

# 1 Environmental and Social Screening Report: Installation of 1 MW Ground Mounted Solar PV in Hinnavaru


*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.*

- **Description of Intervention**

### Project Identification

Project title	Installation of 1 MW solar PV Installation in Hinnavaru under Accelerating Sustainable Private Investment in Renewable Energy (ASPIRE) project
Project Proponent	Ministry of Environment

### Project Location

Location	<p><b>(Location Map and Site Photographs to be Annexed): Attached in Annex1</b></p> <p>Hinnavaru is the second most populous of Lhaviyani atoll. Located north-west of the atoll with geographic coordinates of 5°29'35.85"N, 73°24'46.07"E. The resident population of Hinnavaru is 2683. Like many other islands selected for the project Hinnavaru also has significant reclaimed land, total land area of Hinnavaru is 50 ha of which around 50 percent is reclaimed. The island is around 5 kilometers from the new domestic airport being built in Madivaru.</p>  <p>Figure 1 Location map of Hinnavaru</p> <p>There are no salient environmental features that are of significance in Hinnavaru. In terms of history and culture like some other islands in Lhaviyani atoll, the roads and households of Hinnavaru are unique, in this regard very narrow streets with living</p>
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quarters in one side of the road and kitchen in other side of the road are the norm in some older households.

Definition of Project Area  
*(The geographical extent of the project & areas affected during construction)*

The project involves installation 1MW of Solar PV in multiple locations in the reclaimed land of Hinnavaru. These locations are provided in the land use maps below (Figure 2, Please refer Annex 1 for full size maps). This includes two areas near the revetment, an area near the island waste management centre, an area near the football stadium and an area allocated in the utility zone as per the land use plan. A total area of 9,113 m<sup>2</sup> of usable space has been allocated for PV installation (Figure 2 and Annex 1). As seen in figure 2, these areas can primarily be characterized as follows:

- Northern Section near Revetment: This location is 10 meters from revetment. As per the land approval given by Maldives Land Survey Authority (MLSA) a minimum of 10 meters should be left for Environmental Protection Zone (EPZ) from the revetment (see Annex 6 approval letter by land survey authority). Hence 10 meter space was left before finalizing this location. A total 5485 m<sup>2</sup> has been allocated from this location for PV installation. Even though an area of 5485, have been approved by MLSA, the usable land based on vegetation pattern is around 4814 square meters. As seen from Figure 2 there is a patch of casuarina trees at the southern side of approved location. As per the Regulation on Cutting down, Uprooting and Transfer of trees and palms from one island to another, no vegetation within 15 meters of the shoreline can be removed for any purpose. Hence, for this project from this location an area of 4814 square meters will be used (Figure 3 & Annex 1). Moreover, it is a requirement of the land approval that the height of the panels at this location to be at a minimum of 4.5 meters. In the meetings that were held with Ministry of Planning, Housing and Infrastructure regarding this site, it was highlighted that since it is the tourism location they will prefer to reduce the number of footings, if feasible and it was suggested to go for a single footing structure for this location.

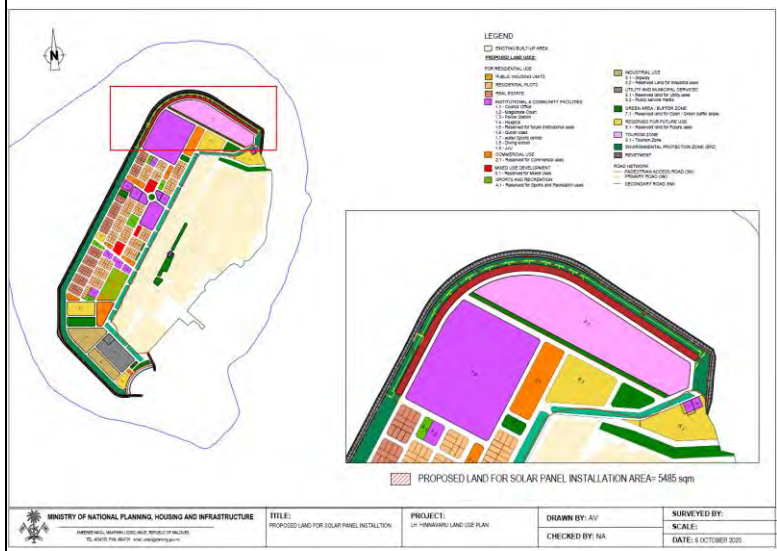


Figure 2 PV Installation Northern Section near revetment



Figure 3 aerial map of pv installation area at northern hinnavaru

- South-western section near the revetment: Similar to above this section is selected after leaving the required 10 meters from revetment for EPZ. A total of 1364 m<sup>2</sup> has been allocated from this location for PV installation (Figure 4 and 5). Similar to above location 1, it is a requirement of the land approval that the height of the panels at this location to be at a minimum of 04 meters.

