious substances to air?	Yes	Low	<p>Overall, as it is a renewable energy project the project will facilitate to improve air quality, as emissions from diesel powerhouses will be reduced.</p> <p>However, some negative emissions can occur from vehicles used in the project during both construction and operational phase.</p> <p>In addition, dust will become an issue, especially during concrete mixing works. When crystalline silica particles from concrete are inhaled for a prolonged period it can cause diseases like Silicosis, Lung Cancer, Chronic obstruction pulmonary disease and kidney diseases.</p> <p>As all construction materials needs to be imported, this again increases the carbon footprint of the project.</p> <p>As Maldives, at present, does not have a hazardous waste management facility, once the lifetime of the panels are up it</p>

					needs to be transferred to a facility in another country. This transfer will increase the carbon footprint of the overall project. However, it is likely that such a facility will be there before the 20 to 30 year lifetime of the installed panels are up.
5	Will the Project cause noise and vibration or release of light, heat energy or electromagnetic radiation?	Yes		Low	<p>For construction phase, noise will be generated, especially during concrete mixing. However, significant noise is not anticipated as pad footings are considered at this stage as the preferred foundation method. However if piling method is decided following detailed design it can potentially lead to significantly more noise impacts (check Annex 1 project description).</p> <p>At a conceptual level pad footings are considered as the preferred foundation method. Hence vibration impacts are unlikely to occur as piling is not expected for these locations. However if piling is considered following detailed design this needs to be revisited depending on the method used.</p>
6	Will the Project lead to risks of contamination of land or water from releases of pollutants onto the ground or into surface waters, groundwater or coastal waters?	Yes		Low	Contamination during construction phase is likely from leakages that may arise from any chemicals, or hazardous waste that is stored.
7	<p>Will the project cause localized flooding and poor drainage during construction?</p> <p>Is the project area located in a flooding location?</p>	Yes		Moderate	<p>If not properly levelled following construction of panels and cable laying can lead to localized water accumulation.</p> <p>In terms of flooding risk of each site the following can be identified:</p> <p>Addu Football Stadium and Harbour Locations in Hithadhoo: As per the hazard maps that were made in 2007, based on elevation at the time of the survey the stadium area have low to medium flooding potential. As for the harbour location it was determined as having low flooding hazard due to rainfall (see below, the locations are</p>

marked black on the map. Note: that the report identifies that the map was not developed based on a full topographical survey rather an extrapolation of data taken from certain locations. Moreover as this was developed 13 years ago, this map should only be used as an indicative map). As for swell induced flooding both areas have coastal protection, hence is unlikely to be an issue.




Feydhoo Location: Feydhoo location was recently reclaimed. As a general rule in Maldives areas that are reclaimed areas are 1.5 meters above MSL. Considering that 80% of islands have an elevation of less than 1 meters, hence the proposed area is likely to be higher than the surrounding areas, thus flooding risks are minimal.


HulhudhooMeedhoo Location: Topographical information and flooding risk information is not available of this site. However considering the proximity of the site to the wetland area, the topography is likely to be low and hence likely to have moderate flooding risk during heavy rainfall.

8	Will there be any risks and vulnerabilities to public safety due to physical	Yes	Moderate	<p>Some of the risks the public may be exposed during the construction phase include the following:</p> <ul style="list-style-type: none"> ● Falling to open pits
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	hazards during construction or operation of the Project?				<ul style="list-style-type: none"> • Open pits at project site left for a long time can lead to mosquito breeding • Electrocutation due to open wiring • Falling objects as the project involves working at heights • Unattended equipment left in site without proper supervision leading to public use accidents and hazards. • Chemicals (this primarily include water proofing agents, any other approved admixtures used for concreting and used oil) at site left unattended can expose the public to health hazards. • Exposure to dust from concrete mixing. <p>During operational phase the main risks to the public can be identified as follows:</p> <ul style="list-style-type: none"> • Risk of damage to the structure due to lack of maintenance can lead to compromising the structure, which in turn can become a public health hazard. Especially since the site is close to sea special attention should be paid to maintenance issues related to rusting. • The transformer if not enclosed can lead to electrocution risk to public. • Loading and unloading difficulty from the Hithadhoo harbour location if not appropriately designed. • Transport impacts from Hithadhoo harbour location if not appropriately designed. • Potential risk of fire due to faults in electronic equipment. • Potential risk of lightning
9	Are there any transport routes on or around the location which are susceptible to congestion or which cause environmental	Yes		Moderate	<p>Transport route impacts are described for each site below:</p> <p>(1) Hithadhoo Harbour: As this is a harbour location the area is</p>


	problems, which could be affected by the project?				<p>frequented by vehicles used for loading and unloading, it is essential to ensure that this operation is not disrupted as a result of the project.</p> <p>(2) Addu Football Stadium, Hithadhoo: The proposed sites have been designated by the council for parking. Thus can be seen as adding value from a transport perspective.</p> <p>(3) Feydhoo harbour reclaimed area: This area is located as previously described 20 m from the link road. Link road of addu, is known to be an accident-prone highway. Hence special attention should be paid when operating in and around this site.</p> <p>(4) HulhudhooMeedhoo area: This area is located in fairly remote area and there are no major developments at present hence impacts are minor and negligible for this location. As the area is proposed to be used for parking, from a transport issue it can be seen as adding value vehicles used by the utility services perhaps can be parked in this location.</p> <p>In addition, PV cable laying works from each site will impact the transport routes. Again, this is likely to involve some work in the busy link road of Addu. Special measures should be taken to ensure the safety in this road.</p>
10	Are there any routes or facilities on or around the location which are used by the public for access to recreation or other facilities, which could be affected by the project?	Yes		Low	<p>In terms of recreation, the Addu Football Stadium in Hithadhoo, location can have some impacts. However, these impacts can be seen mostly as positive.</p> <p>For the football stadium it provides shade for parking for spectators and players who use the stadium.</p>

11	Are there any areas or features of high landscape or scenic value on or around the location which could be affected by the project?	Yes		Low	In terms of scenic value, if the panels are too low it may disrupt the sea view both in Hithadhoo harbour and Feydhoo harbour locations. Thus, the concept has been designed so that it doesn't interrupt the eye level view.
12	Are there any other areas on or around the location which are important or sensitive for reasons of their ecology e.g. wetlands, watercourses or other water bodies, mountains, forests which could be affected by the project?	Yes		Low to Moderate	<p>Addu Football Stadium in Hithadhoo is 75 meters from the Protected Area at Maa kilhi (see below). This is a wetland area often frequented by birds. Considering the works are undertaken within the boundary of the stadium and since the protected area is one block away, impacts if any will occur due to increased noise. This also considering the work methodology and distance is likely to be negligible.</p>  <p>Moreover, the site in HulhudhooMeedhoo is around 5 meters from the buffer of Mathi Kilhi protected area (see below and Annex for full size image). This wetland area is also frequented by birds. It is important to note that the sites immediately east and west of this location are already cleared and used for services industries. Thus the impacts of are likely to low to moderate, considering the site involves some vegetation clearances.</p>

					 <p>Of the four sites screened, these two are the closest to protected areas.</p> <p>Hithadhoo Harbour location is more than 500 m from Eydhigali Kilhi Koatthey Protected Area and the nearest Protected Area to Feydhoo harbour site is 4 kilometers away. Hence no impacts are anticipated from the works undertaken in these locations.</p>
13	Is the location within or adjacent to the coastal zone? If so, what is the distance to the coast?	Yes	Low	<p>Two of the proposed locations are very close to the coastal zone. In this regard the distances are highlighted:</p> <ul style="list-style-type: none"> (a) Hithadhoo harbour: South eastern section is around 15 meters from quaywall of the harbour. The opposite end of this section includes unprotected coastline which the council plans to reclaim. From this end the site is approximately 5 meters from the coastline (see Annex 1). The northwestern section is approximately 30 meters from the quay wall. (b) Feydhoo harbour reclaimed area: This location is approximately 10 meters from the revetment protecting the reclaimed land (see Annex 1 for location map). 	

14	Are there any areas on or around the location which are used by protected, important or sensitive species of fauna or flora e.g. for breeding, nesting, foraging, resting, migration, which could be affected by the project?	Yes		Low to Moderate	<p>As mentioned in question 12 Hithadhoo stadium location is around 75 meters from Medheari Kilhi Protected Area and the Hulhudhoo Meedhoo site is around 5 meters from Mathikilhi.</p> <p>These areas are frequented by birds. Hence, construction noise can become an issue. However, considering the distance and work methodology impacts if at all are likely to be negligible.</p> <p>Other locations screened here are too far away from any protected areas to cause any impacts.</p>
15	Are there mangrove, coral reef, sea grass bed, turtle beach habitats etc within close proximity?	Yes		Low	See question 12
16	Is the project located in a previously undeveloped area where there will be loss of green-field land		No	N/A	All areas screened here are within urbanized locations.
17	Will the project cause the removal of trees in the locality?	Yes		High	<p>As highlighted previously in question 1 approximately 41 trees and palms will need to be removed from Hithadhoo harbour location and approximately 27 trees/palms need to be removed from Addu stadium location in Hithadhoo. In terms of HulhudhooMeedhoo site 250 trees/palms need to be removed.</p> <p>Where practical and feasible relocation of palms and trees to a location designated by the council should be undertaken through the project. If not 02 trees/palms need to be planted for each palm/tree removed.</p>
18	Can any of the identified historic or culturally importance sites on or around the location be affected by the project?		No	N/A	No known culturally or historically sensitive sites within close proximity of all the four sites.
19	Are there existing land uses on or around the location e.g.	Yes		Moderate	In terms of adjacent landuse the following can be noted:

	<p>homes, gardens, other private property, industry, commerce, recreation, public open space, community facilities, agriculture, forestry, tourism, mining or quarrying which could be affected by the project?</p>				<p>(a) Addu Football Stadium: This whole area is designated for sporting, hence no other significant adjacent landuse. As mentioned earlier in addition to football field the stadium is host to a running track, cricket practice cages, basketball court and volley court. Moreover, as noted previously there is a Protected Wetland Area approximately 75 meters from this site.</p> <p>(b) Hithadhoo Harbour: Hithadhoo harbour has close by industrial and commercial spaces, this includes warehouses and factories. Hence the structural design should enable not to hinder operations of these industrial and commercial establishments. Vehicle operation to and from these locations should not be hindered by the structure. Moreover, the harbour area is often a busy area and the structure should not be a hindrance to loading and unloading activities undertaken at the harbour.</p> <p>(c) Feydhoo harbour reclaimed area: This area at present is barren, council mentioned that recreational activities will be undertaken underneath the panels. Hence the structure should accommodate for recreational activities.</p> <p>(d) Hulhudhoo Meedhoo site: Immediate south of the site agricultural activities are undertaken and to immediate north is the sewerage treatment plant. Around 50 meters away is the Island Waste Management Centre (IWMC). As mentioned previously this</p>
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					area was used as a landfill prior to construction of IWMC.
20	Are there any areas on or around the location which are densely populated or built-up, which could be affected by the project?	Yes		Low	<p>At present none of the solar PV installation areas are densely populated. All the sites are located in areas which are dominated by other activities rather than residential developments.</p> <p>However, the project involves interconnection cable laying. The cables may pass through some residential areas (the exact cable pathway is not yet determined at the time of screening).</p>
21	Are there any areas on or around the location which are occupied by sensitive land uses e.g. hospitals, schools, places of worship, community facilities, which could be affected by the project	Yes		Low	<p>As mentioned previously there is a mosque immediately adjacent to the Hithadhoo harbour site (see below marked as masjid on the map). Work need to be planned such that there are minimal impacts to mosque users.</p> 
22	Are there any Defence Installations / Airport Routes	Yes		Low	<p>The site close to airport is Feydhoo reclamation site. The Gan international airport is approximately 1.5 kilometers from Feydhoo site.</p> <p>As the site is not within immediate footprint of the airport and since it is not within the direct pathway of the approach no direct impacts to airport is anticipated.</p>
23	Are there any areas on or around the location which contain important, high		No	N/A	No Known such sites found close by to any of these locations.

	quality or scarce resources e.g. groundwater, surface waters, forestry, agriculture, fisheries, tourism, minerals, which could be affected by the project?				
24	Are there any areas on or around the location which are already subject to pollution or environmental damage e.g. where existing legal environmental standards are exceeded, which could be affected by the project?		No	N/A	No known such locations close by to any of these sites.
25	Will the project involve treatment of Solid Waste, if so indicate the amounts, nature of waste and briefly describe proposed waste management technologies to be implemented on site.		No	N/A	Does not involve treatment of solid waste, construction waste will be required to be transferred to regional waste management facility at Thilafushi, any domestic general waste generated by the construction work force will be managed through the island waste stream to be managed at the Regional Waste Management Facility at Hithadhoo and Island Waste Management Centre in Hulhudhoo-Meedhoo.

Section B: Specific Screening Questions on Floating Solar

3	Water body identified for floating solar is lagoon, coastal water way, harbor/jetty area or other, please provide details in the comments of the site			N/A	
4	Is the identified water body is used for water supply?			N/A	
5	Is the identified water body used for fishing activities?			N/A	
6	Is the identified water body used for any other human activity, such as recreation, docking of boats etc?			N/A	
7	Will the project activity restrict access to the water body or lead to safety concerns?			N/A	
8	Will the establishment of the Solar PV lead to aesthetic issues on site.			N/A	

Section C: Social Impact Screening

1	<p>Will the project create significant/ limited/ no social impacts? If so please provide details of what they will be.</p>	Yes		Low	<p>As identified in the social survey undertaken for the project (Annex 4), the community mostly sees the project to be beneficial, with 96.4% of the survey respondents suggesting that PV installation will be very beneficial.</p> <p>In terms of location none of the surveyed locations received approval rating lower than 65% from the survey respondents. In terms of comments received, some were not happy that land areas are utilized for the project, while others were not happy that marine areas were used for the purpose of the project, few were not happy that panels were not located in their island and some suggested in their view better alternative locations. However, in general the respondents were positive regarding the project and the locations with very few raising specific concerns. In terms of impacts, not much were highlighted by the public and all impacts highlighted could be appropriately managed by appropriate mitigation measures. Note that the Hulhudhoo-Meedhoo site was not part of this survey as Hulhudhoo-Meedhoo land was not allocated by the council at this time.</p> <p>In terms of social impacts, the project can be seen as mostly beneficial. The key benefits can be summarized below:</p> <ul style="list-style-type: none"> ✓ As rate is much cheaper than diesel, the government can make savings in terms of huge subsidy paid to provide electricity through diesel. This savings can be used by the government for beneficial projects. ✓ The lease/license fee received by the council is conditioned to be utilized for social beneficial project of the community. ✓ Jobs creation within the local community. As through project agreements the investor is required to prioritize locals.
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					<p>With enough PV projects implemented nationally, there is likelihood of reduction of electricity prices nationally. Price of electricity in Maldives is set nationally.</p> <p>The potential negative impacts are mostly related to construction phase. These impacts are already covered in section A question 8.</p>
2	Land acquisition resulting in loss of income from agricultural land, plantation or other existing land-use.		No	N/A	No land acquisition required as the area is side of the road which cannot be used for any other purpose.
3	Land acquisition resulting in relocation of households.		No	N/A	see above
4	Cause any reduction of access to traditional and river dependent communities (to river and areas where they earn for their primary or substantial livelihood).		No	N/A	
5	Cause any displacement or adverse impact on tribal settlement(s).		No	N/A	See question 2
6	Lead to any specific gender issues.	Yes		Low	<p>Like any project there can be gender based violence associated with staff of the construction workforce. However considering the scale and timeframe of work and scarcity of such incidents in other such construction projects in the sector the significance can be determined as low.</p> <p>As for operational phase, to address the gender gap in the energy sector a Gender Action Plan (GAP) was developed for the project. The plan acknowledges and identifies the importance of training women through activities undertaken in the project.</p>

					No gender specific issues were identified by any survey respondents during the survey. The gender response for the survey was very much balanced in Addu.
7	Will the project create significant / limited / no Social impacts during the construction stage?	Yes		Moderate	Risks already covered in section A question 8.
Section D: Impacts of Construction					
1	Will the project lead to flooding of adjacent areas		No	N/A	No, further details have been provided in section A question 7
2	Will it involve the improper storage and handling of substances leading to contamination of soil and water	Yes		Low	Further details have been provided in section A question 6
3	Will the activity lead to elevated noise and dust emission?	Yes		Low	Considering the scale of works will be very limited and only minor nuisance to the public. Noise generated will be mostly due to operation of installation machinery and from batching plant. Dust will mostly be generated during concrete mixing process.
4	Will project activities lead to disruption to traffic movements	Yes		Low	Some disruptions may occur during interconnection cable laying. Also PV installation in the hithadhoo harbour location particularly can lead to some temporary disruptions, as works undertaken in an existing road.
5	Will project activities lead to damage to existing	Yes		Moderate to High	As the project involves digging and certain amount of cable laying, during construction phase possibility of chance

	infrastructure, public utilities, amenities etc.				damage is there. This may include damage to sewer pipes, telephone cables, cable TV lines and water pipes. In such a scenario temporary disruption of these services may occur to certain households. Thus, it is important to attain prior knowledge of existing cables and service pipe locations of the island.
6	Possible conflicts with and/or disruption to local community	Yes		Low to Moderate	<p>The following issues may arise:</p> <ul style="list-style-type: none"> • As highlighted accidental damages to cables and utility lines may occur. This may lead to disruption of service to public. • Difficulties in hithadhoo harbour area during construction may cause issue. • If works undertaken in Addu Football Stadium disrupts recreational activities undertaken there it may cause issues. • Conflicts may occur if any human health impacts occur to the public due to negligence of construction work force. • Moreover, especially if foreign work force is involved conflicts may occur with local community. • The Labour Management Procedures developed for the project needs to be followed to address these issues (link: https://www.environment.gov.mv/v2/en/download/10026).
7	Are there adequate facilities for storage of construction goods & materials	Yes		Low	Addu city have ample reclaimed land which is underutilized at the moment. Especially lot of construction storage and temporary site setup occur in feydhoo reclaimed land. The investor will have to confirm the site for temporary storage and work setup from the council prior to mobilization.
8	Will need to establish facilities for storage of any hazardous material	Yes		Low	Possibly the contractor may have chemicals such as water proofing agents, concrete admixtures, waste oil that needs storing.