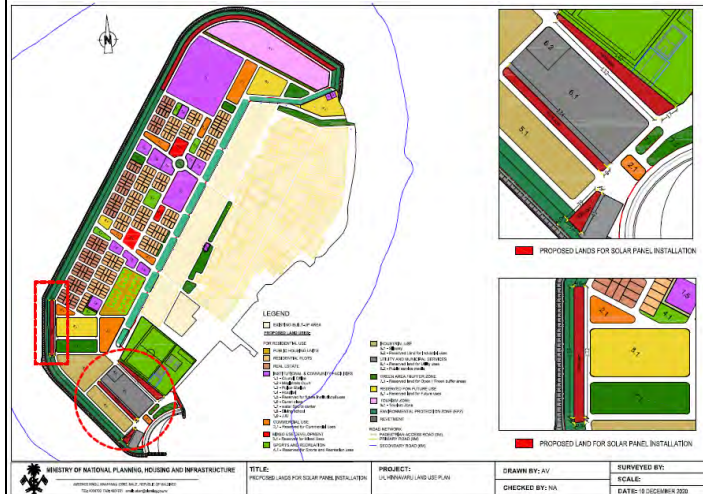


Figure 4 PV Locations in the Southern and south-western site



Figure 5 Aerial map of PV Installation area at south-western hinnavaru

- Southern sites (red circle in Figure 4 and Figure 6): Three separate sites have been allocated from this location. This includes the following:
- Adjacent to IWMC: An area of 426 m<sup>2</sup> has been allocated from this location (Figure 4 & 6).
- Utility zone: From the utility zone an area of 1034 m<sup>2</sup> has been allocated from this location (Figure 4 & 6).
- Adjacent to football stadium: An area of 1475 m<sup>2</sup> has been allocated from this location (Figure 4 & 6).



Figure 6 aerial map of PV installation areas at southern hinnavaru

The council has identified some complementary land use underneath the panels for each of the sites identified above. The intended use underneath the panel is summarized below.			
ID	Location	Requirements	Usable Area (sqm)
1	Northern Section near revetment	Should accommodate low growing coastal vegetation/ Walkway/ Should be aesthetically pleasing. Should be a minimum of 4.5 meters in height.	4814
2	South Western Section near revetment	Should accommodate low growing coastal vegetation/Walkway/ Should be aesthetically pleasing	1364
3a	Adjacent to IWMC	Parking	426
3b	Utilize Zone	Parking	1034
3c	Adjacent to football Stadium	Parking	1475

Adjacent land and features	<p>In terms of adjacent land features the following can be identified:</p> <ul style="list-style-type: none"> <li>• Northern Section near the revetment: This at present is barren land (Figure 3 and Annex 1). As for planned developments shown in the land use plan (Annex 5 and Figure 2), the northern section near the revetment is close to tourism area and land designated for government use. As per the land use plan there is a 09 meter road between the PV installation area and these planned developments.</li> <li>• The south-western section near the revetment: This at present is also a barren land (Figure 5 and Annex 1). As per the approved land use plan this site is close to land reserved for future use and a green buffer area (Figure 4). As per the land use plan there is a 09 meter road between the PV installation area and these planned developments.</li> <li>• Southern sites:</li> <li>• Site near IWMC: This is sandwiched between the IWMC and the boatyard (Figure 6 and Annex 1). Boat building activities using fiberglass is undertaken at the boatyard.</li> <li>• Utility Zone: This location at present is barren land (Figure 6 and Annex 1). This area has been selected as a small part of overall area that is allocated for utility service infrastructure as per the land use plan (Annex 5 and Figure 4). As per the land use plan in front of this site is boat building area and there is a 09 meter road in front of this site.</li> </ul>
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	<ul style="list-style-type: none"> <li>• Adjacent to Football Stadium: Football stadium and associated infrastructure are the primary infrastructure next to this site. The stadium fence is immediately adjacent to this site (Figure 6 and Annex 1). As per the land use plan there is a 09 meter road in front of this site.</li> </ul>
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**. Project Justification**

<p>Need for the project <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 (<a href="https://presidency.gov.mv/SAP/">https://presidency.gov.mv/SAP/</a>) 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 <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 (<a href="https://presidency.gov.mv/SAP/">https://presidency.gov.mv/SAP/</a>) 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 Hinnavaru. This project when implemented will achieve 120% of peak load of electricity from renewable energy sources.</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<sup>1</sup>. 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</p>

<sup>1</sup> source: <https://www.irena.org/publications/2020/Jun/Renewable-Power-Costs-in-2019>

	<p>high, with an average between 5.4 kWh/m<sup>2</sup> and 5.7 kWh/m<sup>2</sup>. The highest GHI is identified in the South of the archipelago, where average daily sums exceed 5.6 kWh/m<sup>2</sup> (yearly sum about 2050 kWh/m<sup>2</sup>) and more. The season of highest irradiation with daily sums above 6.2 kWh/km<sup>2</sup> lasts three months (from February to April). Second season of higher solar radiation, with daily sums from 5.3 to 5.6 kWh/m<sup>2</sup>, is found in a period from August to October 2.</p> <p>Another option is to put Solar PV on roof tops. In this regard for Hinnavaru rooftop of the school was considered as an alternative. Where required the school roof will be used.</p>
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### . Project Description

Proposed start date	April 2021
Proposed completion date	March 2022
Estimated total cost	Total cost will depend on the investor selected. An estimate of around USD 1 million for construction.
Present land ownership	<p>Approval from the Council, and the Maldives Land Survey Authority (MLSA) was obtained for solar PV installation (see Annex 6).</p> <p>Land is owned by council. MOU is signed with the council. The MOU is provided in Annex 7 of this screening report.</p> <p>The MOU guarantees the following key points:</p> <ul style="list-style-type: none"> <li>• Agreement between ME and the landowner securing the sites</li> <li>• Utilize any lease fees that is acquired through the sites via the investor for the benefit of the community</li> <li>• Resolution of issues that arise during project implementation through the Grievance Redress Mechanism (GRM) and disputes through the lease or license agreement</li> <li>• Ensuring that no cost will be incurred by the council for the purpose of project implementation.</li> </ul>
Description of the project <i>(with supporting material such as maps, drawings etc attached as required)</i>	The project involves installation 1MW of Solar PV in multiple locations in the reclaimed land of Hinnavaru. These locations are provided in the land use maps above in the project area description (see Annex 1 and Annex 5 for full scale maps). This includes two areas near the revetment, an area near the island waste management centre, an area near the football stadium and an area allocated in the utility zone as per the land use plan. A total area of 9,784 m <sup>2</sup> has been allocated for PV installation (see project area description above and Annex 5).
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>