9	Facilities for long term housing for operational workers		No	N/A	<p>For a facility like this not much operational staff are required. The investor will be encouraged to employ local staff within the island for the project, or the investor staff maybe based in capital Male' and may visit these sites for routine inspections.</p> <p>Investors will be encouraged to train and involve local community during operational phase of the project as per the contracting arrangements. Therefore it is unlikely that there will be a need for long term house of operational workers on site.</p>
10	Will the construction works (Permanent & Temporary) lead to alterations of the site	Yes		Moderate	<p>The works will involve installation of permanent ground mounted PV panels. Moreover, temporary digging is involved during construction phase.</p>
11	Are facilities for construction workers (temporary labour camp, drinking water, waste disposal, etc.) required during implementation	Yes		Moderate	<p>As suggested above, feydhoo reclaimed land is one such location which has been used previously for this purpose. The exact location will need to be finalized from the council prior to mobilization. An alternative will be to rent a property by the investor.</p> <p>For labour camps some environmental and social risks that are involved can be summarized as below:</p> <ul style="list-style-type: none"> • Lack of sanitation and clean drinking water at the project site. • Over congestion of work force in a small space can lead to disease and other such outbreaks. Often foreign labour in Maldives are housed by contractors in unhygienic and inhumane conditions. • Lack of access to shower facilities. • Food being served in unhygienic conditions. • Lack of availability of adequate meals. • Lack of clearly demarked designated areas for waste disposal can lead to unhygienic

					<p>living/working environment which can lead to disease etc.</p> <ul style="list-style-type: none"> • Areas in living and working quarters where water can collect can lead to mosquito breeding which in turn can lead to outbreak of mosquito borne diseases within the work force. • Pest infestation in the work space and living quarters can lead to unhygienic working/living conditions and can lead to serious disease outbreaks. • If foreign labour is involved social conflicts with the community due to differences in culture. • If project undertaken during Covid 19 situation. Chance of transmission of Covid from the workforce to the community.
12	Are facilities for disposal of solid waste available on the Island- please specify the forms in the comments	Yes		Moderate	Hulhudhoo-Meedhoo has Island Waste Management Centre (IWMC) and Regional Waste Management Facility (RWMF) is located in Hithadhoo. RWMF is planned to be developed as a waste to energy plant. However only domestic general waste produced by the workers will be managed through this site, for construction waste, the investor will be required to take the waste to Thilafushi regional waste management facility as this is the only location that accepts construction waste in Maldives at present.
Section E: Cumulative Impacts					
1	Cumulative effects due to proximity to other existing or planned projects with similar impacts	Yes		Moderate	Lot of new developments likely to occur, especially in the reclaimed land of Feydhoo within the next couple of years. Moreover, many new projects have been announced all across Addu in 2020 as well. Hence in terms of ongoing constructions it can be expected that parallel projects will be running. Information on ongoing government

					<p>projects can be attained through: https://isles.gov.mv/Atoll/Index</p> <p>It is difficult to determine exactly which projects will be running during the construction phase, this will become clearer once the construction schedule is finalized and an investor is selected for the project. During this phase appropriate coordination will be undertaken through the island council.</p>
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8. Project operating requirements

		Yes	No
24	Does the project belong to a prescribed category of the Environmental Protection Authority for EIA		No, But screening will be undertaken in parallel to this World Bank screening
25	Does the project need to obtain clearances from agencies such as the EPA, Island Council, Atoll Council etc :	<p>Yes. The following approval have already been attained (see Annex 7 and 8):</p> <ol style="list-style-type: none"> 1. MOU signed with council confirming the location 2. Ministry of Planning Housing and Infrastructure provided the Landuse approval <p>In addition screening document will be submitted to EPA for a screening decision.</p> <p>As per the ESMF of the project following screening the investor will undertake the required assessments.</p>	

9. Conclusion and Screening Decision

Summary of environmental effects:

Assuming that all mitigation measures are implemented as proposed, the following effects can be predicted

	N/S - Effect not significant, or can be rendered insignificant with mitigation
✓	SP - Significant positive effect
	SN - Significant negative effect

	U - Outcome unknown or cannot be predicted, even with mitigation

10. Screening Decision Recommendation (check one):

	<p>All potentially adverse effects can be classified as general construction related impacts and are mitigatable with known technology and operational impacts are minimal. Public concern does not warrant further assessment.</p> <p>Therefore, standalone Environmental and Social Assessment not required, an Environmental and Social Management Plan would be required prior to the project proceeding.</p> <p>An indicative mitigation plan to the identified risks are provided in Annex 9</p>
✓	<p>Potential adverse impacts are significant, hence, a standalone Environmental and Social Impact Assessment, including an Environmental and Social Management Plan is needed before the project can proceed</p>
	<p>Potential adverse impacts are significant, hence project cannot be justified</p>

11. Details of Persons Responsible for the Environmental Screening

Screening report completed by:

Name and Designation: Mohamed Hamdhaan Zuhair (Environmental and Social Safeguards Specialist, Ministry of Environment)

Date: 14th December 2020

Signature: 

Screening report reviewed by:

Name and Designation: Maumoon Khalid, Project Manager

Date: 14th December 2020

A handwritten signature in blue ink, appearing to be 'Maumoon Khalid', written over a faint rectangular stamp.

Signature:

Approved by: (world bank approved via email)

Name and Designation:

Date:

Signature:

2 Annex 1: Location Map

(a) Hithadhoo harbour



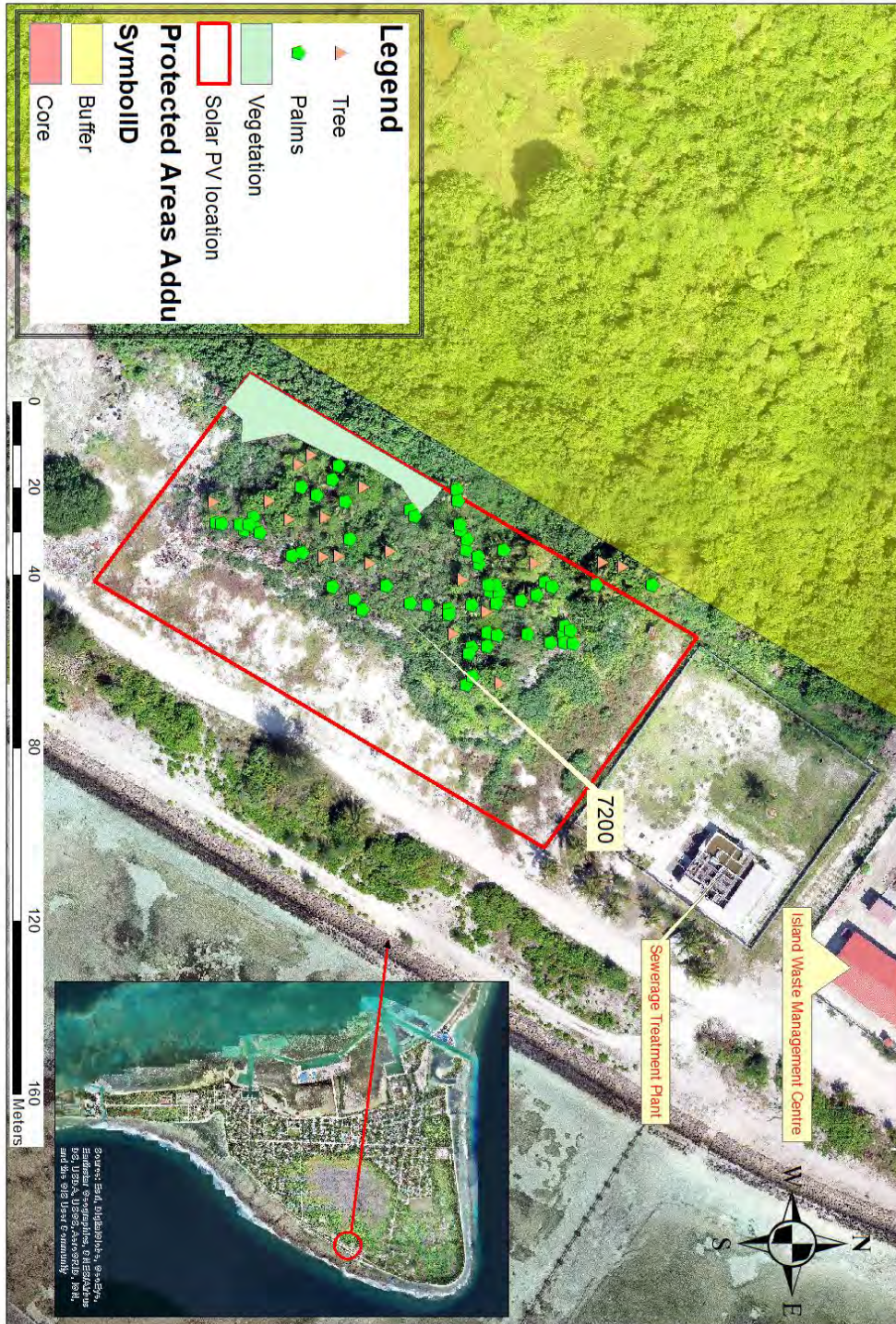
(b) Addu Football Stadium



(c) Feydhoo Harbour Reclaimed Area



(d) Hulhudhoo Meedhoo



3 Annex 2 Project Description

3.1 Accelerating Sustainable Private Investment in Renewable Energy (ASPIRE)

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.

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.

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

This is the third subproject implemented under ASPIRE operations following successful 1.5 MW and 5 MW bid awarding.

3.2 General Description of the project

The project involves installation 2 MW of ground mounted solar PV in Addu city, Hithadhoo and Feydhoo. The locations identified for the project from Hithadhoo is the Hithadhoo harbour location and Addu Football stadium. For Feydhoo the area identified is the reclaimed land west of the harbour. The area designated for each of the sites are summarized below:

Addu Football Stadium: 5575 m²

Hithadhoo Harbour: 5252 m²

Feydhoo Harbour reclaimed area: 14725 m²

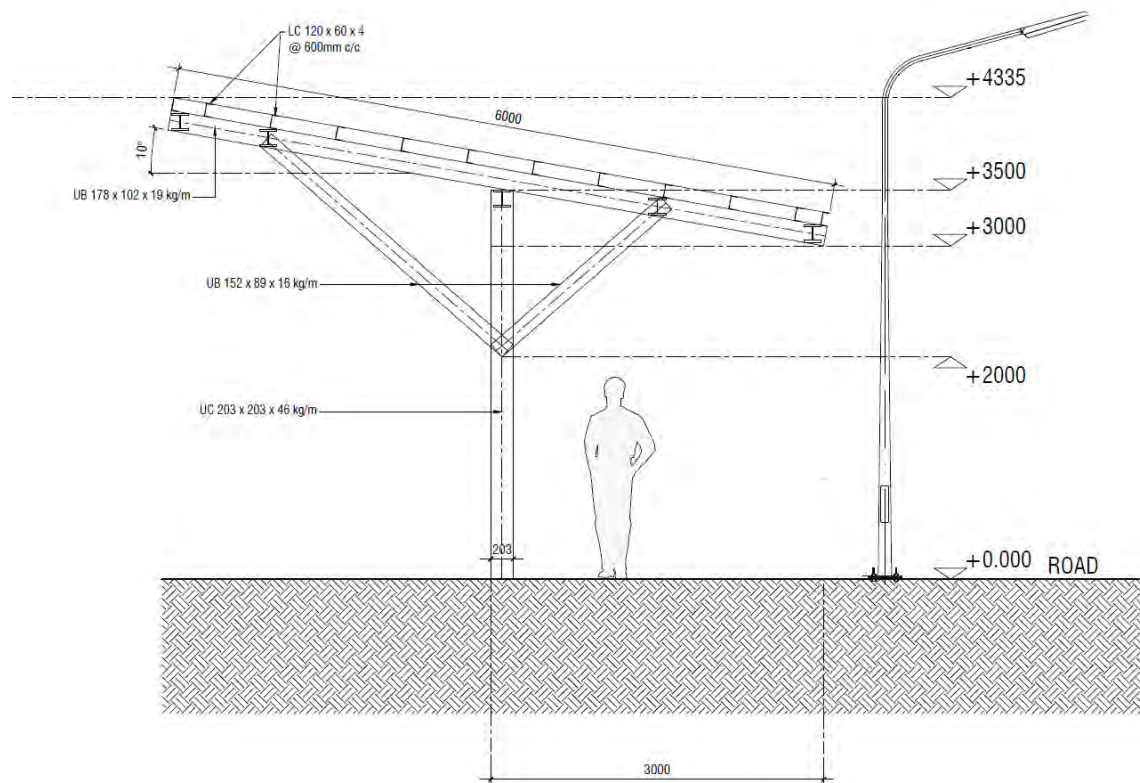
Hulhudhoo-Meedhoo near STP: 7200 m²

The project will be implemented by an investor selected through a bidding process. Annex 1 shows maps of the solar installation sites.

3.3 General Method Statement for construction

3.3.1 Installation of PV Structure

Given below is a conceptual drawing for PV installation.



3.3.1.1 General

This statement will focus on describing the general process of planning, organizing and implementation of ground mounted structures for solar PV using pad footing method. Alternative for this will be to use screw piling method. The detailed method will be determined by the investor.

3.3.1.2 Purpose

Plan, design and build the project parameters as per schedule and delivering a successful outcome. This methodology will briefly explain on how the design stage and construction stage would be carried out. Anticipated difficulties and limits can be identified and tackled in due time giving way to progressive work.

3.3.1.3 Scope

Scope of works associated with this project are

- 1- Site Preparation
- 2- Foundation works
- 3- Erection of steel structure
- 4- Installation of solar panels

3.3.1.4 Site Preparation

Upon site handover, all setting out points, benchmarks, site rails, pegs and other survey points shall be clearly marked and protected from damage or disturbance during the execution of the works. Benchmarks and levels shall be verified by the Contractor and approved by the client. The Contractor will also check the site surveys for dimensional and level accuracy and reporting any discrepancies before building work commences. Working areas shall be cleared from any vegetation or trees or any property of island council. Only necessary trees need to be removed, smaller trees and shrubs should be relocated to another location. For every tree removed, two trees need to be planted at a location identified by the client upon consultation with the island council. Strictly following client instructions for clearance. Special attention given to services running underground.

3.3.1.5 Foundation

3.3.1.5.1 Excavation works and Backfilling

Once the site footing has been marked and approved by the client, excavation work is to commence. Initially, the water table level of the island shall be identified, and if dewatering is to be carried out, it shall be done following EPA guidelines and the island council's regulations and instructions. Special consideration to be taken not excavate below the required depth and not disturb the soil below or surrounding the foundation footings. Excavation shall be done by while supporting the excavated areas by an approved shoring procedure.

Before backfilling is done to the excavated area, all concrete surface shall be applied with approved bituminous waterproofing as per clients approval. Backfilling shall be done in layers of 150mm and to be compacted between layers.

3.3.1.5.2 Lean concrete

Upon completion of excavation works to foundation depth, the surface shall be levelled and compacted to receive lean concrete. Mix ratio for lean concrete shall be in the proportion 1:2:6 (cement: fine aggregate: coarse aggregate) by dry volume. Lean concrete shall be mixed with concrete mixer and completed without breaks in between for a single footing. An approved Damp-proofing membrane to be applied to the top of lean concrete.

3.3.1.5.3 Formworks

Formwork shall be performed to obtain accurate concrete following the design drawings. Formworks are to comply with an approved standard. Formwork shall be firmed and secured to bear the force of concreting and tightened to avoid cement paste seeping.

Sheathing for formwork shall be waterproof film-coated plywood of not less than 12 mm thick. Joint of sheathing shall be butt joint and firmly assembled.

The minimum period for keeping the forms in position and for watering after laying the concrete shall be 24hrs for the pad footings and column stumps.

Forms shall be removed in such a manner as to ensure the complete safety of the structure so that there is no shock or vibration as would damage the reinforced concrete.

3.3.1.5.4 Placing of Reinforcement

All reinforcement shall be inspected by the client and approved before concrete is placed in the forms. Reinforcement intended for contact when passing each other shall be securely tied together with binding wire. The binders shall tightly embrace the longitudinal reinforcement to which they shall be securely bound. Binding wire shall be turned in from the formwork and shall not project beyond reinforcing bars.

The cutting, bending and fixing of the reinforcement to follow an approved standard. They shall be cleaned before use so that it is free from rust, oil, dirt or other coatings that reduce bond.

General specifications shall comply with the requirement of an approved standard and follow the specification of the design drawings.

Nominal reinforcement cover shall be minimum 50mm and maximum 75mm.

3.3.1.5.5 Concrete

Before placing of concrete, all the areas where concrete is to be deposited shall be cleaned, and sheathing shall be sprinkled with water. Subsequently, water accumulated in the form shall be removed.

The concrete mix shall be done by batching plants and delivered to site through transit mixer trucks or mixed on-site with approval of the client.

Maximum free fall of concrete to be maintained below 1.5 meters, from mixer truck to foundation footings.

Once placed, concrete shall be compacted using vibrators with adequately sized pokers. Spare Vibrators shall be made ready at the site for contingencies. Concrete compaction shall be done until the mortar fills the spaces between the coarse aggregates and begins to cream up to form an even surface when this condition is achieved, vibration shall be stopped at compaction area and continued to the next pouring area. The vibrator shall not be operated on the same spot for more than 30 seconds at the same spot.

The maximum time interval between placements of continuous concreting shall not be more than 0.5 hours. However, when special measures are taken, this time limit may be changed according to the instruction or approval of the client. The time limit from start of mixing to completion of placing of a batch, as a rule, shall be 30 minutes. All joints for columns and beams shall be kept rough.

Concrete mix ratio for reinforced concrete shall be as per grades specified in the drawings.

After the concrete has been placed, the concrete surface shall be kept moist by spraying with water for curing for at least 4 days for pad footing and 7 days for column stumps.

3.3.1.5.6 Testing

Slump test

Upon delivery of concrete by transit mixture truck, before placement slump test will be done to ensure w/c ratio and consistency of concrete.

The slump cone is filled to a quarter depths and tamped 25 times. Filling and tamping are repeated three more times until the cone is full and the top smoothed off. The cone is removed, and the slump measured, for consistent mixes the slump should remain the same for all samples tested

Cube test

150 x150 x150mm concrete cubes will be taken from different concrete batches and tested for compressive strength. Cubes shall be taken from different mix batches. Each mould will be filled in three equal layers; 35 strokes with a tamping bar will tamp each layer. The samples will be covered with a damp sock and left for 24hrs before removing the mould. Samples will be wet cured for 7days and 28 days for testing, respectively.

3.3.1.6 Bolted connections

If the superstructure connection with substructure requires bolted connections, it is extremely important that anchor bolts be placed accurately in accordance with the anchor bolt setting plan. All anchor bolts will be held in place with a template or similar means, so they will remain plumb and in the correct location during placing of the concrete.

3.3.1.7 Erection

Erection will shall be done by completing bay by bay. The proper completion and plumbing of this first bay is extremely important. Although several methods are used to erect rigid frames, the best practice is to erect the columns first, tie them together with the girts and tighten the anchor bolts.

After the columns have been erected, the rafter/tie beams is hoisted into place and connected to the columns. The flange brace will be bolted to the rafter prior to raising in order to save time. The hoisting equipment should never be released from the rafter/tie beams until the frame is adequately braced, so it cannot buckle or tip.

3.3.1.8 Lifting cables and spreader bars

In all instances the length of the lifting cables should be such that the angle between the rafter and the lifting cables is no less than 45 degrees .To reduce the severe compression stresses at the ridge of the rafters that are created by the angle of lifting cables, a spreader bar is recommended, which allows the lifting cables to be parallel to each other (Figure 1).

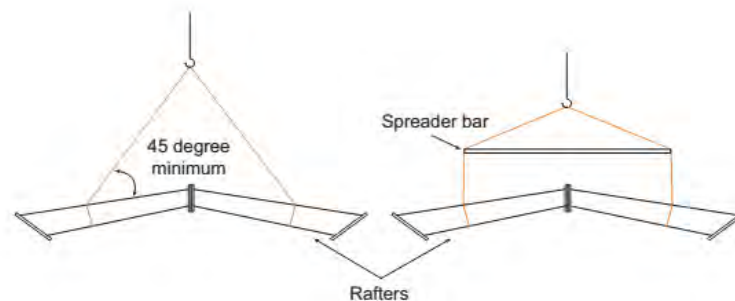


Figure 5. Hoisting cables.

3.3.1.9 Completing and Plumbing the first bay

After the first intermediate or interior frames have been set, all purlins, rafters and girts shall be installed in the braced bay and the entire bay plumbed, aligned and braced before proceeding further. If the structure is designed without cable bracing, temporary bracing shall be provided (Figure 2). When this bay is properly and accurately plumbed and braced, the remaining members, to a large degree, will automatically plumb and align when installed. Only a final check of the building plumb remains, and few adjustments, if any, will be necessary.

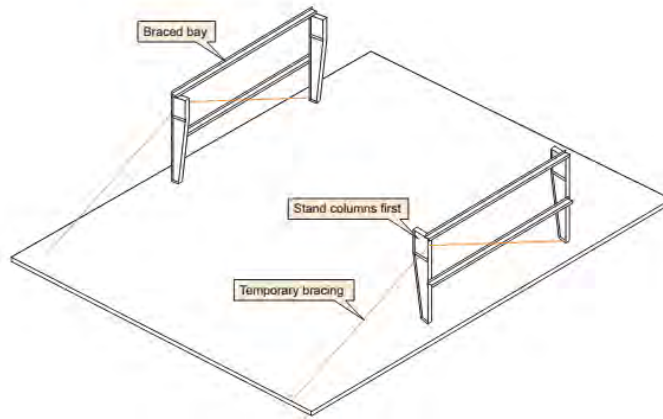


Figure 6. Bay erection and temporary bracing.

3.3.1.10 Precautions when erecting frames

- 1- Rigid frames, especially free ends or cantilevered sections should never be left "for the day" in an unsupported, unbraced or unguyed condition .Such practice has resulted in the total loss of considerable amounts of erected steel because of wind.
- 2- Additional care required in the erection of lighter sections. They are much more apt to buckle during erection, and consequently require greater care in rigging and handling.
- 3- Hoist cable capacity to be verified before hoisting to ensure the cable has the required tension capacity to carry the steel sections.

3.3.1.11 Installation of Panels

Panel installation shall only start after completing the steel structure with bracing and purlins. All connections shall be tested and approved before panel installation.

3.3.1.12 Health and Safety

An independent scaffolding shall be erected to each external faces of the structure. Anyone working on or visiting the site will be required to wear safety helmets and operatives will use other protective clothing (PPE) depending on the type and location of work. The safety supervisor shall attend regular meetings with the planning supervisor and cooperate with site regulations to maintain the client's good safety record. The contractor should comply with the Health and Safety Regulation (2019/R-126) and should comply with the Labour Management Procedure developed for the project.

Care should always be taken when working with panels. Use safety lines and nets when necessary.

Storage and handling of panels shall be supervised at all times and panels shall never be used to walk on or as a platform.

Precautions shall be taken to secure structure during assembly. Temporary bracing may be required to stabilize the structure during erection. The structure shall never be left unbraced at any point during the erection process.

3.3.1.13 Schedule of Implementation

The construction phase of the project is expected to take around 06 months. The investor will operate the facility 15 years and will handover to Fenaka. Maintenance will of the panels will be undertaken by the investor during this 15 year period and afterwards by Fenaka.

3.3.2 Cable Laying

This subcomponent involves connecting the panels to the existing grid of Addu. The preliminary pathway for interconnection are provided below. As can be seen all cables run through existing roads and no vegetation is expected to be removed as a result of this aspect. This will be finalized based on grid assessments.



FIGURE 11 HITHADHOO HARBOUR INTERCONNECTION PATHWAY



FIGURE 12 ADDU FOOTBALL STADIUM INTERCONNECTION PATHWAY



FIGURE 13 HULHUDHOO MEEDHOO INTERCONNECTION PATHWAY



FIGURE 14 FEYDHOO FLOATING SOLAR LOCATION

The following procedure will be followed by investor/contractor when laying the cables:

- Before trenching, the Contractor will obtain information on already existing power cables, communication cables, cable TV cables and sewerage and water mains will be gathered and the route of such cables and pipes identified on the land use plan.
- The Contractor will safeguard the existing infrastructure of various service providers, during trenching. Claims and liabilities arising from such damages will be the responsibility of the Contractor. The Contractor will also be responsible for making good any damage caused by him to public property. Work will be carried out in a manner which will ensure the safety of both the public and the workers.
- Both sides of the trench will be either sloped or protected by other means in accordance with the soil conditions encountered and the safety regulations to be observed.
- Cable lying in open trench for more than two weeks shall be protected against the radiation of the sun.
- Open trenches will be properly secured by red warning tapes on both sides along the trench. Flashing orange colour lights clearly visible from a reasonable distance will be placed around the open trench, at night.
- Cable trench will be cleaned from dirt etc. before closing.
- Trenches will be closed as soon as possible to avoid excessive ingress of dirt, damage and inconvenience to the pedestrians and traffic.

Detailed step by step procedure for cable burying and backfilling is described below:

- First, the trench will be excavated to a depth of 1 m.

- Then the trench will be filled with 100mm thick layer of clean or screened sand. The power cables will be laid on this layer.
- The trench will then be filled with a thick layer of clean or screened sand covering the power cables.
- A yellow plastic warning tape shall then be laid on this layer for the entire length of the cable route, followed by a soft layer of sand carefully rammed. The yellow plastic warning tape will have printed in black the following message;

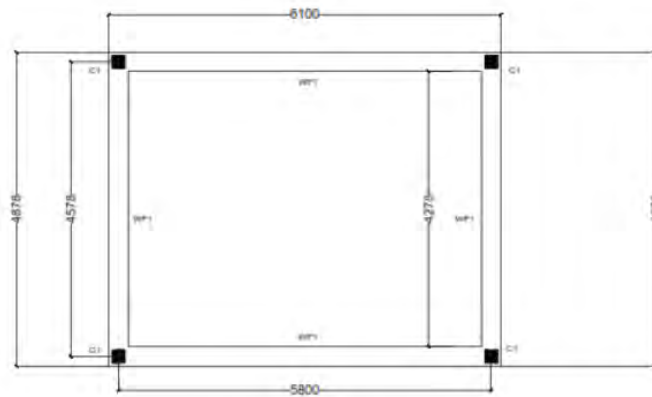
CAUTION CAUTION CAUTION

ELECTRIC CABLE BELOW

- The printing will be repeated at intervals not exceeding 500mm and shall be of adequate font size as per relevant standards. The tape will be made up of polyethylene for durability and shall have a width of at least 150mm.
- The filtered sand will be free from roots, debris, trash and other organic matter.
- In places where LV and MV cables share the same trench, the depth of the trench will be increased to 1100mm. Then after making a bed of 100mm thick layer of clean or screened sand (similar to LV cables), the MV cables will be laid first. The trench will then be filled with 200mm thick layer of clean or screened sand covering the MV power cables. The LV cables shall be laid on this layer and continued as described above.
- Only excavated material for trenching will be used for backfilling. If additional material required imported sand will be used, no sand will be dredged or mined for the purpose of this project.
- The trench will be filled and levelled by the contractor to the existing level prior to trenching.

3.3.3 Transformers

The location of transformers will be placed in each PV location. The outdoor transformer will be placed on a concrete slab of 5 meters by 4 meters. The transformer will be fully enclosed. Foundation details of the transformer slab is provided below.



Foundation Details



Figure 8: A transformer on concrete slab

The transformer will be placed on a concrete slab. The following will be the basic method followed for construction of slab:

1. Clear and Level the required area
 2. Add around $\frac{3}{4}$ inch gravel layer
 3. Install anchor barriers and rebar
 4. Pour concrete, set wall or container anchors
 5. Level the concrete
- The transformer hut will not be accessible to the public.
 - Appropriate warning signs will be displayed outside of the transformer hut.

4 Annex 3: Council meeting Minutes

AGENDA ITEMS

- Survey to be disseminated to public
- Queries on the project
- Land use approval from Planning ministry

DISCUSSION POINTS

- A brief introduction was given on the purpose of the survey and ME requested Council to share the survey on the Councils' Facebook page and other online community groups of the island. ME requested to use any other platforms that would increase the reach of the survey to its maximum.
- Further ME requested to coordinate with the Women Development Committees of the island to increase the reach of the survey to women as typically the number of females responding to survey deemed less.
- Council informed that they will request for land use approval from Ministry of National Planning, Housing and Infrastructure (MoNPHI) before the end of the week and inform ministry of the status.
- ME informed the Council that the PQ for the phase has been published and formal approval of the project is expected to come through in November 2020.

OUTCOMES

- Council to share the survey on Council Facebook page and online community groups.
- Council to request MONPHI for land use approval for ARISE solar PV installation sites.

Attendees Information List:

#	Institution	Name	Designation	Email
1	Addu City Council	Abdulla Sodig	Mayor	
2	Ministry of Environment	Hamdhaan Zuhair	ESS Specialist	hamdhaan.zuhair@environment.gov.mv
3	Ministry of Environment	Maumoon Khalid	Project Manager	maumoon.khalid@environment.gov.mv
4	Ministry of Environment	Ifaadh Waheed	Communications Officer	ifaadh.waheed@environment.gov.mv
5	Ministry of Environment	Aminath Hanaan Mohamed	Monitoring and Evaluation Officer	aminath.hanaan@environment.gov.mv

5 Annex 4: Social Survey Report

5.1 Introduction and Background

5.1.1 Objectives

This report is prepared to outline the outcomes of the social survey that was undertaken for the interventions planned for Addu City under Accelerating Renewable Energy Integration and Sustainable Energy (ARISE) project funded by the World Bank and other development partners. The key activities planned for Addu are as follows:

1. Solar PV installation for 13 MW PV (10 MW of floating solar and 03 MW of land based solar PV).
This includes the following:
 - 08 MW Floating solar in Hithadhoo Port Area
 - 01 MW Floating near Maradhoo harbour
 - 01 MW Floating Solar near Hulhumeedhoo harbour
 - 01 MW from Hulhudhoomeedhoo land
 - 0.5 MW from Hithadhoo Stadium Area
 - 0.5 MW from Hithadhoo harbour Area
 - 01 MW from Feydhoo harbour area
2. Battery Energy Storage System (BESS) Installation of 26 MWH
3. Grid Upgradation

Solar installation will be undertaken by an investor selected through competitive bidding. While BESS installation and grid upgradation will be undertaken through an EPC contractor selected by Project Management Unit (PMU). As per the ESMF the required social and environmental assessments following screening for Solar PV installation will be undertaken by the investor. While for BESS and grid upgradation these assessments will be undertaken by PMU. It is now decided that PV installation on land will be undertaken initially and floating solar installation will be undertaken through a second bid.

The survey was undertaken to fulfill the requirements under the 6.2.2 of the Environment and Social Management Framework (ESMF) prepared for the project and section 5.1 of the Stakeholder Engagement Plan (SEP) developed for the project.

5.1.2 Description of project Location

Addu City is the second-largest urban area in Maldives, in terms of population, with a resident population of 21,198. It is the southern-most atoll in the Maldives. It is one of the three urban areas to get the status of "city" other than the capital city, Malé. Addu City has 6 administrative islands they are Hithadhoo, Maradhoo-Feydhoo, Maradhoo, Feydhoo, Hulhudhoo and Meedhoo. Of these Hithadhoo, Maradhoo-Feydhoo, Maradhoo and Feydhoo are linked by a link road. These islands are also linked to the international airport located in Gan. Hulhudhoo and Meedhoo are located separately in the eastern rim of the atoll.

In terms of economic activities it is home to one of three international airports in Maldives, i.e. Gan International Airport. In addition, Hithadhoo port is one of the four ports in the entire country. As for tourism, Addu City is home to 03 resorts, 01 city hotel and 08 guest houses. Other economic activities undertaken include fishing and agriculture. Agriculture is especially prevalent in Hulhudhoo and Meedhoo islands of the city.

Addu is also a city with notable environmental features, as it is home to the largest protected area network in a single atoll in Maldives. Promoted as Addu Nature Park, the park currently consists of 3 Protected Areas; Eydhigali Kilhi and Koathey Mangrove (Figure 9), Wetland and marine area, an year round manta point off Kandhihera- Maakandu channel and British Loyalty shipwreck. In addition, on 09th September 2020, 04 new areas were declared as protected in Addu. These areas include, Maakilhi, Medhe-aara and Fehela kilhi in Hithadhoo, Maafishi Kilhi' (Keyvaka Gon'do) in Hulhudhoo, and Mathi kilhi at the intersection of Hulhudhoo and Meedhoo, as protected areas. With these additional areas, proposal have been submitted to make Addu a UNESCO biosphere reserve.



Addu City also has a notable historical significance with the Royal Airforce (RAF) base being established in Gan during World War 2 by the British. The people of the island speak a unique dialect of Dhivehi language.

5.2 Methodology

5.2.1 Data Collection

A conference call was held with the island council on 12th July 2020. In the meeting the council was requested to circulate the survey through social media groups. Importance of getting a balanced view from both genders were highlighted and the council was requested to make extra effort to attain views of women. The council highlighted that full support will be provided by the council for the survey and highlighted that adequate response can be attained from the public. The minutes of the meeting is attached to Annex-1 of the report.

The council distributed the survey to public viber groups. The survey was publicized through the council official facebook page and the facebook page of the ministry as well.

Several news articles were also published promoting the survey. In this regard, articles regarding the social surveys undertaken under the project were published through the following local online news platforms:

Media Report about Community Survey on 6 islands – avas.mv

<https://avas.mv/85484>

Media Report about Community Survey on 6 islands – Public Service Media

<https://psmnews.mv/71144>

Media Report about Community Survey on 6 islands – iru.mv

<https://iru.mv/171026>

5.2.2 Analysis

Microsoft excel was used to analyse the data and develop the graphs for all the quantitative data collected for through the survey.

Cost of electricity per person was calculated by dividing the average bill information provided by the respondents by the number of persons in the household.

As for text analysis, on aspects in which there was significant text input from the public, word cloud analysis was done using monkeylearn online tool (<https://monkeylearn.com/word-cloud/>) to determine significant words and phrases used to determine public sentiment regarding the issue explored.

For rest where there is no significant data the few concerns that were raised were just collated for analysis.

5.3 Results and Discussion

5.3.1 General characteristics

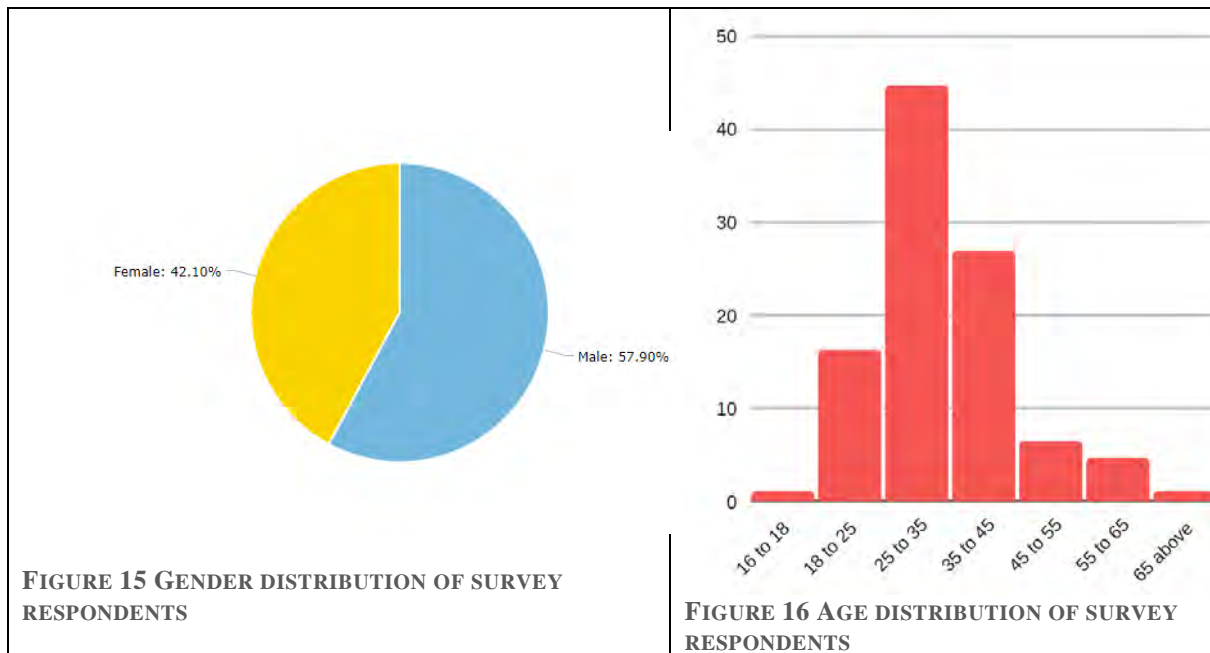


FIGURE 15 GENDER DISTRIBUTION OF SURVEY RESPONDENTS

FIGURE 16 AGE DISTRIBUTION OF SURVEY RESPONDENTS

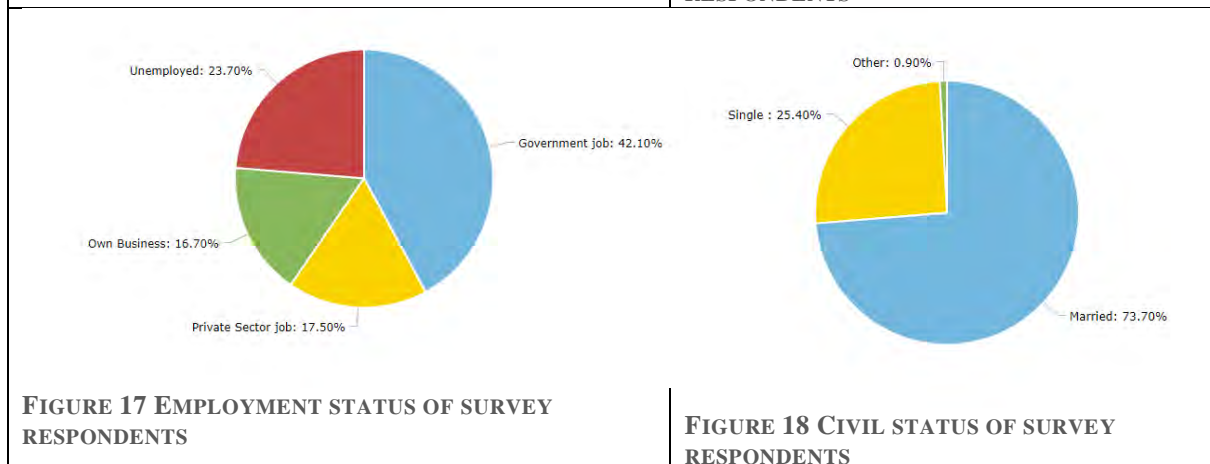


FIGURE 17 EMPLOYMENT STATUS OF SURVEY RESPONDENTS

FIGURE 18 CIVIL STATUS OF SURVEY RESPONDENTS

A total of 115 responses were received from Addu for the survey. This represents around 0.54% of the resident population. The responses from both genders were quiet similar with 57.90% of survey respondents being men and 42.10% of survey respondents being women (Figure 1).