2 source: <https://www.esmap.org/node/3298>

	Mohamed Hamdhaan Zuhair: Environmental and Social Safeguards Specialist Abdulla Afsal: Procurement Management Specialist Ifaad Waheed: Communications Specialist Akram Waheed: Senior Energy Specialist Nuzhath Ahmed: Project Coordinator Aminath Hanaan Mohamed: Monitoring and Evaluation Specialist
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- **Site Description Questionnaire**

- **Site Setting and Land use/Ownership**

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

Please find attached the land approval from Maldives Land Survey Authority (MLSA) and Hinnavaru Island council. The land is owned by the Island Council of Hinnavaru (Check Annex 6 and 7).

- What is the current land use of the site?

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

- When was the site first developed to the current land use?

The reclamation of Hinnavaru in 2014 was undertaken mainly as the island is full and to allocate space for new residential developments. However, like many such reclaimed islands, no activities have been undertaken in the land as of now. The approved land use plan with solar installation areas marked is provided in Annex 5 of this screening document.

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

Reclaimed land hence no particular historical use

- 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.

- **Consultations with island council/local communities and civil society organizations**

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 screening phase, consultation was conducted with the council and an island wide survey was undertaken online by coordinating with the Hinnavaru council. The details of these are provided in Annex 3 and 4 respectively.

A total of 42 responses were received from Hinnavaru for the survey. This represents around 1.56% of the resident population. Unlike other islands, a majority of respondents of Hinnavaru was women; in this regard 60% of the



survey respondents were women and 40% men. Majority of the respondents are youth of the island with 25 to 35 years being the dominant age group.

Based on the survey results, overall it can be seen that the public of Hinnavaru are very keen and positive regarding the project. With 92.5% of the surveyed public suggesting that the interventions planned through the project are beneficial. The text analysis done identified inherent environmental benefits of Solar installation 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 expectation of attaining a more reliable electricity supply.

In terms of location, 92.50% of the survey respondents are happy with the location<sup>3</sup>. Similarly, in terms of impacts, issues raised regarding labour force, traffic, vegetation and groundwater can be adequately addressed through the proposed mitigation measures, the details of which are provided in the social survey reports annexed to this form.

***Additional information required from island council:***

**1. *Current and projected population;***

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

Total: 2683

Male: 1337

Female: 1345

**2. *Number of households (and Empty houses);*** 875 households and 32 empty plots (information from council)

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

**4. *Present employment by industry;*** As per household income and expenditure survey of 2016 which has data for Lhaviyani atoll as a whole the distribution is as follows:

Agriculture: 18%

Other Industry: 22%

Service: 59%

**5. *Income distribution;***

Based on household income and expenditure survey of 2016 for Lhaviyani atoll Labour Force Participation rate is 51.5 % and as per the survey on average women earn MVR58.32 per hour while men earn on average MVR52.7 per hour

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

Currently there is a health centre.

Land has been allocated for a 30 bed hospital in Hinnavaru (source: <https://edition.mv/news/11147>).

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<sup>3</sup> Note that at the time of the survey only the northern section near revetment was included as at the time the total area was proposed to take from this location. However Ministry of National Planning

• **Screening for Potential Environmental Impacts in relation to the proposed project intervention**

	Screening question	Yes	No	Significance of the effect (Low, moderate, high)	Remarks
<b>Section A: General</b>					
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		Low	<p>No major changes are anticipated. In terms of vegetation. No major vegetation is expected to be removed as part of the project. The following are observed in terms of each of the sites.</p> <ul style="list-style-type: none"> <li>Northern site near the revetment: As mentioned previously part of the approved area from MLSA and Hinnavaru council has many casuarina trees. This area will not be cleared, hence not used for PV installation, to align with local environmental regulations. Hence, the usable area is reduced to 4814 square meters in this site. Other than this, around 20 coastal plants are close to the site (Annex 1). However, it does not seem to fall within the footprint. This includes low growing plants found in the coastal areas including Ironwood (kuredhi) and Sea Lettuce (Magoo). Thus, no vegetation is expected to be removed.</li> <li>South western site near the revetment: There are some casuarina trees (Fithuroanu) near this site (Annex 1). Some branches of these trees may have to be trimmed in order to reduce shading impacts. As mentioned before, removal of any tree within the 15 meter zone of shoreline is not allowed as per local environmental regulations.</li> <li>Southern sites:</li> </ul>

					<ul style="list-style-type: none"> <li>• Site near IWMC: Except a few shrubs no notable vegetation found in this location (Annex 1).</li> <li>• Utility Zone: This location does not have any vegetation (Annex 1)</li> <li>• Adjacent to Football Stadium: Except few shrubs no notable vegetation found in this location.</li> </ul> <p>It is a requirement of land use approval to be able to grow coastal vegetation underneath the structure at the two sites near the revetment as indicated previously.</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?	<b>Yes</b>		<b>Moderate</b>	<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"> <li>• Risk of spills from fuels, chemicals, waste oil and other hazardous materials used during construction phase.</li> <li>• Health risks associated with storage, handling and transport of Solar PV.</li> </ul> <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?	<b>Yes</b>		<b>Moderate</b>	<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 through the island council. Any remaining waste can be transferred to</p>