Majority of the respondents are youth of the island with 25 to 45 years being the dominant age group (Figure 2). 73.70 % of those who are surveyed are married figure 4. In terms of employment the majority of those who are surveyed are employed (76.3%). In terms of sector of employment, the majority of the respondents were government sector employees, with 42.1% of survey respondents (Figure 3).

5.3.2 Electricity usage and reliability

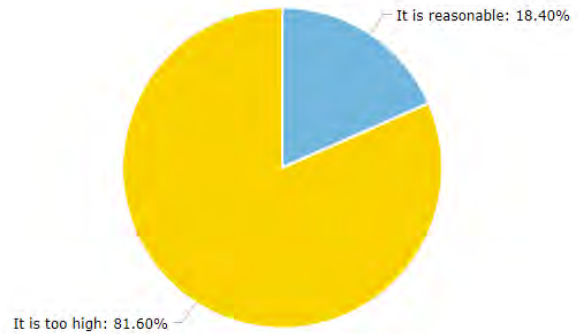
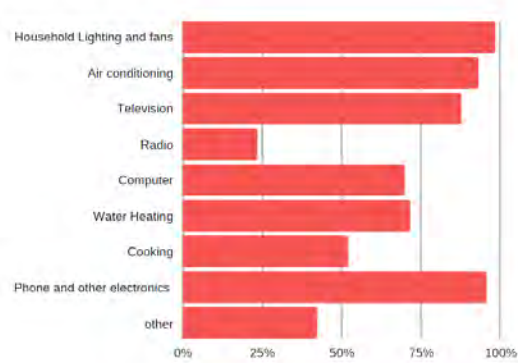


FIGURE 19 HOUSEHOLD USAGE OF ELECTRICITY

FIGURE 20 VIEW ON PRICE OF ELECTRICITY

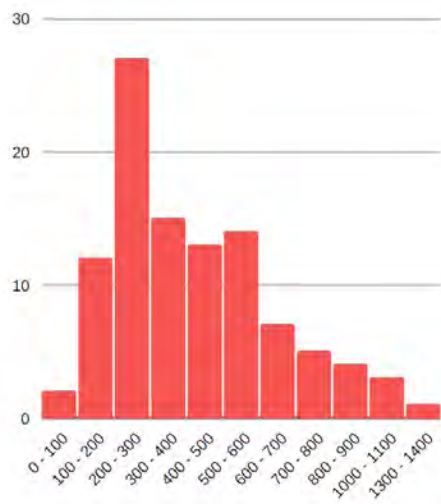


FIGURE 21 COST OF ELECTRICITY PER UNIT HEAD

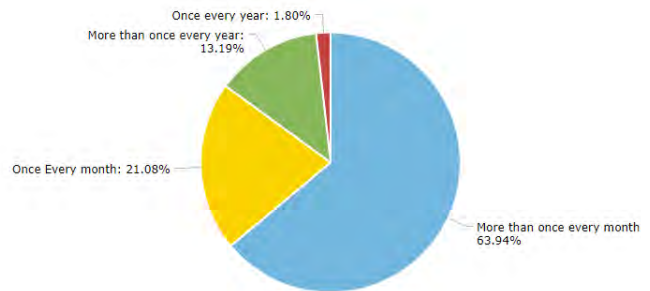
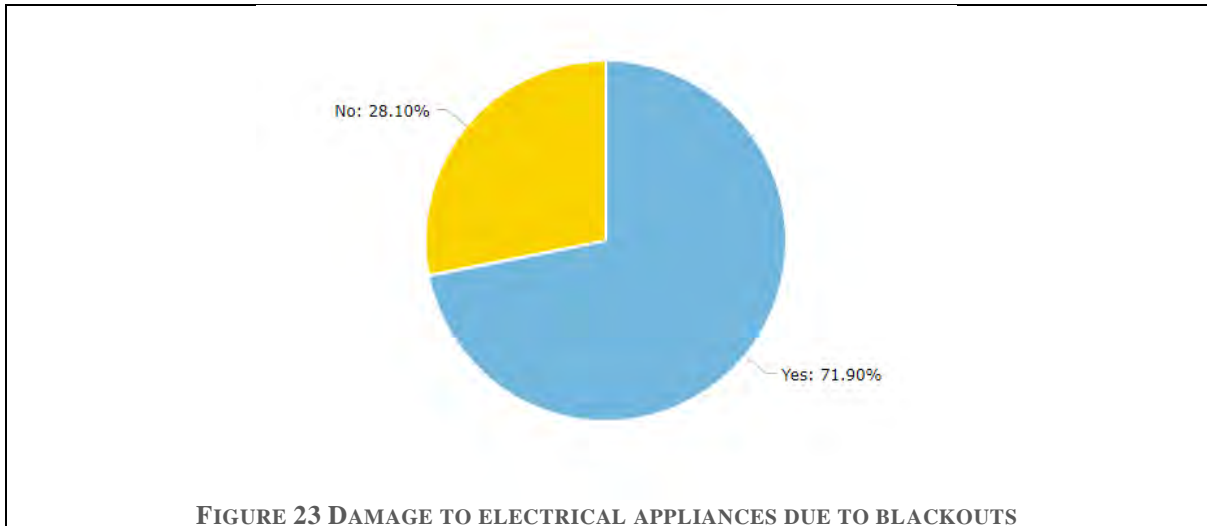


FIGURE 22 FREQUENCY OF BLACKOUTS



This section presents the results from questions 6 to 11 (Annex 1) of the survey. As seen on Figure 5 household lighting, fans, air conditioning, television, Computer, water heating and charging electronic devices are the main aspects to which electricity is used in the households of Addu. More than 70% of survey respondents use electricity for these purposes (Figure 5). In addition, more than 50% of the respondents use electricity for cooking (Figure 5). 81.60 % of the respondents believe that the existing price of electricity is too high (Figure 6). On average per head MVR 100 to MVR 600 is spent on electricity on a monthly basis (Figure 7). It is noticeable that those respondents that suggested to pay more than MVR 400 per unit head is more in Addu compared to other surveyed islands. This maybe reflecting a more affluent portion of the population who uses more electricity than other islands. However, the sample size is too small to make any inferences regarding this aspect. In terms of blackouts 71.90% of the survey respondents suggested that electricity goes more than once every month (Figure 8). 71.90% of survey respondents suggested that electrical appliances have been damaged due to blackouts. Multiple project interventions planned, through grid upgradation, BESS system and solar PV installation will likely reduce these negative impacts related to blackouts that the surveyed community perceived to be experiences.

5.4 Perception on the Project

This section presents the results from 12 to 20 of the survey. This section identifies public perception on the proposed project interventions.

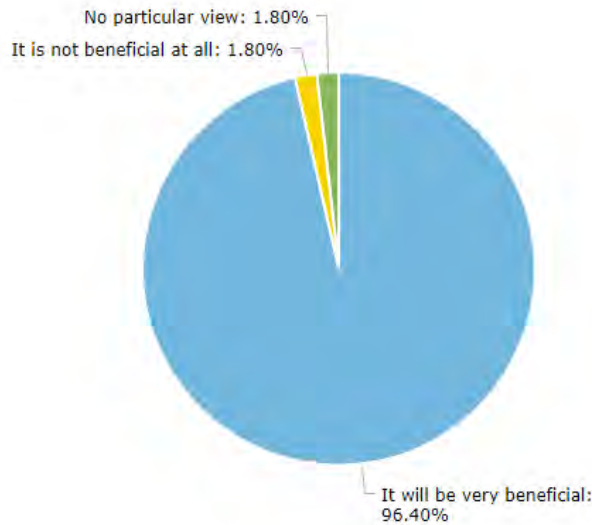


FIGURE 24 BENEFITS OF SOLAR PV

96.10% of those who were surveyed identified that the Solar PV installation undertaken through the project will be very beneficial (Figure 10). Only 1.80% of the respondents believe that the project will not be beneficial.

Based on the text analysis that was undertaken the primary benefit that the public identified as a result of PV installation is potential bill reductions and the inherent environmental benefits associated with Solar PV (Figure 11). As the word cloud analysis suggests that predominantly phrases like, “electricity bill”, “reduce electricity bill”, “reduction”, “environment” and “environmental friendly” were the phrases used by the majority of the survey respondents (Figure 11). Hence, the two key reasons that the public supports this project can be summarized as below:

1. Inherent environmental benefits of the project
2. Expectation that a good change will occur to cost of electricity

As electricity is provided by a huge fuel subsidy the aim of the government is to reduce this subsidy through projects like this with the long-term aim of reducing the price of electricity. An immediate change in price in electricity may not occur as a result of the project, thus through the various communications undertaken through the project this needs to be clearly highlighted. Moreover, education awareness programs can be undertaken to show the environmental benefits that occur as a result of the project.

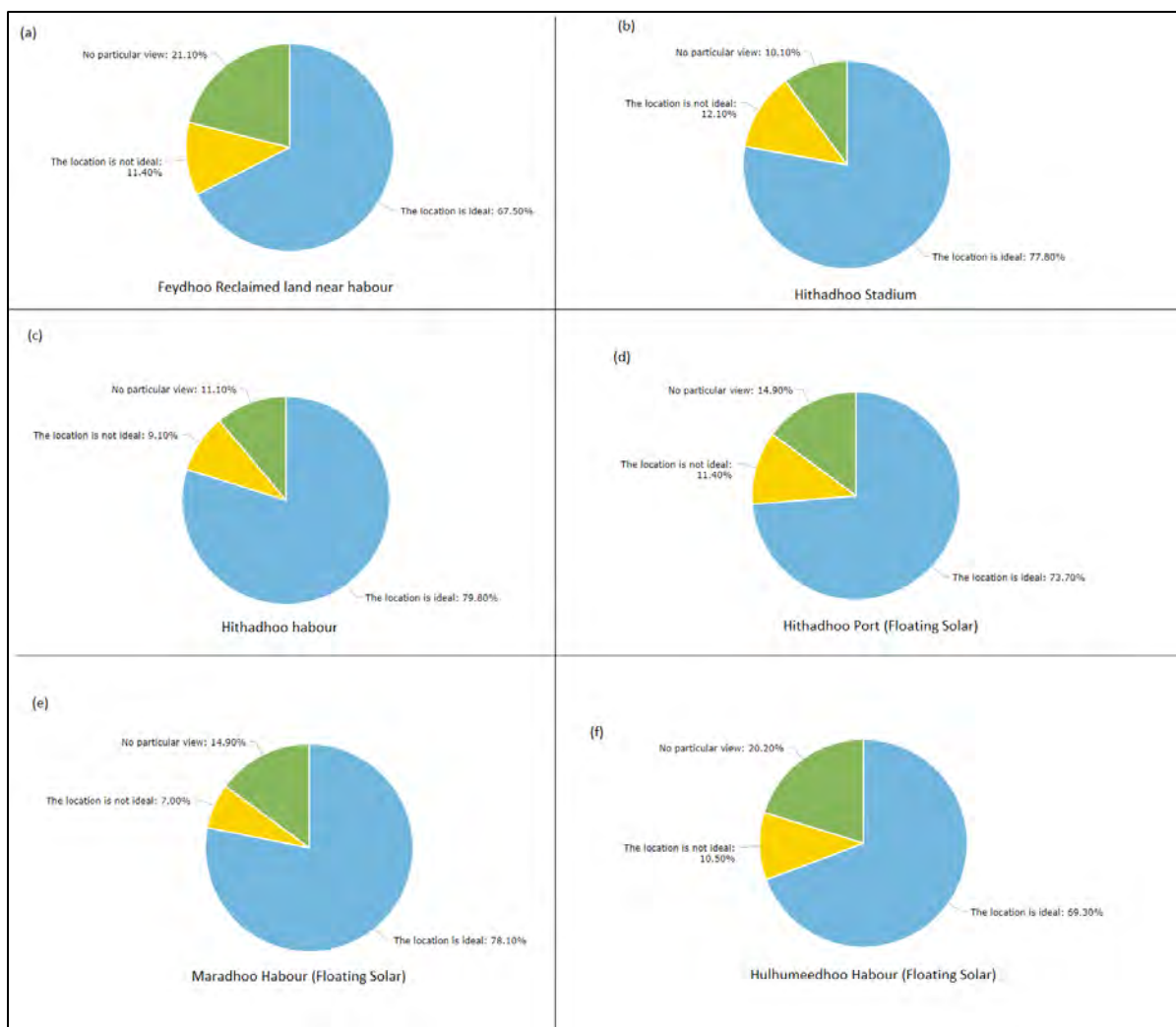


FIGURE 28 PERCEPTION REGARDING SOLAR PV INSTALLATION LOCATION

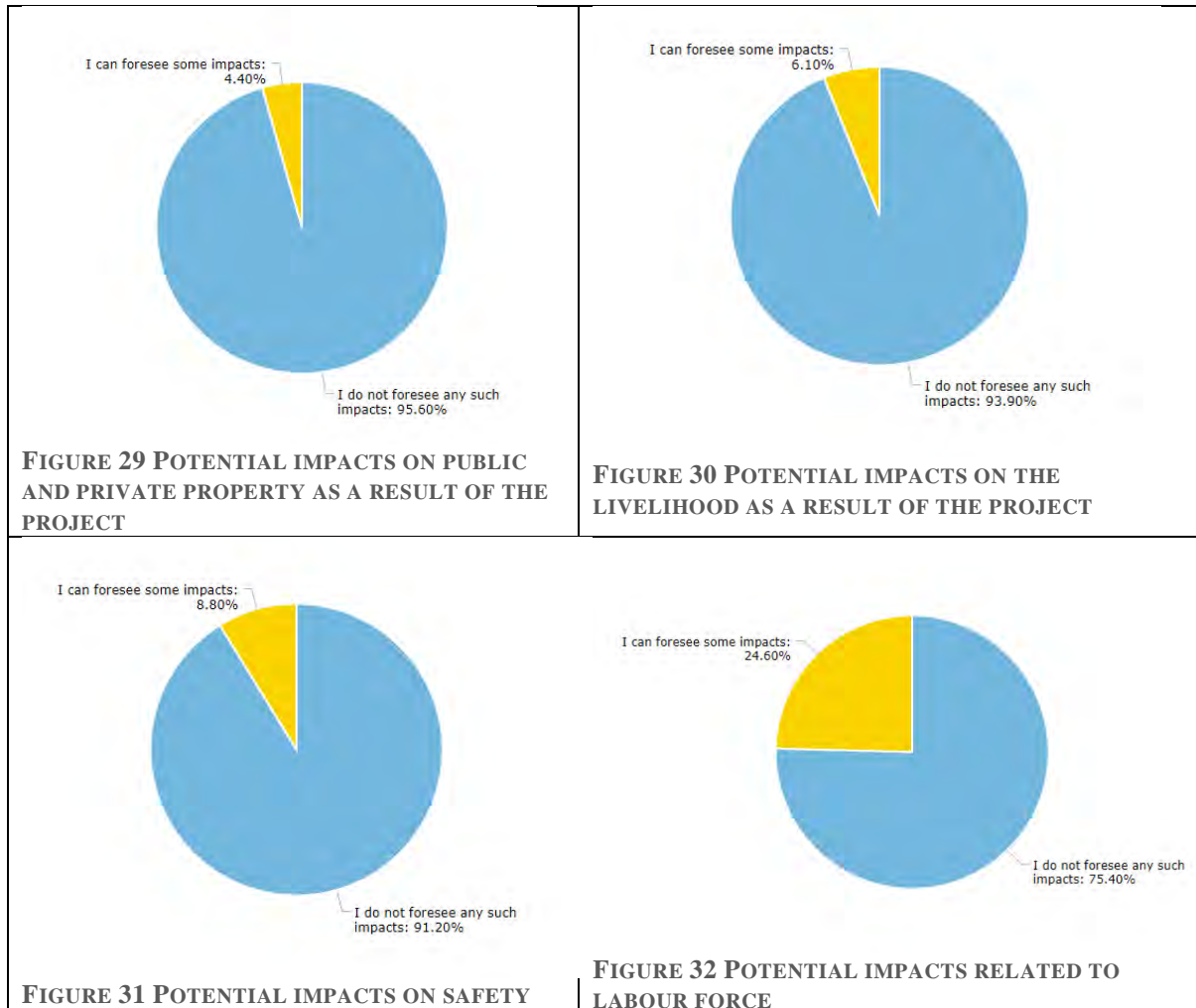
Issue Raised	Response to the concern
General Concern	
Three respondents highlighted that that they do not prefer land areas as land area in Addu is limited, they suggested that they prefer marine sites	These areas are selected such that the areas can be used for another purpose as well, council selected these locations taking into consideration land use.
One respondent highlighted that there are many protected areas in Addu and to install the panels in these locations	Protected areas were avoided to minimize environmental impacts on these locations and impacts on aesthetic aspects of these locations.
Two respondents highlighted that they are not happy that a location from maradhoo-feydhoo was not included in the selected sites	Sites were selected by the council based on space available from the different islands of Addu.
Two respondents highlighted that they are not happy with marine locations as it can lead to damage to reefs due to lack of sunlight	Feasibility study will be undertaken prior to installation which will look into environmental aspects as well. The locations are located away from the reef in the lagoon area. Previous installations in Maldives have suggested that floating solar PV sites become fish aggregation sites.