				<p>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?	<b>Yes</b>	<b>Low</b>	<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 material needs to be imported, this again increases the carbon footprint of the project.</p> <p>As Maldives, at present, does not have a hazardous/ E-waste management facility, once the lifetime of the panels are up it needs to be transferred to a facility in another country. This transfer will increase the carbon footprint of the overall project.</p>

					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. Noise may also be generated during foundation works if piling method is used.</p> <p>Vibrations can also occur if piling is opted as a foundation method. The foundation method has not yet being finalized at this stage will be determined by the selected investor. Where piling is opted preference should be given to a method that causes minimal vibration, like screw piling rather than hammering.</p> <p>As for operational phase, depending on angle, light reflection from the panels can result in disturbances to the road users.</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 waste that is stored. This may include; water proofing agents, concrete admixtures, waste oil that needs storing.
7	Will the project cause localized flooding and poor drainage during construction?  Is the project area located in a flooding location?	Yes		Low	<p>If not properly leveled following construction of panels and cable laying can lead to localized water accumulation.</p> <p>The reclaimed land is at a higher level than the natural island level, hence the project is not located in a flood prone area.</p>
8	Will there be any risks and vulnerabilities to public safety due to physical hazards during construction or operation of the Project?	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"> <li>• Falling to open pits</li> <li>• Open pits at project site left for a long time can lead to mosquito breeding</li> <li>• Electrocutation due to open wiring</li> <li>• Falling objects as the project involves working at heights</li> </ul>

					<ul style="list-style-type: none"> <li>• Unattended equipment left in site without proper supervision leading to public use accidents and hazards.</li> <li>• 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.</li> <li>• Exposure to dust from concrete mixing.</li> </ul> <p>During operational phase the main risks to the public can be identified as follows:</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Light reflected from the panels if not appropriate height and angle can lead to road accidents.</li> <li>• The transformer if not enclosed can lead to electrocution risk to public.</li> <li>• Potential risk of fire due to faults in electronic equipment.</li> <li>• Potential risk of lightning</li> </ul>
9	Are there any transport routes on or around the location which are susceptible to congestion or which cause environmental problems, which could be affected by the project?	Yes		Low	<p>As indicated many of these PV structures are planned to be developed adjacent to proposed roads. And the PV interconnection cables will run through roads. This can lead to some road closures.</p> <p>However as these are small island communities not much traffic issues are expected as a result of the project. Especially, since all the PVs are located in the reclaimed land and since this area is</p>

					mostly barren at present not much impacts are anticipated.
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?	<b>Yes</b>		<b>Low</b>	As highlighted, the planned tourism zone is around 09m south of the northern location close to revetment. Thus, this site is located within tourism zone, hence aesthetically the final design of the panels need to be pleasing.  Of the remaining sites, there is a site close to the football stadium. Underneath the panel is planned to be used for parking by the stadium users, hence this can be seen as a positive impact.
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?	<b>Yes</b>		<b>Low</b>	Two of the locations are near the revetment of which the northern section is in the tourism zone. If the panels are too low it can block the sea view. It is a requirement of the approval to keep the panels at minimum 4.5 meter height at these locations.
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?		<b>No</b>	<b>N/A</b>	Construction activities planned to be undertaken in reclaimed land.
13	Is the location within or adjacent to the coastal zone? If so, what is the distance to the coast?	<b>Yes</b>		<b>Moderate</b>	Two of the proposed areas are 10 meters from the coastal protection revetment on the landward side.
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?		<b>No</b>	<b>N/A</b>	It is in reclaimed land

15	Are there mangrove, coral reef, sea grass bed, turtle beach habitats etc within close proximity?		No	N/A	It is reclaimed land, no known environmentally significant areas are in Hinnavaru.
16	Is the project located in a previously undeveloped area where there will be loss of green-field land		No	N/A	Even though it is undeveloped, it is reclaimed land, thus no loss of significant vegetation is expected. Only few coastal shrubs may need to be relocated and/or removed.
17	Will the project cause the removal of trees in the locality?	Yes		Low	As previously mentioned, no mature trees are expected to be removed. The area where mature causirina trees are there will not be used as part of the project even though the land approval covers this area (see Figure 3 area marked in green). Of the shrubs also only those that fall within the footprint of the footings will be removed. The option to relocate will be considered first prior to removal of any vegetation.
18	Can any of the identified historic or culturally importance sites on or around the location be affected by the project?		No	N/A	As reclaimed land no such places will be present in this location
19	Are there existing land uses on or around the location e.g. 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?	Yes		Low	As highlighted previously only two of the locations are near existing infrastructure. One location is near the football stadium and another near the IWMC and the boatyard. The project is expected to positively impact these locations as underneath the panels will be used for parking in these areas, hence parking spaces are created through the project.  As for future land use northern section near the revetment is close to the proposed tourism zone. Hence the council and MLSA require the panels installed in this area to be aesthetically pleasing and the height of the panels to be a minimum of 4.5 meters.
20	Are there any areas on or around the location which are densely populated or built-up,		No	N/A	The project is undertaken in the reclaimed land of the island where at present very few activities in terms of existing land usage are undertaken.