One respondent highlighted that there is huge roof on the newly constructed police academy buildings which could be used for this purpose	Discussions were held by the project with Maldives Police Service to attain these roofs, however due to contractual arrangements the police were not able to provide these roofs for the purpose of the project.
One respondent suggested to reclaim separate island to install solar PV	This will be counter productive for a mostly environmentally friendly project, as it can lead potentially to more damage than benefits.
Feydhoo Harbour Area	
Two respondents highlighted that this area was designated for industrial/commercial purpose	These areas are selected such that underneath the panels can be used to the desired purpose of the council. The council selected these locations taking into consideration land use.
One respondent highlighted that the area is too close to public areas hence may pose security/safety risks	<p>Security will be ensured by the investor.</p> <p>The transformer will be placed in an enclosed hut. Appropriate safety signs will be placed near transformers.</p> <p>During construction phase appropriate safety measures will be taken.</p> <p>The structures will take into consideration wind load and other civil requirements.</p>
One respondent that the area was reclaimed with significant costs, hence using for this purpose is not acceptable	The PV installations are such that underneath the panels can be utilized for the intended purpose of the council.
Hithadhoo Stadium	
One respondent highlighted that the area is too close to public areas hence may pose security/safety risks	<p>Security will be ensured by the investor.</p> <p>The transformer will be placed in an enclosed hut. Appropriate safety signs will be placed near transformers.</p> <p>During construction phase appropriate safety measures will be taken.</p> <p>The structures will take into consideration wind load and other civil requirements.</p>
One respondent highlighted that sufficient sunlight may not be available from this location and that the location may be used to another purpose in near future	<p>Location identified by city council taking into account future landuse. The area will be used for parking of vehicles that use the stadium.</p> <p>Assessments undertaken indicate required level of sunlight can be attained from the location.</p>
Hithadhoo Harbour Location	
One respondent highlighted that the area is too close to public areas hence may pose security/safety risks	<p>Security will be ensured by the investor.</p> <p>The transformer will be placed in an enclosed hut. Appropriate safety signs will be placed near transformers.</p>

	<p>During construction phase appropriate safety measures will be taken.</p> <p>The structures will take into consideration wind load and other civil requirements</p>
One respondent highlighted that sufficient sunlight may not be available from this location and that the location may be used to another purpose in near future	<p>Location identified by city council taking into account future landuse. Underneath will be used as shade by harbour users and for "Gaadiyaa" or cart food market, as per the council.</p> <p>Assessments undertaken indicate required level of sunlight can be attained from the location.</p>
Hithadhoo Port Area (Floating)	
One respondent highlighted that it will hinder port expansion	The area was selected by the council taking into consideration port expansion. As per the council port expansion will occur to the north of the existing harbour, while panel installations are to the south.
One respondent highlighted that Hithadhoo lagoon area is the only area where guesthouse tourism can be developed. So installing such a huge structure with obstruct the beautiful view and lose the locations attractiveness	<p>The selected location in the lagoon 400 meters away from the existing beach area and around 250 meters away from the beach following the proposed reclamation.</p> <p>Close to the location already there are industrial activities including port facility, powerhouse, Waste Management Facility, Police academy.</p> <p>As this is floating solar will be at sea level, hence view will not be disrupted.</p> <p>As floating if required to move can be moved.</p>
Hulhumeedhoo Harbour (Floating)	
Four respondents highlighted that the location is marked for future reclamaiton	<p>Floating panels will be placed outside the reclamation boundary. Exact location will be determined following feasibility study.</p> <p>As it is floating solar PV, if required it can be moved.</p>
One respondent highlighted that the marine ecosystem of the area will be negatively impacted.	<p>This will be investigated in detail during the feasibility assessment.</p> <p>Previous floating installations in Maldives suggest that these areas often act as fish aggregation sites.</p> <p>As the area contains seagrass, it is acknowledged that impacts can occur due to lack of light penetration at the immediate footprint. Feasibility will look into minimizing the impacts.</p>
Maradhoo Harbour (Floating)	
No specific issue identified by the public for this site)	

5.5 Perception on Environment and Social Impacts

This section looks into the perception of the public in relation to potential environmental and social impacts related to the project. It relates to question number 20 and 37 of the survey. Figures below present the outcomes of the survey.



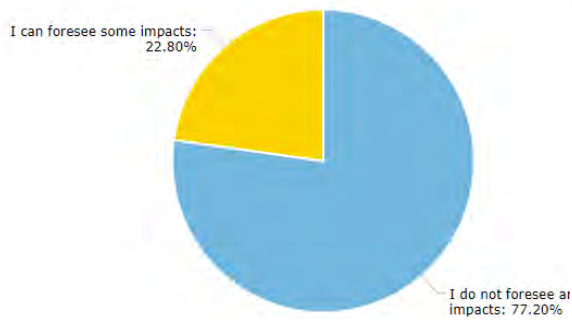


FIGURE 33 POTENTIAL IMPACTS RELATED TO VIBRATION, NOISE AND DUST

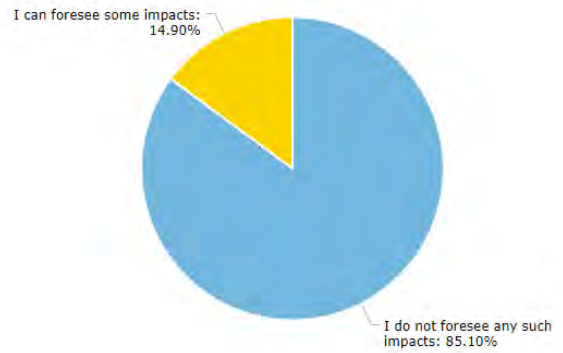


FIGURE 34 POTENTIAL IMPACTS ON TRAFFIC

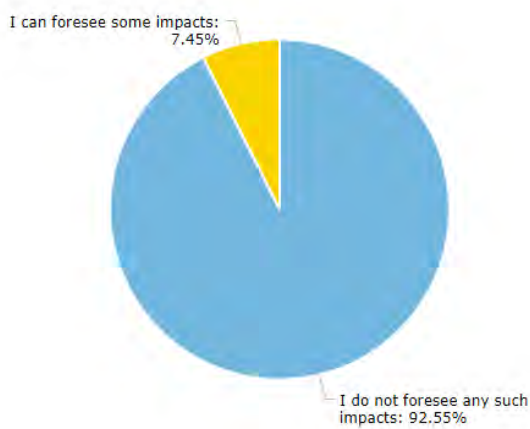


FIGURE 35 POTENTIAL IMPACTS ON VEGETATION

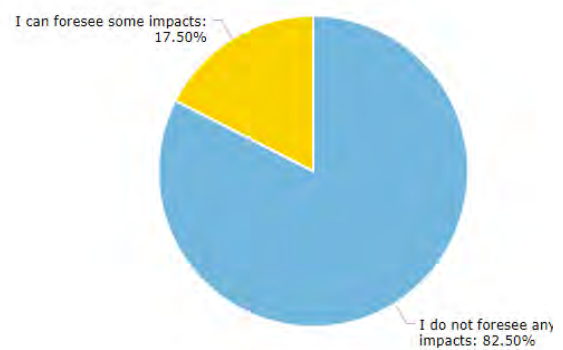


FIGURE 36 POTENTIAL IMPACTS ON GROUNDWATER

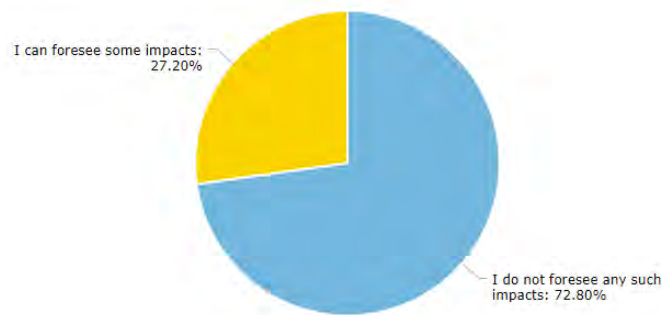


FIGURE 37 UNDERWATER IMPACTS DUE TO FLOATING SOLAR

As can be seen from the graphs the public do not foresee significant major negative impacts to arise as a result of this project. Of the few that raised concerns the table below summarizes the issues raised by the survey respondents for each of the impacts surveyed.

Aspect	Raised Issue or Concern
Impacts on property	➤ One respondent highlighted damage to roof and whole structure of houses.
Impacts on livelihood	➤ Three respondents highlighted that Fenaka may reduce jobs
Impacts on Safety	➤ Vandalism issue was raised by one respondent.
Impacts of labour Force	<ul style="list-style-type: none"> ➤ Ten respondents raised the importance of using local labor for project activities rather than foreign labor ➤ Conflicts of foreign labor with local community was raised by four respondents. ➤ Lack of pay for labor force creating issues were raised by three respondents
Impacts on noise, vibration and dust	<ul style="list-style-type: none"> ➤ Four respondents highlighted disturbances can occur without specifics ➤ One respondent highlighted based on work methodology disturbances can occur during floating solar installation.
Impacts on traffic	➤ Two respondents highlighted as it's a construction project some disruptions are expected to occur.
Impacts on vegetation	<ul style="list-style-type: none"> ➤ One respondent highlighted that the option to relocate should be first considered. ➤ One respondent highlighted not to cut any trees as part of the project. ➤ One respondent highlighted that the proposed stadium area is a location where people go to hangout and take pictures so cutting any trees from this location is not ideal.
Impacts on groundwater	➤ One respondent highlighted that when the roads were dug for the sewerage project it caused groundwater salinization.
Impacts underwater	<ul style="list-style-type: none"> ➤ Five respondents highlighted that the blocking of sunlight will impact the corals and seagrass beds underneath the floating platforms. ➤ One respondent highlighted that the anchoring areas for floating solar may impact the marine life. ➤ Three respondents highlighted that in general marine life including fish can be impacted. It was highlighted that especially the lagoon of Hulhumeedhoo is rich in biodiversity.

When preparing the required environmental and social assessments for various components of the project these aspects need to be investigated and appropriate mitigation measures identified. Some preliminary mitigation measures are identified in the table below:

Impacts	Responses and Mitigation Measres
Damage to buildings and structures due to construction works	<ul style="list-style-type: none"> ➤ If piling works are undertaken it will be undertaken with necessary safeguards. ➤ Excavation close to buildings and structures will be undertaken with appropriate shoring to minimize damage to foundation.

	<ul style="list-style-type: none"> ➤ Digging close to the foundation of households will be avoided as much as possible.
Loss of job and revenue as a result of the project	<ul style="list-style-type: none"> ➤ Loss of any existing jobs or revenues as a result of the project will not occur.
Involvement of locals in the labour force	<ul style="list-style-type: none"> ➤ Local staff of Fenaka will be involved in operation and maintenance of Battery Energy Storage System (BESS) ➤ Exposure visits and awareness campaigns undertaken for locals. ➤ Local staff from Fenaka will be involved in Environmental and Social inspection during construction and operation phase. ➤ Investors that install solar PV will be encouraged to utilize local staff during operation and maintenance phase
Conflicts with local community	<ul style="list-style-type: none"> ➤ The workers will need to be briefed on local customs and traditions using the language of the construction work force.
Lack of pay, inadequate accommodation and ill treatment of labor force	<ul style="list-style-type: none"> ➤ A Grievance Redress Mechanism will need to be implemented by investor for the labor force.
Traffic impacts	<ul style="list-style-type: none"> ➤ Where the road needs to be closed the following mitigation measures will be observed: <ul style="list-style-type: none"> ✓ Road closures will be coordinated with police and the council. ✓ Appropriate safety signs will be installed. ✓ Aim to finish construction works as per the schedule.
Vegetation impacts	<ul style="list-style-type: none"> ➤ As a first option, the option to relocate any vegetation found in the location will need to be considered. Vegetation needs to be removed only if this is not possible. ➤ For each tree/palm removed two trees/palms need to be planted at a location identified by the council.
Groundwater contamination (dewatering impacts)	<ul style="list-style-type: none"> ➤ If dewatering is required dewatering permit needs to be attained and works need to be completed within the shortest possible time. ➤ Through the regulation, the option to recharge groundwater should be considered first before discharging out into the sea.
Underwater impacts	<ul style="list-style-type: none"> ➤ The floating solar PV will be located based on feasible study, which takes into consideration environmental aspects as well. ➤ Areas where there are seagrass and coral patches within the lagoon will be avoided as much as possible.

5.6 Conclusion

Based on the survey results, overall it can be seen that the public of Addu are very keen and positive regarding the project. With 96.4% of the surveyed public suggesting that Solar PV installation is beneficial and 94.7% of survey respondents suggesting that grid upgradation will be beneficial. For solar PV component, the text analysis done identified inherent environmental benefits and expectation for reduction in cost of electricity as the main benefits. As for grid upgradation the main benefits identified by the public was associated with resolution of frequent blackouts and other issues associated with providing reliable electricity.

In terms of location, all the selected locations had an approval rating above 65% of the survey respondents. In terms of comments received, some were not happy that land areas are utilized for the project, while others were not happy that marine areas were used for the purpose of the project, few were not happy that panels were not located in their island and some suggested in their view better alternative locations. However, in general the respondents were positive regarding the project and the locations with very few raising specific concerns. All selected locations, except maradhoo harbour floating site received some comments. In terms of impacts, not much were highlighted by the public and all impacts highlighted could be appropriately managed by appropriate mitigation measures.

5.7 Translated google form

Translation of Google Form

Introduction and Background

This Google form is to attain public views regarding the Solar PV Installation, Grid Upgradation and Battery Installation at (island name) through Accelerating Renewable Energy Integration and Sustainable Energy (ARISE) Project. ARISE project is funded by World Bank and implemented by Ministry of Environment.

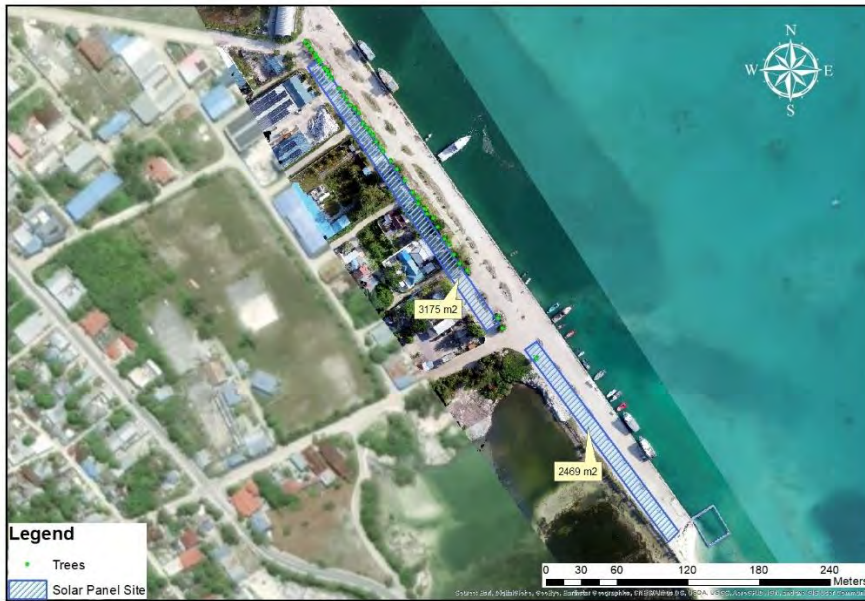
Disclaimer: The views and information provided in this survey will be kept confidential. Only compiled information will be used for data analysis.

Locations of Solar PV Installation at (Addu)

(a) Hithadhoo Stadium



(b) Hithadhoo Harbour



(c) Feydhoo Harbour



(d) Hithadhoo Port



(e) Maradhoo harbour



(f) Hulhumeedhoo Harbour



3D Visual of the location at which solar PV is installed (Addu)

Brief description of the construction activities that will be undertaken under each of the activities planned:

1. Solar PV Installation: Solar panel will be installed on ground mounted structures; the footing will be made of concrete. The work area will be closed off and proper demarcations will be placed during the construction phase. Construction is likely to take around 06 months.
2. Grid Upgradation: Grid Upgradation will involve cable laying on roads as the main component. Moreover, transformers will also need to be placed in certain location. Roads may need to be closed through council approval for a period of time, only roads where works are undertaken will be closed and appropriate traffic management will be undertaken by talking to police and council. Transformers will be placed in locations that are fenced out and protected with relevant safety signs so as to protect the public. It is not envisioned that private property will need to be used for this purpose. This work is likely to take a maximum of three months.
3. Battery Energy Storage System: This system will be most ideally placed within the powerhouse footprint, even if outside (depending on space) it will be placed in a designated location which will be enclosed with proper safety signage. Installation is likely to be completed within a month.

Part 1: General Information

1. Gender
 - (a) Male
 - (b) Female

2. Age
 - (a) 18 and 25 years
 - (b) 25 to 35 years
 - (c) 35 to 45 years
 - (d) 45 to 55 years
 - (e) Above 55

- 3. Marital Status
 - (a) Married
 - (b) Single
 - (c) Divorced
- 4. Number of Children

.....

- 5. Employment Status
 - (a) Government job
 - (b) Private Sector job
 - (c) Own Business
 - (d) Unemployed
- 6. Number of persons in the household

.....

Part 2: Electricity Usage and Reliability

- 7. Electricity is used in your household to which of the following activities (please choose all activities to which you use the electricity)
 - (a) Household Lighting and fans
 - (b) Air conditioning
 - (c) Television
 - (d) Computer
 - (e) Radio
 - (f) Water Heating
 - (g) Cooking
 - (h) Homebased livelihood activities
- 8. Average monthly expenditure spent on electricity at household
.....
- 9. What is your view on the electricity expenditure per month?
 - (a) It is reasonable
 - (b) It is too high
- 10. Usually blackouts happen in the household
 - (a) Once Every month
 - (b) More than once every month
 - (c) Once every year
 - (d) More than once every year
 - (e) Blackouts don't happen
- 11. Have any electrical appliances been negatively impacted as a result of blackouts
 - (a) Yes
 - (b) No

Part 3: Perceptions on the Project

- 12. What is your view on the solar PV installation in your island
 - (a) It will be very beneficial
 - (b) It is not beneficial at all

(c) I have no particular view on this

13. If you answered that it is very beneficial in question 10, then please briefly identify the reason for this
.....

14. If you answered that it is not beneficial in question 10 please briefly identify the reason for this
.....

15. What is your view on the Grid Upgradation in your island
(a) It will be very beneficial
(b) It is not beneficial
(c) I have no particular view on this

16. If you answered that it is very beneficial in question 15 the please briefly identify the reason for this
.....

17. If you answered that it is not beneficial in question 15 please briefly identify the reason for this
.....

18. What is your view on the location in which the PV panels are proposed to be installed
(a) The location is ideal
(b) The location is not ideal
(c) I have no particular view on this

19. If you answered the location is not ideal in question16 briefly state the reason for this
.....
.....

20. Do you foresee any property damages that may occur as a result of this project? negative s
(a) I do not foresee any such impacts
(b) I can foresee some impacts

21. If you answered I can foresee some impacts in question 20 could you briefly describe the impacts
.....
.....
.....

22. Do you foresee that the project may negatively impact your livelihood?
(a) I do not foresee any such impacts
(b) I can foresee some impacts

23. If you answered I can foresee some impacts in question 22 could you briefly describe the impacts
.....
.....
.....

24. Do you foresee any negative safety issues that may arise as a result of this project?

- (a) I do not foresee any such impacts
- (b) I can foresee some impacts

25. If you answered I can foresee some impacts in question 24 could you briefly describe the impacts

.....
.....
.....

26. Do you foresee any negative impacts related to labor force that may occur as a result of the project?

- (a) I do not foresee any such impacts
- (b) I can foresee some impacts

27. If you answered I can foresee some impacts in question 26 could you briefly describe the impacts

.....
.....
.....

28. Do you foresee any negative impacts related to dust, noise or vibration that may occur as a result of the project?

- (a) I do not foresee any such impacts
- (b) I can foresee some impacts

29. If you answered I can foresee some impacts in question 28 could you briefly describe the impacts

.....
.....
.....

30. Do you foresee any negative traffic impacts that may occur as a result of the project?

- (a) I do not foresee any such impacts
- (b) I can foresee some impacts

31. If you answered I can foresee some impacts in question 30 could you briefly describe the impact

.....
.....
.....

32. Do you foresee any negative impacts on vegetation that may occur as a result of this project?

- (a) I do not foresee any such impacts
- (b) I can foresee some impacts

33. If you answered I can foresee some impacts in question 32 could you briefly describe the impact

.....
.....
.....

34. Could you foresee any negative impacts on ground water that may arise as a result of this project?

- (a) I do not foresee any such impacts
- (b) I can foresee some impacts

35. If you answered I can foresee some impacts in question 34 could you briefly describe the impact

.....
.....
.....

36. Do you foresee any impacts on the marine environment as a result of floating solar PV?

(a) I do not foresee any such impacts

(b) I can foresee some impacts

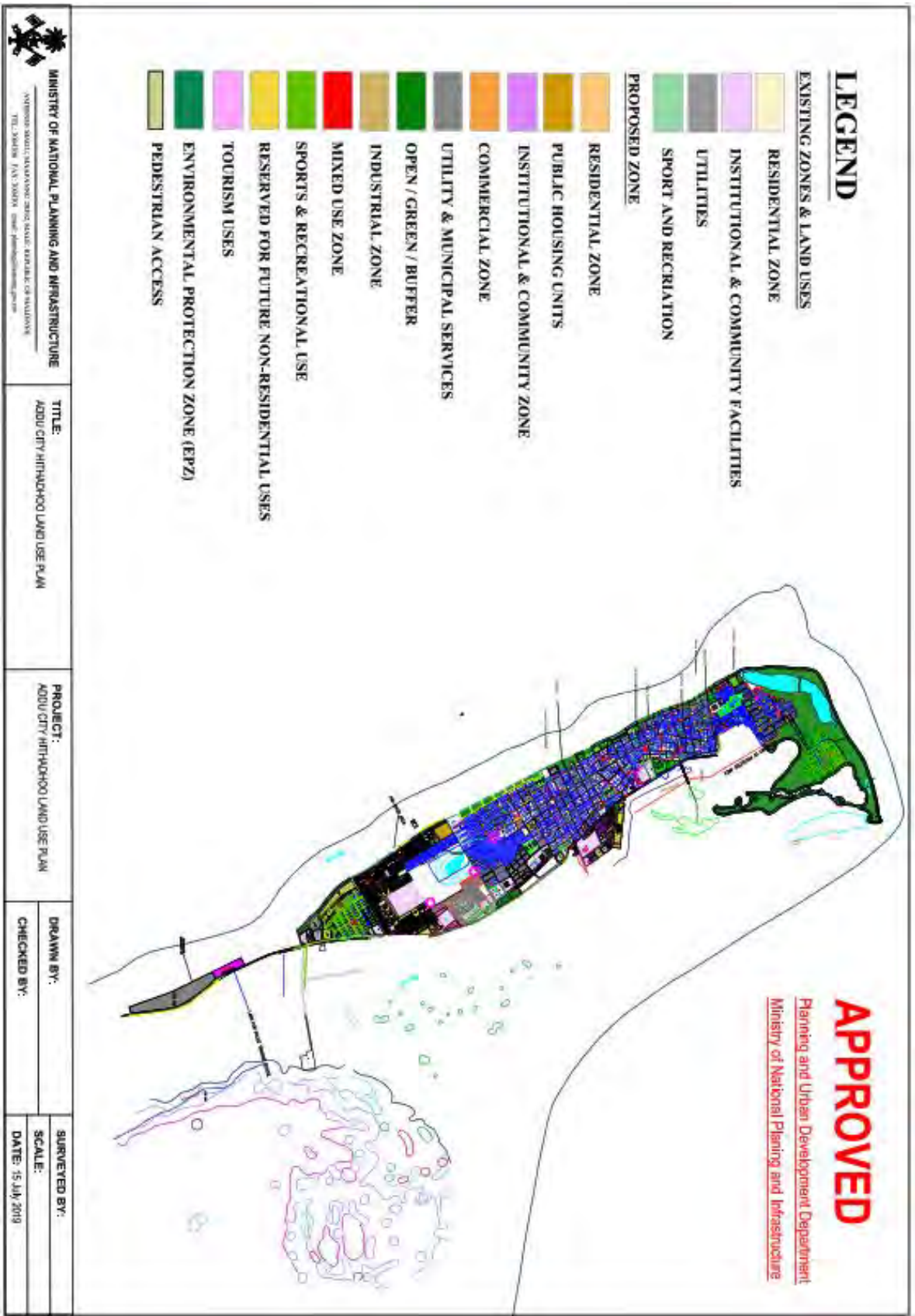
37. If you answered I can foresee some impacts in question 36 could you briefly describe the impact

.....
.....
.....

38. If you could foresee any other negative impacts as a result of this project please describe briefly below

.....
.....
.....

6 Annex 5: Landuse Plans



APPROVED

Planning and Urban Development Department
 Ministry of National Planning and Infrastructure

LEGEND

EXISTING ZONES & LAND USES

RESIDENTIAL ZONE

INSTITUTIONAL & COMMUNITY FACILITIES

UTILITIES

SPORT AND RECREATION

PROPOSED ZONE

RESIDENTIAL ZONE

PUBLIC HOUSING UNITS

INSTITUTIONAL & COMMUNITY ZONE

COMMERCIAL ZONE

UTILITY & MUNICIPAL SERVICES

OPEN / GREEN / BUFFER

INDUSTRIAL ZONE

MIXED USE ZONE

SPORTS & RECREATIONAL USE

RESERVED FOR FUTURE NON-RESIDENTIAL USES

TOURISM USES

ENVIRONMENTAL PROTECTION ZONE (EPZ)



 MINISTRY OF NATIONAL PLANNING AND INFRASTRUCTURE <small>AMBULATHU, MALDIVIAN ZONE, MALE' ADDU CITY MALDIVES TELEPHONE: 96033220001, 96033220002, 96033220003</small>	TITLE	PROJECT	DRAWN BY	SURVEYED BY
	ADDU CITY HULHUMEDHOO LAND USE PLAN	ADDU CITY HULHUMEDHOO LAND USE PLAN	CHECKED BY	

7 Annex 6: Land Approval Letter Translations

[Unofficial Translation]

Secretariat of Addu City Council

Addu,

Republic of Maldives.

Reference No: 426-AA/438/2020/9

To: Minister of Environment Dr. Hussain Rasheed Hassan

With reference to Ministry's letter No. 438-ASPIRE/426/2020/18

Attached with this letter please find the map showing the land areas allocated for solar photovoltaic installation, as requested under Accelerating Renewable Energy Integration and Sustainable Energy (ARISE) Project, in Hithadhoo, Maradhoo and Feydhoo of Addu City, with the exception of the land areas allocated for Hulhudhoo-Meedhoo ward. We will share the map of the Hulhudhoo-Meedhoo ward once finalized.

Therefore, please note that we have no objection to carrying out the works of installing of solar PV in the areas marked in the map attached herewith.

With Respect,

04 Safar 1442

21 September 2020

Sincerely,

[Signature & Seal]

Abdullah Sadiq

Mayor

Ministry of Environment

Male' Republic of Maldives

The forgoing is a true and accurate translation of its original.

Attested by: *Hassan Shiyam Mohamed*

Legal Specialist

Accelerating Sustainable Private Investment in Renewable Energy (ASPIRE) Project

Ministry of Environment



Ministry of Environment,

Male'

Republic of Maldives

Reference No. 438-ASPIRE/471/2020/101

To: Minister of National Planning, Housing and Infrastructure Mohamed Aslam,

REG: Installation of Solar PV Systems in Addu City under Accelerating Renewable Energy Integration and Sustainable Energy (ARISE) Project

The Project referenced above is implemented by this Ministry with the aid of the World Bank and other financiers, with the objective of reducing Maldives' dependency on fossil fuel, decreasing fuel expenditure and to develop the country's power sector in a sustainable manner. For the first phase of the Project, this Ministry is in the process of carrying out the works necessary for the installation of 21 MW of Solar PV in 06 administrative areas. This project is formulated in such a way that private investors are required to develop the system and sell electricity produced from it, at a low rate under a 15 year Power Purchasing Agreement. The Investor is responsible for the operation and maintenance of the system for the duration of the Project.

And an agreement will be signed with the site owners to lease out the land area or issue a license to use the land area selected for the purpose of installing solar PV. This Project is an important project in paving the way for increasing the renewable energy capacity by 20% by the end 2023 from the capacity levels of 2018, as per the target 2.1 of the governments Strategic Action Plan. Further due this Project the fuel subsidy the government is paying will be reduced and this will benefit both the government and the citizens.

As part of the first phase of this Project, 13 MW of the 21 MW of solar PV to be installed, will be installed in various areas in Addu City. Out of which 03 MW of solar PV will be ground mounted and 10 MW will be floating solar installed on selected lagoons. The areas allocated for this project was selected after consultation with Addu City council over the past year. Solar PV will be installed in these land areas without impeding the use for which these land areas has been allocated for under the respective land use plans. And such land use will be stated in bidding document and a condition will be included during the bidding stage, so that the design of installation will not impede the use for which the land has been allocated for. We have conducted a survey, with the aid of Addu City Council to gather public opinion on this Project, and from the 115 personnel who participated in this survey an overwhelming 96.4% of the participants responded favorably towards this Project.

Therefore, as the Ministry responsible for land use approval process, please share with us if you have any objections to the land areas issued by the Addu City Council to install solar PV under this Project, being used for such purpose. Attached herewith please find, for your information, the approvals issued by the Council for the allocated areas, the Memorandum of Understanding signed with the Council for cooperation in implementing the Project and the concept drawings done for the areas selected. And please note that the detailed designs will be made by the winning bidder in accordance with the project guidelines and will be done so in such a way that it does not impede the intended use for which the selected land has been allocated.



With Respect,
09 Safar 1442,
27 September 2020

Sincerely,
[Signature]
Ajwad Musthafa
Permanent Secretary

Ministry of National Planning, Housing and Infrastructure
Male'
Republic of Maldives
Copy: Secretary of Addu City Council
Addu City, Republic of Maldives,

The forgoing is a true and accurate translation of its original.

Attested by: Hassan Shiyam Mohamed

Legal Specialist

*Accelerating Sustainable Private Investment in Renewable Energy (ASPIRE) Project
Ministry of Environment*



Ministry of National Planning, Housing and Infrastructure
Male', republic of Maldives

Reference No.:471-DNPS2/438/2020/43

To: Minister of Environment Dr. Hussain Rasheed Hassan,

With reference to your Ministry's letter No. 438-ASPIRE/471/2020/101 dated 27th September 2020, please note the following;

From among the sites suggested for installation of solar PV under Accelerating Renewable Energy Integration and Sustainable Energy (ARISE) Project, this Ministry has no objection to the sites located in areas near Addu City Hithadhoo Stadium, Maradhoo Harbor area allocated for floating solar and the area allocated at Hithadhoo for floating solar, to be used for the purpose.

As for the Harbor area in Hithadhoo allocated for solar PV installation, please note that since this is regarded as the most important point of loading and unloading of goods and passengers, the width of the road next to the harbor in an island such as Hithadhoo, should preferably be 12 meters wide. At minimum 10 meters of width should be there between the harbor and the road. Therefore, please allocate the land for solar PV installation near the harbor area after leaving space for a 10 meter wide road between the harbor and such installation.

In addition, with regard to the land area allocated for solar installation next to Feydhoo harbor please note that, under the land use planning regulation, when planning services in the harbor areas, priority has to be given to public needs that the general public can access with ease. As such the areas will be planned with space being left for ferry terminals, fuel and other storage facilities, fish markets, and other businesses. Therefore, instead of allocating land immediately next to the harbor in Addu City Feydhoo Harbor, please allocate land from another area of the island for the purpose.

With Respect,
27 Safar 1442,
14 October 2020,

This is a true and accurate translation of its original.

Attested by: Hassan Shiyam Mohamed

Legal Specialist

*Accelerating Sustainable Private Investment in Renewable Energy (ASPIRE)
Project*

Ministry of Environment



Sincerely,

[Signature]

Fathimath Shaheen,

Director, Regional Development

Ministry of Environment

Male', Republic of Maldives

Secretariat of Addu City Council

Addu,

Republic of Maldives.

Reference No: 426-AA/438/2020/17

To: Minister of Environment Dr. Hussain Rasheed Hassan

Attached with this letter please find the map showing the land areas allocated for solar photovoltaic installation, under Accelerating Renewable Energy Integration and Sustainable Energy (ARISE) Project, in Hulhumeedhoo and Feydhoo of Addu City.

In installing solar PV in Feydhoo please ensure shading is made available to the public who use the area and in Hulhumeedhoo please ensure that the area can be used as parking lot.

Therefore, please note that we have no objection to carrying out the works of installing of solar PV in the areas marked in the map attached herewith.

With Respect,

08 Rabeeu Al Aakhir 1442

23 November 2020

Sincerely,

[Signature & Seal]

Abdullah Sadiq

Mayor

Ministry of Environment

Male' Republic of Maldives

The foregoing is a true and accurate translation of its original.

Attested by: Hassan Shiyam Mohamed

Legal Specialist

Accelerating Sustainable Private Investment in Renewable Energy (ASPIRE) Project

Ministry of Environment



Ministry of Environment,
Male'
Republic of Maldives

Reference No. 438-ASPIRE/471/2020/121

To: Minister of National Planning, Housing and Infrastructure Mohamed Aslam,

REG: Installation of Solar PV Systems in Addu City under Accelerating Renewable Energy Integration and Sustainable Energy (ARISE) Project

With reference to this Ministry's letter No. 438-ASPIRE/471/2020/121, dated 27th September 2020 and your Ministry's letter No. 471-DNPS2/438/2020/43 dated 14th October 2020, please note;

In the letter from your Ministry referenced above, your Ministry had indicated that the land area allocated for solar PV installation being close to Addu City Feydho harbor be moved to another area in the Island. As requested Addu Council has moved the area further away from the harbor and has informed this Ministry as such in writing. And the council has allocated a 01 hectore area form Addu City Meedhoo for solar PV installation and has informed this Ministry as such in writing as well.

Therefore, as the Ministry responsible for land use, please share with us if you have any objections to the revised land areas issued by the Addu City Council in Feydhoo to install solar PV under this Project, and to the area allocated from Addu City Meedhoo. And please find attached with this letter the approval issued by the Council.

With Respect,

11 Rabeeu Al Aakhir
1442

26 November 2020

This is a true and accurate translation of its original.

Attested by: Hassan Shiyam Mahamed

Legal Specialist

*Accelerating Sustainable Private Investment in Renewable Energy (ASPIRE)
Project*

Ministry of Environment



Sincerely,

[Signature]

Ajwad Musthafa

Permanent Secretary

Ministry of National Planning, Housing and Infrastructure

Male', Republic of Maldives

Copy: Secretary of Addu City Council

Addu City, Republic of Maldives,

Unofficial Translation

Secretariat of Addu City Council

Addu City,

Republic of Maldives.

Reference No: 426-AA/438/2021/1

To: Minister of Environment Dr. Hussain Rasheed Hassan

With Regards,

With reference to Ministry's letter No. 438-ASPIRE/426/2020/18

It is noted that the land area allocated for solar photovoltaic installation under Accelerating Renewable Energy Integration and Sustainable Energy (ARISE) Project, in Hulhudhoo ward of Addu City, is an area rich in palm trees. While 500 (Five Hundred) palm trees are to be removed from the area, the cost of tree amounts to MVR 400 (Four Hundred Rufiyaa). As this is not part of the scope of the Project, this cost is not included in the budget. Therefore, this land has been replaced.

Please find in the map attached herewith, the new 7200 square meters (60 x 120) land allocated for the development of the project in Hulhudhoo ward.

With Respect,

20 Jumaadhul Ula 1442

04 January 2021



Sincerely,

[Signature & Seal]

Abdullah Sodiq

Mayor

Ministry of Environment

Male' Republic of Maldives

Ministry of National Planning, Housing and Infrastructure
Male', republic of Maldives

Reference No.:471-DNPS2/438/2020/53

To: Minister of Environment Dr. Hussain Rasheed Hassan,

With Regards,

With reference to this Ministry's letter No. 471-DNPS2/438/2020/43 dated 14th October 2020 and your Ministry's letter No. 438-ASPIRE/471/2020/121 dated 26th November 2020, please note;

This Ministry has no objection to using the land allocated from Addu City Meedhoo for installation of solar PV under Accelerating Renewable Energy Integration and Sustainable Energy (ARISE) Project.

And this Ministry has no objection to the installation of solar PV in the area allocated for the purpose from Addu City Feydhoo, after leaving 4 meters of space from the shore protection in that area.

With Respect,

17 Rabeeu Al Aakhir 1442

02 December 2020

Sincerely,

[Signature]

Fathimath Shaheen,

Director, Regional Development

Ministry of Environment

Male', Republic of Maldives

The forgoing is a true and accurate translation of its original.

Attested by: Hassan Shiyam Mohamed

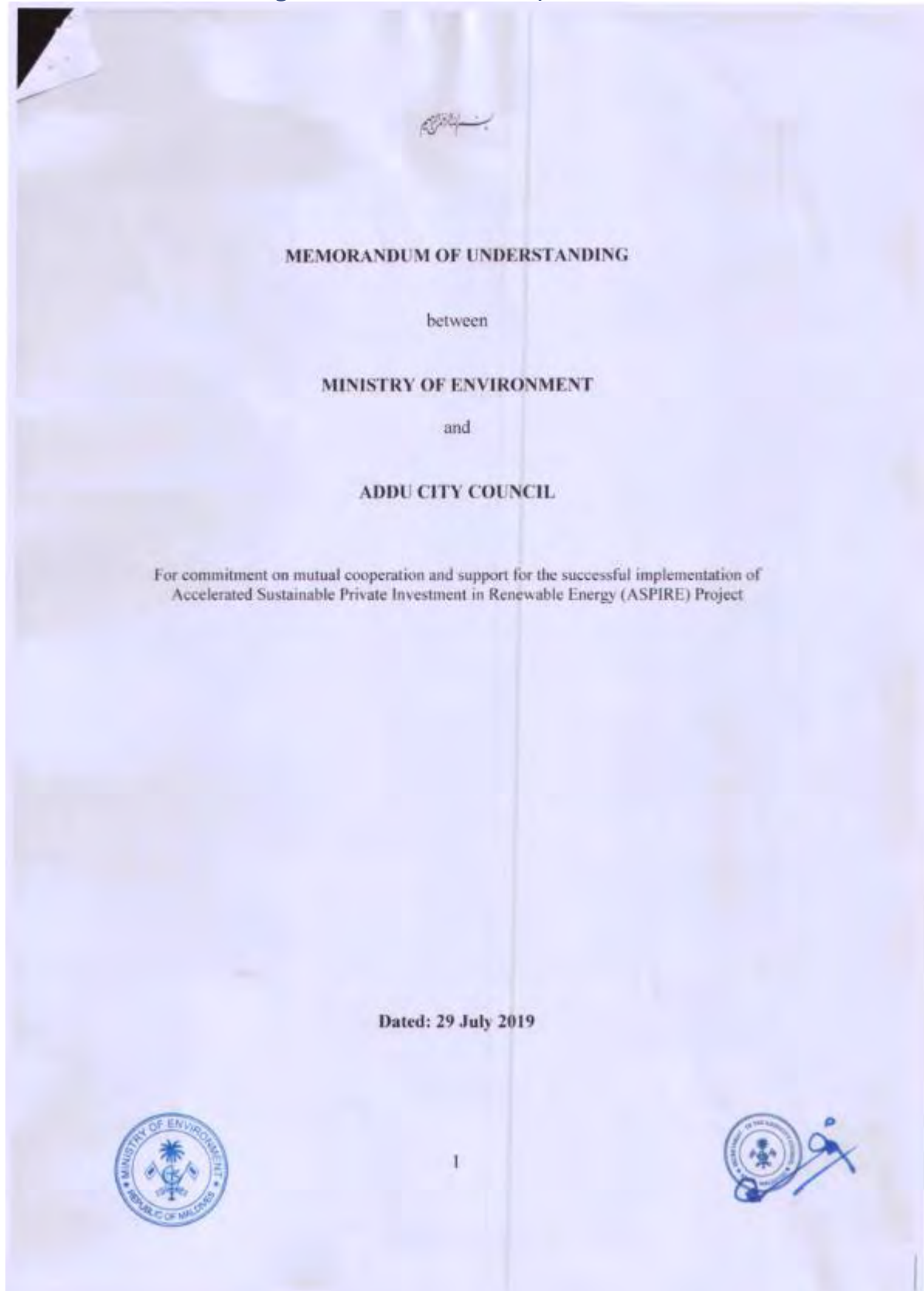
Legal Specialist

Accelerating Sustainable Private Investment in Renewable Energy (ASPIRE) Project

Ministry of Environment



8 Annex 7: MOU signed with Addu City Council



THIS MEMORANDUM OF UNDERSTANDING (the "MoU") is made on the 29th of July 2019

BETWEEN:

MINISTRY OF ENVIRONMENT of the Government of Republic of Maldives, having its office at Green Building, Handuvaree Hingun, Maafannu, Male', 20392 in the Republic of Maldives (hereinafter referred to as "**ME**").