	which could be affected by the project?				
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	<b>Yes</b>		<b>Low</b>	In terms of current land use there is a football stadium near one of the southern locations. However underneath the panels is proposed to be used for parking hence can be seen to add value to existing land and thus can be seen as a positive impact.  No schools, hospitals or mosques at or around any of the proposed locations, even when future land use is considered.
22	Are there any Defence Installations / Airport Routes		<b>No</b>	<b>N/A</b>	No such installations nearby. Closest airport which is being developed in a separate island is about 05 km south west of Hinnavaru.
23	Are there any areas on or around the location which contain important, high quality or scarce resources e.g. groundwater, surface waters, forestry, agriculture, fisheries, tourism, minerals, which could be affected by the project?		<b>No</b>	<b>N/A</b>	The land is reclaimed hence no such areas present
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?		<b>No</b>	<b>N/A</b>	No such areas exist within or in close proximity to the site.
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.		<b>No</b>	<b>N/A</b>	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 Island Waste Management Center (IWMC) and their on forth the Regional Waste Management Facility in Vandhoo.
<b>Section B: Specific Screening Questions on Floating Solar</b>					

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	Will the project create significant/ limited/ no social impacts? If so please provide details of what they will be.	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 92.5% of the survey respondents suggesting the project will be very beneficial. In terms of location 82.9% of the survey respondents were happy with the location.</p> <p>In terms of issues raised regarding the location near the revetment one respondent highlighted as the site is close to the coast the area is not ideal. Another respondent highlighted it would be better to use the harbor area of the island. Other than this no other comments were received from the public regarding the location (Annex 4).</p> <p>As project is undertaken in a land area very few activities are undertaken, not much social issues are anticipated to arise from this project.</p> <p>Thus, overall the impacts can be seen as limited and mostly positive.</p>
2	Land acquisition resulting in loss of income from		No	N/A	The project does not involve acquiring land that is reserved for any other purpose. The areas have been designated as PV

	agricultural land, plantation or other existing land-use.				installation areas in land use plans of the islands.
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> <p>No gender specific issues were identified by any survey respondents during the survey. It is noticeable that more women respondent to the survey than men in Hinnavaru (Annex 4).</p>
7	Will the project create significant / limited / no Social impacts during the construction stage?	Yes		Moderate	Risks already covered in section A question 8.
<b>Section D: Impacts of Construction</b>					
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 7

3	Will the activity lead to elevated noise and dust emission?	Yes		Low	<p>Considering the scale of works will be very limited and no nuances to public due to the land being barren. Noise generated will be mostly due to operation of installation machinery and from batching plant.</p> <p>Dust will mostly be generated during concrete mixing process.</p>
4	Will project activities lead to disruption to traffic movements	Yes		Low	Some disruptions may occur during interconnection cable laying.
5	Will project activities lead to damage to existing infrastructure, public utilities, amenities etc.	Yes		High to Moderate	As the project involves digging and certain amount of cable laying, during construction phase possibility of chance 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		Moderate to low	<p>The following issues may arise:</p> <ul style="list-style-type: none"> <li>• As highlighted accidental damages to cables and utility lines may occur. This may lead to disruption of service to public.</li> <li>• Conflicts may occur if any human health impacts occur to the public due to negligence of construction work force.</li> <li>• Moreover, especially if foreign work force is involved conflicts may occur with local community.</li> <li>• The Labour Management Procedures developed for the</li> </ul>

					project needs to be followed to address these issues (link: <a href="https://www.environment.gov.mv/v2/en/download/10026">https://www.environment.gov.mv/v2/en/download/10026</a> ).
7	Are there adequate facilities for storage of construction goods & materials	Yes		Low	Hinnavaru is an island with ample reclaimed land which is currently not utilized, hence the council can accommodate for construction workforce and material storage. As per the council currently also land for short term construction mobilization is provided from reclaimed land.
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	For a facility like this not much operational staff is required. The investor will be encouraged to employ local staff for the project. In this regard it is a requirement to give preference to local staff.  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.
10	Will the construction works (Permanent & Temporary) lead to alterations of the site	Yes		Moderate	The works will involve installation of permanent ground mounted PV panels. Moreover, temporary digging is involved during construction phase.
11	Are facilities for construction workers (temporary labour camp, drinking water, waste disposal, etc.) required during implementation	Yes		Moderate	The council suggested that most temporary labour camps are based in the reclaimed area of the island and a space from this area can be given for project purposes if needed. An alternative according to council is to use rental properties within the island to house labour force.  For labour camps some environmental and social risks that are involved can be summarized as below: <ul style="list-style-type: none"> <li>• Lack of sanitation and clean drinking water at the project site.</li> <li>• Over congestion of work force in a small space can lead to disease and other such outbreaks. Often</li> </ul>

					<p>foreign labours in Maldives are housed by contractors in unhygienic and inhumane conditions.</p> <ul style="list-style-type: none"> <li>• Lack of access to shower facilities.</li> <li>• Food being served in unhygienic conditions.</li> <li>• Lack of availability of adequate meals.</li> <li>• Lack of clearly demarcated designated areas for waste disposal can lead to unhygienic living/working environment which can lead to disease etc.</li> <li>• 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.</li> <li>• Pest infestation in the work space and living quarters can lead to unhygienic working/living conditions and can lead to serious disease outbreaks.</li> <li>• If foreign labour is involved social conflicts with the community due to differences in culture.</li> <li>• If project is undertaken during Covid 19 situation, chance of transmission of Covid from the workforce to the community.</li> </ul>
12	Are facilities for disposal of solid waste available on the Island- please specify the forms in the comments	Yes		Moderate	An operational Island Waste Management Centre (IWMC) is there right adjacent to one of the PV installation sites. 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 the nearest regional waste management facility

					for disposal (Construction waste currently accepted at Thilafushi facility only).
<b>Section E: Cumulative Impacts</b>					
1	Cumulative effects due to proximity to other existing or planned projects with similar impacts	<b>Yes</b>		<b>Moderate</b>	<p>Lot of new developments likely to occur in the newly reclaimed land within the next couple of years. Hence in terms of ongoing constructions it can be expected that parallel projects will be running.</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>

### 8. Project operating requirements

		<b>Yes</b>	<b>No</b>
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"> <li>1. MOU signed with council confirming the location</li> <li>2. Ministry of Planning Housing and Infrastructure/ Maldives Land Survey Authority provided the Landuse approval</li> </ol> <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><b>An indicative mitigation plan to the identified risks are provided in Annex 9</b></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
	Potential adverse impacts are significant, hence project cannot be justified



## 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:** 23<sup>rd</sup> December 2020

**Signature:**



### Screening report reviewed by:

**Name and Designation:** Maumoon Khalid, Project Manager

**Date:** 23<sup>rd</sup> December 2020

**Signature:**



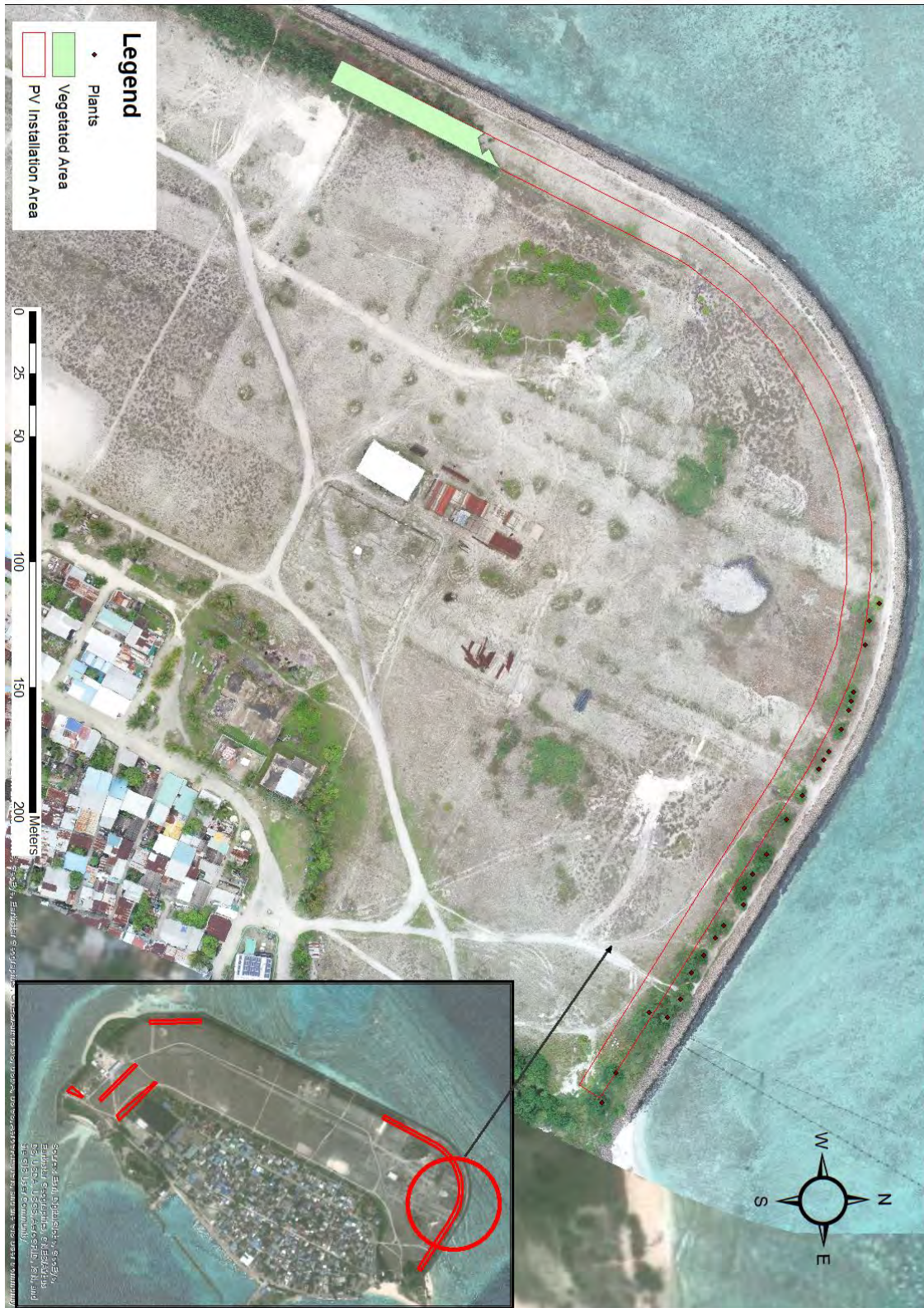
**Approved by:** (Approved by World Bank through email)