And:

ADDU CITY COUNCIL of the Government of Republic of Maldives, having its office at Medheari Maggu, Addu City, Republic of Maldives (hereinafter referred to as the "**Council**").

(Collectively hereafter referred as "**Parties**")

WHEREAS:

- A. ME is desirous of executing a Memorandum of Understanding for commitment on mutual cooperation and support between Government Agencies, State Owned Enterprises and such other stakeholders necessary for the successful execution of Project(s) (as defined hereunder) carried out by or in connection with ME on behalf of the Government of Maldives (GoM), for the successful implementation of National Government Policies related to Energy; and
- B. GoM, represented by ME with the support of STRATEGIC CLIMATE FUND and the INTERNATIONAL DEVELOPMENT ASSOCIATION (IDA) has initiated a project in the Maldives titled Accelerating Sustainable Private Investment in Renewable Energy (herein referred to as "the Project" or ASPIRE), whereby private investors are invited to develop solar Photovoltaic (PV) systems on identified Site(s); and
- C. For the implementation of the Project, ME and the Council has mutually identified the Site(s) to develop solar PV system in accordance with Project Framework Documents (as defined hereunder);
- D. ME and the Council desire to execute this MoU for mutual support and cooperation in the successful implementation of the Project.

NOW THEREFORE, the Parties agree as follows;

1. Unless the context otherwise requires, in this MoU the following terms shall carry the meanings as set forth below:
 - 1.1 "Applicable Law" means any and all local policies, statutes, laws, regulations, ordinances, rules, rulings, judgements, orders, decrees, Authorizations, licenses or other governmental requirements or restrictions or any interpretation or administration of any of the forgoing, in effect at the time of entering into this MoU or shall come in to force in the future, in the jurisdiction of Republic of Maldives.
 - 1.2 "Authorizations" means permits, approvals or licenses required for the execution of the Project(s).
 - 1.3 "Donor" means International Development Association of World Bank.



- 1.4 "GoM" means Government of Maldives constituted under the Constitution of Maldives and shall include all the ministries, departments, authorities, agencies and persons thereto.
- 1.5 "Government Agencies" means Ministry of Environment, Maldives Energy Authority, other government ministries, departments, State Owned Enterprises, statutory bodies and regulatory bodies with any jurisdiction over the implementation of the Project(s) and involved in the provision of Energy, and protection of the Environment under Applicable Law in the territory of the Republic of Maldives.
- 1.6 "GRM" means the Grievance Redress Mechanism prepared as may be agreed between the Parties for the purpose of resolving social issues or grievances arising out of or in connection with the Project Framework Documents.
- 1.7 "Investor(s)" means local and international private parties procured by GOM through ME or Ministry of Finance, to execute the Project.
- 1.8 "ME" means Ministry of Environment and shall include the Maldives Energy Authority administered under ME and other departments, authorities, agencies, representatives and persons thereto.
- 1.9 "Project" means ASPIRE, and any phase or sub-projects thereof.
- 1.10 "Project Framework Documents" means all bid documents, letters of tender, Agreements, and all such other documents and communications related to the Project.
- 1.11 "Site(s)" means the roof-top(s) and/or the terraces of the building(s) and such other public spaces mutually identified in Addu City to be used for the purpose of Project. The locations, areas and dimensions are more fully described in the ANNEXURE hereto.
- 1.12 "Site Agreements" means any such legal agreements executed to provide a valid and binding leasehold interest in, or an easement, right-of-way, license, or other right in favor of the Investor to use the Site(s) in order to develop the Project.

2. Parties recognize that the successful implementation of the Project is a collective responsibility of GoM and the parties to the Project Framework Documents, and the Parties further acknowledge that ensuring the necessary Site(s) for Investor(s) is critical for the successful implementation of the Project, and to that end;

2.1 the Council hereby undertakes to:

- 2.1.1 enter in to Site Agreement(s) with the Investor(s) in order to secure the Site(s) for the implementation of the Project, under the terms and conditions agreeable to the Parties; and
- 2.1.2 provide necessary support in facilitating adequate resolution of issues or disputes arising out of or in connection with the Site Agreement(s) and in the maintenance of Site(s), in accordance with the provisions of Project Framework Documents and GRM; and
- 2.1.3 fully comply with the provisions of the Site Agreement(s), and carryout such actions, without any undue delay, as maybe required by ME or any other party to the Project Framework Documents to enable such parties and GoM



to comply with the Project Framework Documents in the performance of their obligations thereunder; and

- 2.1.4 fully cooperate with ME, the Investor(s) and such other parties to the Project Framework Documents where necessary, upon any reasonable request by such party in the performance of their obligations under the Project Framework Documents; and
- 2.1.5 not to carry out any communications, in writing or otherwise, which is related to or which shall have an adverse impact on the Project, with Donor, Investor(s), Government Agency, any other party to the Project Framework Documents, or any other third parties, unless such communications are made after consultation with and acquiring the consent of ME; and
- 2.1.6 keep ME informed of any and all communications related to, or which shall have an impact on the Project, exchanged between the Council and the Donor, Investor(s), Government Agency, any other party to the Project Framework Documents, or any other third parties; and
- 2.1.7 disclose to ME such other information related to the Project, without delay, upon any reasonable requests made by ME from time to time; and
- 2.1.8 carry out such actions on its part to enable the parties to the Project Framework Documents to obtain any and all Authorizations required for the execution of the Project under the said Documents.

2.2 ME hereby undertakes to:

- 2.2.1 provide necessary support in facilitating adequate resolution of issues or disputes arising out of or in connection with the Site Agreement(s) and in the maintenance of Site(s), in accordance with the provisions of the Site Agreement(s), the GRM and other Project Framework Agreements; and
- 2.2.2 ensure that no costs arising out of or in connection with the Project shall be borne by the Council, during the subsistence of the Site Agreement(s).

- 3 This MoU shall be effective from the date above mentioned and shall continue in full force unless terminated by either Party upon providing reasonable written notice to the effect or upon determination of the Site Agreement(s), as specified therein.
- 4 The Parties shall appoint a person(s) as a focal point in their organization for the implementation of this MoU and shall inform one another of such appointment.
- 5 All communications pursuant to this MoU, unless otherwise agreed, shall be exchanged in writing and delivered by person or via Government E-letter Management System (GEMS), email or legible facsimile transmission to the addresses set forth below, or to such other addresses, email or telefax numbers either Party duly inform in writing from time to time.

For ME



Name: Mr. Ajwad Musthafa
Designation: Permanent Secretary
Address: Green Building,
Handhuvaree Hingun,
Maafamu, Male', 20392, Republic of Maldives
Email: ps.unit@environment.gov.mv
Fax: +960 3018301

For the Council

Name: Abdulla Sodiq
Designation: Mayor
Address: Secretariat of the Addu City Council
Email: secretariat@adducity.gov.mv
Fax: 688 5002

- 6 Any amendments to this MoU shall be in writing and as may be agreed between the Parties. The Parties shall ensure that such amendment shall not adversely impact the implementation of the Project.
- 7 Any issues or disputes arising out of, relating to, or in connection with this MoU shall be resolved through amicable negotiations among executives or management of the Parties appointed by the Parties for the purpose.
- 8 Parties hereby agree that it is their intention that this MoU shall be executed and delivered in good faith between the Parties and to the best interests of GoM and that if, either Party believes that the other Party is operating in breach of this MoU, or to the detriment of the interests of GoM, the Parties will use their best efforts to agree on such action as may be necessary to amicably remedy such breach or actions.
- 9 The Parties agree that they will hold in confidence the provisions of this MoU, all information, documentation etc., which comes to their knowledge in the course of implementing this MoU (the "Confidential Information").
- 10 The Parties agree not to disclose any Confidential Information without the other Party's prior written consent provided that the Confidential Information may be disclosed to any governmental or regulatory authority requiring such disclosure under law.
- 11 The Parties agree not to publicize at any time, including making public announcements or press statements or issuing press releases of any kind or release any information related to or about this MoU without the other Party's prior written consent.
- 12 This MoU shall be governed by and construed in accordance with the laws of Republic of Maldives.

IN WITNESS THEREOF, the parties hereto, acting through their duly authorized representatives have caused this Memorandum of Understanding to be signed in ADDU CITY on the 29th day of July 2019.



For and on behalf of ME

Name: **DR. HUSSAIN BASHEED HASSAN**

Designation: Minister of Environment

Date: 29 July 2019

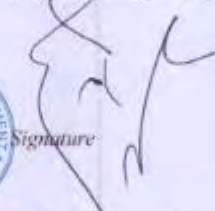

Signature & Seal



In the Presence of:

Name: **Hassan Shiyam Mohamed**

ID Card Number: **A093600**

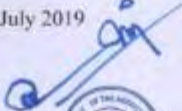

Signature

For and on behalf of the Council

Name: **Abdulla Sadiq**

Designation: Mayor

Date: 29 July 2019

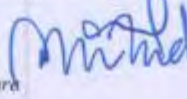

Signature & Seal



In the Presence of:

Name: **MOHAMED YARIF**

ID Card Number: **A062677**


Signature



ANNEXURE

The selection of the Sites listed below are subject to the necessary technical assessments.

Primary Sites				
ID	Location	Heactres	m2	MW
1	Maradhu bandharu (floating)	1.169	11,690	1.67
2	Hulhudhoo Meedhoo medeh banadharu (floating)	2.1601	21,601	3.09
3	Feydhoo bandharu	1.0269	10,269	1.47
4	Hithadhoo bandharu	0.56	5,600	0.80
5	Hithadhoo RAF Area(floating)	8.27	82,700	11.81
6	Stadium parking	0.52	5,200	0.74
7	Hithadhoo Stage Area	0.5804	5,804	0.83
	Total	14	142,864	20.41

Secondary Sites				
ID	Location	Hectares	m2	MW
1	Maradhoo Bandharu (tentative)	1	10,000	1.43
2	Moolekede hikkibin	0.25	2,500	0.36
3	Hulhudhoo Meedhoo land near STP	1	10,000	1.43
	Total	2.25	22,500	3.21



Maradhoo Harbour Floating Solar (ASPIRE Site)



HulhudhooMeedhoo Harbour Floating Solar (ASPIRE Site)



Feydhoo Habour (ASPIRE Site)



Hithadhoo Harbour (ASPIRE Site)



RAF AREA Floating Solar (ASPIRE Site)



Hithadhoo Stadium (ASPIRE Site)



9 Annex 8: Grievance Redress Mechanism of the project

It is important to have an avenue for any affected persons to raise their concerns regarding the project and such issues addressed promptly. For this purpose, a grievance redress mechanism becomes integral part of stakeholder engagement process. The mechanism needs to take into special consideration vulnerable groups and how easy access to the grievance mechanism is ensured to such parties. A three-tier system is defined to ensure a fair process.

The GRM information will be given to the stakeholders during the project consultative meetings. Furthermore, the GRM will be displayed in council notice board, website and a notice board highlighting the process will be installed in each project site.

Tiers of Grievance Mechanism	Nodal Person for Contact	Contacts, Communication and Other Facilitation by Project	Timeframe to address grievance
First Tier: Site level Contractor (During Construction phase) Independent Power Producer (IPP) (for solar) / Electricity Service Provider (ESP) (for battery and grid) (During Operation Phase)	A person designated for the task need to be identified for the purpose by IPP and Electricity Service Provider.	<ul style="list-style-type: none"> In the ESP or IPP or Contractor offices and the project site, there will be an Information Board providing details of the Grievance redress mechanism listing the names and contact telephones/emails. Grievances can be registered by contacting the designated person through phone/email or by submitting a letter of complaint or by filling a Tier-1 complaint form. The Tier-1 form must be available online 	14 working days

		<p>on the websites of the IPP or ESP or Contractor, Ministry of Environment (ME) and from the front office counters of the respective offices. (note PMU of ME should supply the form to respective parties).</p> <ul style="list-style-type: none">• For those who cannot properly write, a staff will assist in filling the complaint form and get it signed by the aggrieved party.• A formal receipt of the complaint will be provided to the aggrieved party.• The IPP/ESP/Contractor will screen the grievance to determine whether the grievance is related to ARISE project or not.• If it is related to the project, the aggrieved party will be informed in writing (copied to ME) how the case will be processed as per this grievance redress mechanism. This should occur within 03 working days of receiving the complaint. If the aggrieved party is unable to read (for whatever reason) the issued letter should be read to the person in presence of a witness and the witness should declare their witness to this event.	
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		<ul style="list-style-type: none"> • Alternatively, if it is not related to the project, the aggrieved party will be informed that it is not related to the project in writing (copied to ME) and will inform how the case will be handled. This communication will occur within 03 working days of receiving the complaint. If the aggrieved party is unable to read (for whatever reason), the issued letter will be read to the person in presence of a witness and the witness should declare their witness to this event. • Where the grievance is related to the project, the IPP/ESP/Contractor will come up with a solution either by (i) discussing internally; (ii) joint problem solving with the aggrieved parties, ME and Island Council or; (iii) a combination of both options. • The IPP/ESP/Contractor will communicate the final decision in writing, in terms how the grievance was handled to the aggrieved party within 14 working days of receiving the complaint. If the aggrieved party 	
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		<p>is unable to read (for whatever reason) the issued letter should be read to the person in presence of a witness and the witness should declare their witness to this event.</p> <ul style="list-style-type: none"> • 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 to the satisfaction of the aggrieved party within 14 working days of submission of the grievance to tier 1 then the aggrieved party may notify local council in writing, of the intention to move to tier 2. 	
<p>Second Tier: Local Council (Island or City Council or any other party which performs such a function)</p>	<p>Local Council will be the second point of contact. Designated contact persons should be established within the Council with a designated contact number.</p>	<ul style="list-style-type: none"> • Where the aggrieved party is not happy with the outcome of the decision by the IPP/ESP/contractor or where the aggrieved party is of the view that the council is not capable of justly solving the issue or where the grievance is not resolved within 14 working 	<p>14 working days</p>

		<p>days the grievance can be upgraded to tier 2.</p> <ul style="list-style-type: none"> • In the council office and the project site there will be an Information Board providing details of the Grievance redress mechanism listing the names and contact telephones/emails. • Grievances can be registered by contacting the local council directed contact person(s) or by submitting a letter of complaint addressed to the Mayor or Council president or by filling a Tier 2 Complaint Form. The Tier-2 form must be available online on the websites of the Island Council, Ministry of Environment (ME) and from the front office counters of the respective offices. (note PMU of ME should supply the form to respective parties). • For those who cannot properly write, a staff will assist in filling the complaint form and get it signed by the aggrieved party. • A formal receipt of the complaint will be provided to the aggrieved party. • The aggrieved party will submit a copy of the decision from tier 1 and the letter submitted 	
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		<p>raising their disagreement to decision where the reason for upgrading to tier 2 is the disagreement with the decision from tier 1.</p> <ul style="list-style-type: none">• The aggrieved party will submit a copy of the grievance form submitted through tier 1 or the grievance letter submitted to council, where the reason for upgrading to tier 2 is due to lack of response from the IPP/ESP/Contractor.• The council will screen the grievance to determine if the issues and concerns raised in the complaint falls within the mandate of the project.• If it is related to the project, the council will inform the aggrieved party in writing (copied to ME) how the case will be processed as per this grievance redress mechanism. This should occur within 03 working days of receiving the complaint. If the aggrieved party is unable to read (for whatever reason) the issued letter will be read to the person in presence of a witness and the witness should declare their witness to this event.	
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		<ul style="list-style-type: none">• Alternatively, if it is not related to the project, the council will inform the aggrieved party that it is not related to the project in writing (copied to ME) and will inform how the case will be handled. This communication will occur within 03 working days of receiving the complaint. If the aggrieved party is unable to read (for whatever reason), the issued letter will be read to the person in presence of a witness and the witness should declare their witness to this event.• Where the grievance is related to the project, the council will come up with a solution either by (i) discussing within the council; (ii) joint problem solving with the aggrieved parties, ME, ESP and the contractor/IPP or; (iii) a combination of both options.• The council will communicate the final decision in writing, in terms how the grievance was handled to the aggrieved party within 14 working days of receiving the complaint. If the aggrieved party is unable to read (for whatever reason) the	
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		<p>issued letter will be read to the person in presence of a witness and the witness should declare their witness to this event.</p> <ul style="list-style-type: none"> • 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 to the satisfaction of the aggrieved party within 14 working days of submission of the grievance to tier 2 then the aggrieved party may notify ME, in writing, of the intention to move to tier 3. 	
Third Tier: Ministry of Environment and Energy	ME will forward the grievance to the Project Management Unit (PMU) of the Ministry. A dedicated number should be allocated to	<ul style="list-style-type: none"> • Where the aggrieved party is not happy with the outcome of the decision by the council or where the aggrieved party is of the view that the council is not capable of justly solve the issue or where the grievance is not resolved within 14 working days the grievance can be upgraded to tier 3. 	14 Working Days

		<p>Grievances can be registered by contacting ME (directed to the contact person(s) or by submitting a letter of complaint addressed to the Minister of Environment or by filling a Tier 3 complaint form.</p> <ul style="list-style-type: none"> • For those who cannot properly write, the ME staff will fill a complaint form and get it signed by the aggrieved party. • A formal receipt of the complaint will be provided to the aggrieved party. • The aggrieved party will submit a copy of the decision from the council and the letter submitted to council raising their disagreement to decision where the reason for upgrading tier 2 is the disagreement with the council decision. • The aggrieved party will submit a copy of the grievance form submitted to council or the grievance letter submitted to council, where the reason for upgrading to tier 2 is due to lack of response from the council. • Ministry will forward all the grievances related to the project to the Project Management Unit. 	
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		<ul style="list-style-type: none">• PMU will screen the grievance to determine if it is related to the project.• If it is related to the project PMU will inform the aggrieved party in writing how the case will be processed as per this grievance redress mechanism. This should occur within 03 working days of receiving the complaint. If the aggrieved party is unable to read (for whatever reason) the issued letter should be read to the person in presence of a witness and the witness should declare their witness to this event.• Alternatively, if it is not related to the project, PMU will inform the aggrieved party that it is not related to the project in writing and should inform how the case will be handled. This communication should occur within 03 working days of receiving the complaint. If the aggrieved party is unable to read (for whatever reason) the issued letter should be read to the person in presence of a witness and the witness should declare their witness to this event.	
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		<ul style="list-style-type: none"> • Where the grievance is related to the project, the PMU will come up with a solution either by (i) Discussing in the project steering committee; (ii) joint problem solving with the aggrieved parties, the council, Energy Service Provider and the contractor/IPP (iii) undertaking site visits and holding onsite discussions or; (iii) a combination of all these options. • The PMU will be responsible to ensure that there is no cost imposed on the aggrieved person, due to the grievance mechanism at the third tier. • ME will communicate the final decision in writing, in terms how the grievance was handled to the aggrieved party within 14 working days of receiving the complaint. If the aggrieved party is unable to read (for whatever reason) the issued letter should be read to the person in presence of a witness and the witness should declare their witness to this event. • The aggrieved party must acknowledge the receipt of 	
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		<p>decision and submit their agreement or disagreement with the decision within 10 days.</p> <ul style="list-style-type: none"> • If no acknowledgement is submitted from the aggrieved party then the decision will be considered as accepted. 	
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In addition to the system established through the project, legal mechanisms are available for any aggrieved party if they are to pursue that option. In such cases, established legal practice as per the laws of the country will be followed. Moreover, if any request for information is made through RTI, the set procedure established under the act will follow and the information officer identified by the Ministry will attend to it, if a request is made to ME.

At the project offices (ME, ESP, IPP and Island Council) the information on the focal points responsible for implementation of this GRM needs to be displayed in the notice board and also on social media platforms in the following format:

Description	Contact details
Company:	
To:	
Address:	
E-mail:	
Website:	
Telephone:	

10 Annex 9: Indicative Mitigation Plan For the Identified Risks

Aspect	Indicative Mitigation Measures
Construction Site and Construction Workers	<ul style="list-style-type: none"> • All provisions that are required under Health and Safety Regulation for Construction Industry (2019/R-156) should be strictly adhered. • All workers should be provided with Personal Protective Equipment (PPE) by the contractor/Investor. In this regard the following needs to be observed: • Hard hats should be used by all workers when undertaking construction and when undertaking inspections at height. <ul style="list-style-type: none"> ✓ Enclosed safety shoes should be worn by all construction workers. ✓ Safety harness should be used by all workers when climbing heights at project sites. ✓ Electrical Protective gloves should be provided to workers when dealing with electrical components. ✓ Chemical protective gloves should be provided to all workers when dealing with any chemicals. ✓ Construction safety goggles should be worn by all construction workers. ✓ Ear plugs should be worn by all construction workers working in environments with high noise (working above 75 decibels). ✓ Masks should be worn when dealing with chemicals and when working in dusty environments. • All chemicals should be stored on hard surfaces and should be covered. • Portable drinking water should be available at the construction site during construction phase. • Adequate safety signs should be installed at the work site giving clear direction. These should be provided in addition to English, Dhivehi and in the language of the workforce. • Construction work site should be demarcated & fenced, and warning signs should be displayed both in English and Dhivehi. • When construction is undertaken clearly demarcated bins for waste disposal needs to be placed and emptied daily. • Open pits should not be left for water to accumulate for a long time. • Any stockpiled sand needs to be covered to prevent sand particles from being airborne. • All vehicles and equipment used for the project needs to be used by well trained personnel. • Any scaffolding used should be to British Standard (BS1139). • When working at night adequate lighting should be provided. • A designated toilet facility should be available within 10 minutes of the construction site. • Breaks should be given to the workforce during mealtimes.

	<ul style="list-style-type: none"> • Fire fighting equipment should be available at the construction site, at the workers accommodation and any storage areas used for the project. • The site needs to be cleaned daily following completion of days work. • The maximum working hours of all construction workers should be 48 hours per week as per the Employment Act of Maldives.
Storage and use of hazardous chemicals	<ul style="list-style-type: none"> • Any chemicals, fuels, waste oil and hazardous waste should be handled and transported carefully. All such chemicals and wastes should be stored and transported in sealed containers. Such chemicals and wastes should be stored in concrete hard surfaces to prevent impacts through any leakages. • Stored containers should be regularly inspected to identify any leakages. • The storage for any hazardous material and any refueling activities should be undertaken outside the 20m Environmental Protection Zone of the island. • Any hazardous material storage areas should have fire fighting equipment. • All vehicle/machinery and equipment operation, maintenance and refueling will be carried out in such a fashion that spillage of fuels and lubricants does not contaminate the ground. • All activities should be undertaken in presence of an experienced supervisor. • Chemical protective gloves, goggles, masks and safety shoes need to be worn when handling any hazardous material.
Transport, handling and Storage of Solar PV	<ul style="list-style-type: none"> • Mechanical equipment (forklift) should be used when handling the containers with PV Panels during transport. • When moving packaged boxes to construction site, forklift should be used. • Transport should be coordinated with island council and Police. • If opening the box outside, please avoid rainy conditions. The rain will soften the box, may damage the modules and cause physical harm to the staff. • If the wind is too heavy avoid handling solar panels • The box should be placed horizontally to avoid tilting. • All staff involved in transport, storage and handling of Solar PV should wear gloves, safety shoes, safety goggles and hard hats. • Do not step on cartons containing PV modules
Operation of Batching plant	<p>1. Maintenance of the general site operations</p> <ul style="list-style-type: none"> • Maintain all the equipment including dust collection equipment to prevent any leaks. • Concrete batching operation needs to be undertaken away from residential locations to minimize dust and noise impacts. • Concrete batching operation should be undertaken away from the Protected Areas.

	<ul style="list-style-type: none"> • All concrete mixing operations should be undertaken during daytime to minimize noise impacts. • All staff involved in batch plant operation should wear, safety hats, dust masks, safety shoes, goggles and gloves. • Required safety signs should be installed at the batching plant site with warnings for dust and noise highlighted. <p>2. Material handling and storage</p> <ul style="list-style-type: none"> • Aggregates and sand required for concrete mixing should be handled and stored in an enclosed space. Enclosed storage bins or enclosed sealed bags. • As much as possible avoid using chemical concrete additives since they are more toxic. Instead, use sugar or wood based admixers. • Where chemical additives are approved to be used, need to store them in an enclosed space on a hard-impermeable surface. <p>3. Mixer feed operations</p> <ul style="list-style-type: none"> • Use the enclosed batch mixer feed as dust prevention and visible emissions. • Use the spray device to prevent dust emissions. • Conduct all the mixing operations from an enclosed space to help prevent emission of dust. <p>4. Conveyors</p> <ul style="list-style-type: none"> • To prevent dust emissions, the belt conveyors should be enclosed on both sides. • All conveyor transfer points should be enclosed by fitting the flexible seals to prevent dust. • The turning point of any conveyor should be provided with scrapers to prevent dust collection on the surface belt <p>5. Mixing and loading operations</p> <ul style="list-style-type: none"> • Loading concrete should be in such a way that minimizes dust emissions. • All the air borne dust emission generated by material loading and mixing operations should be vented to fabric filtering system. • The concrete mixers and other vehicles should be cleaned off after the loading and mixing operations to wash off the mud, dust deposited on the wheels and body. <p>6. Fugitive dust</p> <ul style="list-style-type: none"> • Use water sprays or dust suppression agents to reduce dust. • An air extraction and filtration system for collecting the generated dust should be installed. <p>7. Waste concrete</p> <ul style="list-style-type: none"> • Collect the waste concrete in suitable washout pits where it becomes gravel, sludge and sand which can later be reused. <p>8. Waste water</p> <ul style="list-style-type: none"> • Waste and contaminated water should be directed to onsite settling ponds and it can be reused later in for dust control, rinsing trucks exteriors.
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Vegetation Removal and levelling	<ul style="list-style-type: none"> • Where trees and palms fall within the project footprint, option to relocate any trees and palms should be considered first. • If relocation is not feasible due to status of the tree/palm (for example palms that are too old and unlikely to survive elsewhere) or due to lack of available space to replant for every tree/palm removed two trees /palms need to be planted at a location identified by the city council. • No vegetation within the 20 m coastal zone should be removed for the purpose of the project. • No protected trees should be removed as part of the project. • Any construction area needs to be levelled to preexisting levels.
Solid and construction waste during construction phase	<ul style="list-style-type: none"> • For domestic waste produced by the staff clearly demarcated bins for waste disposal needs to be placed and emptied daily. • For construction solid waste should be cleared from work site every day and placed in a designated location.
Solar Panel waste following lifetime	<ul style="list-style-type: none"> • The panels should be either recycled or taken to a certified e-waste management facility. Preference should be given to recycling. Prior approval needs to be attained from Ministry prior to undertaking this activity.
Emissions from vehicles	<ul style="list-style-type: none"> • All vehicles used for the project should have an up to date road worthiness.
Dust, Noise and Vibration	<ul style="list-style-type: none"> • Restricting working hours from morning 06 to evening 06. • Keeping construction equipment properly stored and secured at a location approved by the council • Materials that are stockpiled at the location for a long period of time should be covered to minimize impact of dust generation due to windy conditions. • Ensure that the construction site is wetted regularly to minimize impact of dust as a result of the project.
Groundwater	<ul style="list-style-type: none"> • All chemicals used should be stored on hard surfaces on enclosed spaces. • All chemicals should be handled using chemical protective gloves. • All storage containers need to be inspected regularly for any leaks. • Where dewatering is required, the dewatering permit should be attained as per the requirements of Dewatering Regulation (R-1697/2013). • Dewatering activities where required needs to be completed within the shortest possible time.
Road closure and road safety	<ul style="list-style-type: none"> • All closures need to be preannounced • All road closures need to be coordinated with the council and Police • Clear markings need to be placed on roads during road closure with indicative lights and warning signs. • Following backfilling and resurfacing where required, must ensure that preexisting levels are maintained.

	<ul style="list-style-type: none"> • The solar panels need to be placed at a height and angle such that glare doesn't become an issue for the vehicles.
Impacts on recreational spaces close to installation site	<ul style="list-style-type: none"> • The construction work should be limited to the footprint of the planned PV installation. • No equipment, vehicles should be left unattended. • Area in which construction work is undergoing should be closed off for public access. • Appropriate safety signs should be placed at the construction site in both English and Dhivehi.
Damage to Utility lines and other cables	<ul style="list-style-type: none"> • The investor/contractor should come into agreement with each and every service provider regarding how any damage is going to be fixed. • Identify the cable routes, utility lines prior to construction commencement and ensure that such areas are avoided. • Where chance damage occurs the investor needs to make arrangements to fix the damage within 24 hours of damage.
Labour related impacts	<ul style="list-style-type: none"> • If foreign labour is used the labour force needs to be briefed on the language, culture and customs of Maldives. • The labour force needs to be provided information on the rules and regulations pertaining to protected areas of Addu. • It is imperative that the comprehensive Labour Management Procedures (LMP) developed for the project is followed (link: https://www.environment.gov.mv/v2/en/download/10026) • Constant and reliable electricity supply should be available at project office and accommodation site. • Shower and toilet facilities should be available at temporary accommodation site. • Toilet and drainage should be connected to local sewer system, where not available septic tanks should be used for treatment prior to disposal. • A minimum ratio of 01 toilet/shower per 20 workers should be maintained. Separate facilities should be provided for men and women. • Individual bedding should be provided to all workers. • Storage space for individual belongings should be provided for all workers. • Male and Female workforce needs to be housed separately. • Designated locations for waste disposal with clearly marked bins needs be established. Bins need to be emptied daily. • Sufficient lighting and cooling systems need to be established. • Portable drinking water should be provided. • The site needs to be cleaned daily. • Monthly inspections to determine pest infestation of the site should be undertaken. • Meals if prepared from a local café or restaurant should be from a Maldives Food and Drug Authority certified facility. • If foreign labor is used, prior to mobilization the construction workers should be briefed in their language on customs of Maldives.

	<ul style="list-style-type: none">• If Covid19 restrictions are in place all guidelines issued by Health Protection Agency of Maldives need to be followed.• If Covid19 restrictions are in place, investor/contract needs to attain advice Health Protection Agency of Maldives prior to mobilization and any guidance needs to be strictly followed.
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11 Annex 10: Risk Matrix

Construction phase						
Risks	Party at risk	Probability	Sginificance	Overall score Risk Score	Risk Level	Comments
Vegetation Clearance	Environment	10	5	15	High	Significant vegetation removal involved especially in HulhudhooMeedhoo site
Disruption of transport activities	Public	3	3	6	Low	Can occur during cable laying, however very minimal cable laying involved with proper coordination with authorities impacts are unlikely.
Noise disturbance	Public/Environment	1	5	6	Low	Considering the construction methodology low

Vibration disturbance	Public/Environment	1	5	6	Low	Considering the construction methodology low
Falling to open pits	Public/Workforce	3	7	10	Moderate	Can be managed with proper mitigation measures/supervision
Mosquito breeding at open pits	Public	3	7	10	Moderate	Can be managed with proper mitigation measures/supervision
Electrocution due to open wiring	Public/Workforce	3	8	11	Moderate	Can be managed with proper mitigation measures/supervision
Falling objects as the project involves working at heights	Public/Workforce	3	8	11	Moderate	Can be managed with proper mitigation measures/supervision
Unattended equipment left in site without proper supervision leading to public use accidents and hazards.	Public	2	8	10	Moderate	Can be managed with proper mitigation measures/supervision
Chemicals (this primarily include water proofing agents, any other approved admixtures used for concreting and used oil) at site left unattended can expose the public to health hazards.	Public	2	8	9	Moderate	Can be managed with proper mitigation measures/supervision
Exposure to dust from concrete mixing.	Public/Workforce	5	8	13	Moderate	Can be managed with proper mitigation measures/supervision

Damage to cables and utility lines	Other service providers	8	8	16	High	In most of the islands the exact location of cables are difficult to determine, hence the risk is high
Damage to public buildings during cable laying works	Public	3	3	6	Low	Based on the small scope highly unlikely
Risk of spills from fuels, chemicals, waste oil and other hazardous materials used during construction phase.	Environment/Public	4	8	12	Moderate	Can be managed with proper mitigation measures/supervision
Road accidents as a result of construction work	Public/workforce	4	8	12	Moderate	Can be managed with proper mitigation measures/supervision
Flooding Impact due to inadequate levelling	Environment/Public	2	6	8	Moderate	Can be managed with proper mitigation measures/supervision
Impacts on environmentally protected and sensitive areas	Environment	3	5	8	Moderate	Can be managed with proper mitigation measures/supervision
Impact on biodiversity (protected species, sensitive species etc)	Environment	3	5	8	Moderate	Can be managed with proper mitigation measures/supervision
Risk of Fire	Public/Worforce	3	8	11	Moderate	Can be managed with proper mitigation measures/supervision

Injury construction workforce due to improper use of equipment/machinery and work methodology	Workforce	4	8	12	Moderate	Can be managed with proper mitigation measures/supervision
Lack of Sanitation and clean drinking water at worker accomodation and project site(s)	Workforce	4	8	12	Moderate	Can be managed with proper mitigation measures/supervision
Overcongestion of workforce in small space	Workforce	6	7	13	Moderate	Can be managed with proper mitigation measures/supervision
Unhygenic food available for construction workfoce	Workforce	4	7	11	Moderate	Can be managed with proper mitigation measures/supervision
Lack of access to shower facility at worker accomodation	Workforce	2	8	10	Moderate	Can be managed with proper mitigation measures/supervision
Lack of adequate meals	Workfoce	2	8	10	Moderate	Can be managed with proper mitigation measures/supervision
Mosquito breeding at worker accomodation and project site (s)	Public/Workforce	8	7	15	High	Common issue in construction sites in Maldives hence the risk is high
Pest infestation at worker accomodation and project site (s)	Public/Workforce	8	7	15	High	Common issue in construction sites in Maldives hence the risk is high

Social conflicts with community	Public	1	5	6	Low	Even though there is a recent increase in such cases, was a whole considering the amount of projects undertaken such issues occur rarely
Covid 19 transmission through contractor workforce to the community	Public	3	8	11	Moderate	Can be managed by adhering to the guidelines by Health Protection Agency
Lack of clearly demarcated designated areas for waste disposal at the project site (s)	Environment/Public	5	8	13	Moderate	Can be managed with proper mitigation measures/supervision
Emissions from vehicles used in construction leading to air pollution	Environment/pollution	3	3	6	Low	From a global scale any emissions from the project will be minimal. Can be reduced negligible with proper mitigation and supervision
Gender based violence by the construction workforce	Public	1	5	6	Low	As a whole considering the amount of projects undertaken such issues occur rarely in Maldives
Visual aesthetic impacts	Public	1	5	6	Low	The concepts are made such that the aesthetics are not compromised

Disturbance to mosque users for the site in Hithadhoo harbour	Public	5	8	13	Moderate	Can be managed with proper mitigation measures/supervision
Loading and Unloading difficulties at Hithadhoo harbour	Public/ boat owners/businesses	6	7	13	Moderate	Considering the distance from the harbour some impacts can occur during construction phase, however can be managed with proper mitigation and supervision
Disruption of recreational activities undertaken at Addu Football Stadium	Public	6	6	12	Moderate	Some disturbances can occur during construction phase, however can be managed with proper mitigation measures and supervision
Damage to revetment at Feydhoo site	Public	1	5	6	Low	Distance from the revetment is maintained as per the requirements of Ministry of National Planning and infrastructure, thus impacts are unlikely to occur

Operational phase						
Risks	Party at risk	Probability	Sginificance	Overall score Risk Score	Risk Level	Comments
Risk of damage to structure due to lack of maintenance leading public hazards	Public/Environment	3	3	6	Low	It is in the best interest of the developer to maintain the site, as the developer sells electricity to utility through PPA.
Transformer if not enclosed leading to electrocution to public	Public	3	3	6	Low	Through design/supervision will ensure that it is enclosed
Risk of fire due to faults in electrical equipments	Public/Workforce	3	3	6	Low	International standards are used to ensure quality of installation, hence unlikely
Lightening risk	Public	1	3	4	Low	

Improper disposal of hazardous waste	Public	1	3	4	Low	Conditioned in agreements, can be managed with proper supervision
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Scoring scheme for risks	
0 to 7	Low
7 to 14	Medium
14 to 20	High