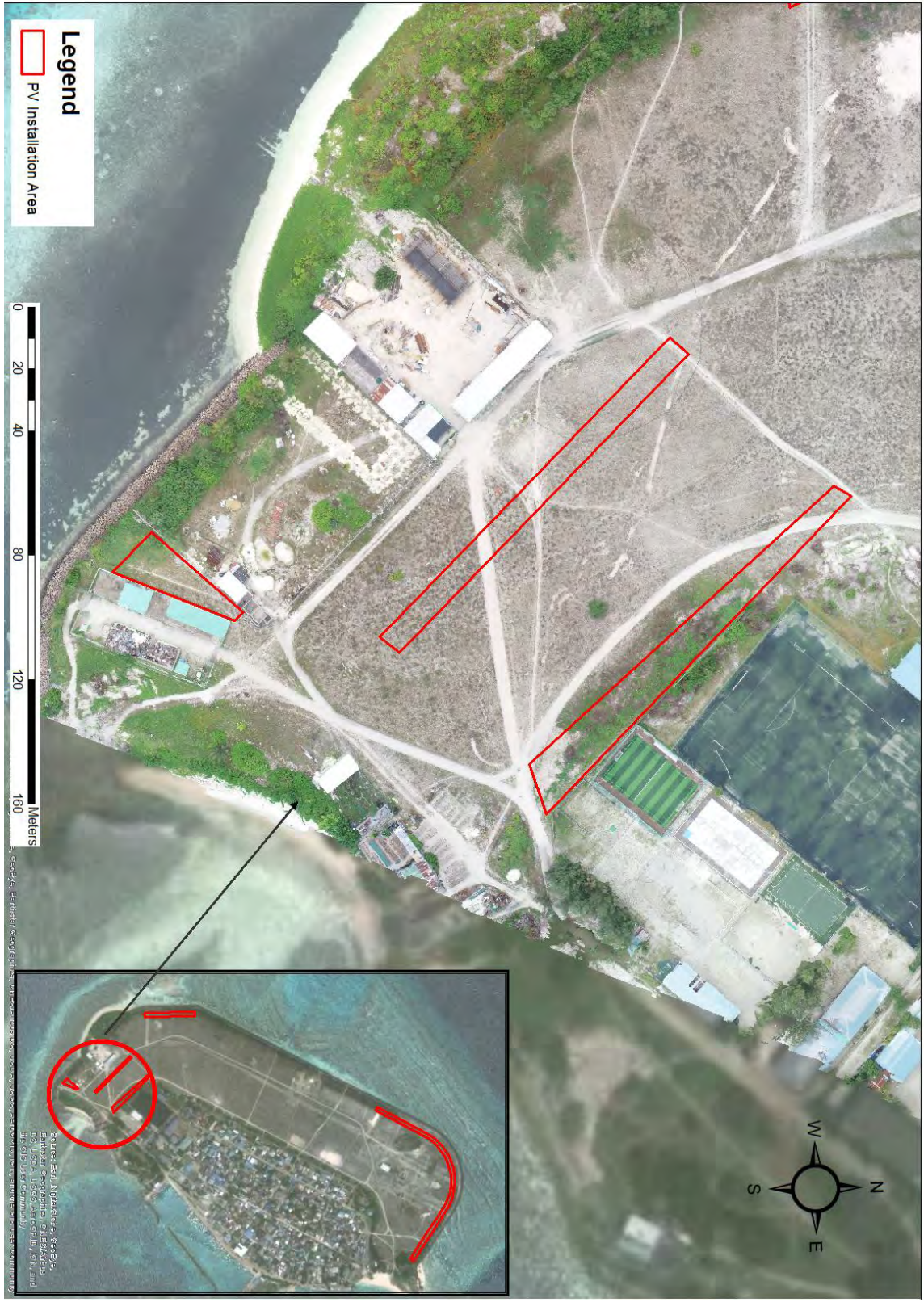
**Name and Designation:**

**Date:**

**Signature:**

## 2 Annex 1: Location Map







## 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.

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

- 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 1MW of Solar PV outside of the ring road of Hinnavaru. The project is planned to be implemented in the reclaimed land of Hinnavaru. The project will be implemented by an investor selected through a bidding process. Figure 1 shows the map of solar installation site. An area of 8586 m<sup>2</sup> will be utilized for the purpose of this project (Figure 1). The ground mounted solar panels will be installed in several locations in the reclaimed land of Hinnavaru.

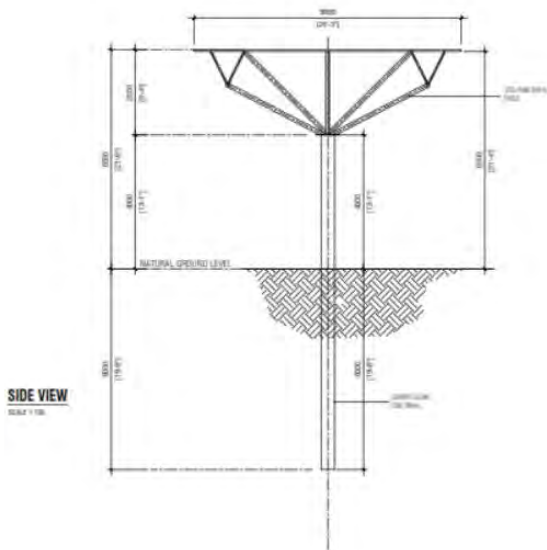


Figure 1 Solar Installation Locations Hinnavaru

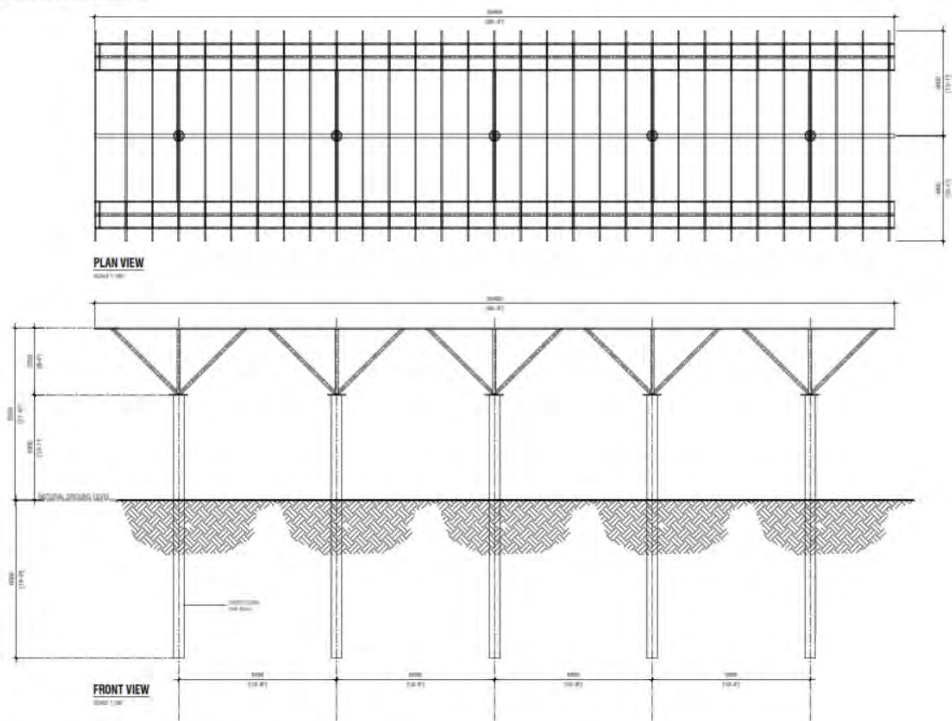
### 3.3 General Method Statement for construction

#### 3.3.1 Installation of PV Structure (Concept)

##### **HINNAVARU PV ARRAY CONCEPT**



### HINNAVARU PV ARRAY CONCEPT



Note: This concept is only for the northern section near the revetment. Other concepts are in the process of being developed by the civil engineer at the time of this screening.

#### 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. The exact method of construction will be determined by the selected investor for the project. The method described here is pad footing method. Screw piling maybe another method that maybe adopted for the project.

#### 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- Steel pile foundation or Pad footings (pad footing method described here)
- 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).

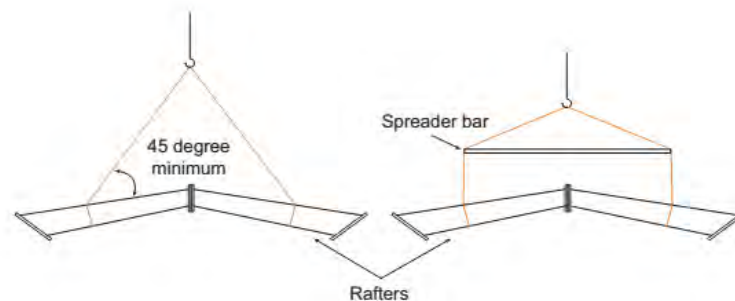


Figure 5. Hoisting cables.

### 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.

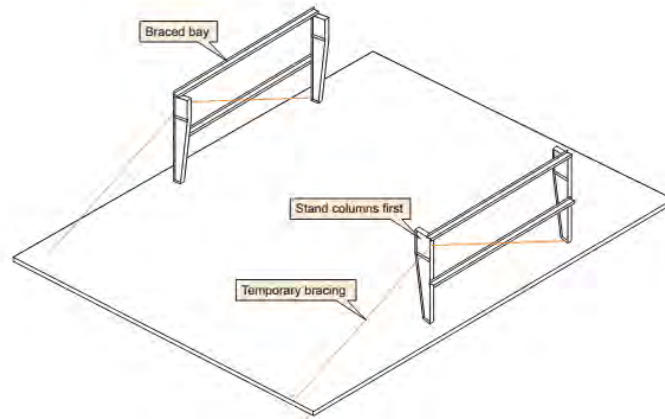


Figure 6. Bay erection and temporary bracing.

### 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 Hinnavaru. The preliminary interconnection route is provided in the figures below.



FIGURE 7 INTERCONNECTION ROUTE HINNAVARU NORTHERN SITE



FIGURE 8 INTERCONNECTION ROUTE SOUTHERN SITES

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;

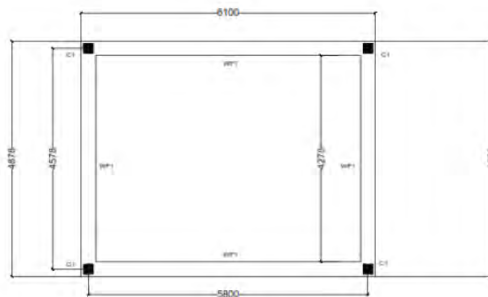
CAUTION CAUTION CAUTION

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

Transformers will likely be placed in each of the solar PV installation sites. The transformer will be placed in a hut of dimensions 20 feet by 16. Engineering drawings of the hut are given below.



Foundation Details



The transformer hut will be built 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 and will be locked at all times.
  - Appropriate warning signs will be displayed outside of the transformer hut.

## 4 Annex 3: Council meeting Minutes

<b>Subject:</b>	<b>Council Consultation regarding public survey regarding ARISE project interventions</b>
<b>Date:</b>	July 7, 2020
<b>Location:</b>	Online
<b>Start Time:</b>	10:00
<b>End Time</b>	10:30
<b>AGENDA ITEMS</b>	
<ul style="list-style-type: none"><li>• Survey to be disseminated to public</li><li>• Queries on the project</li><li>• Update on land use approval from Planning ministry</li></ul>	
<b>DISCUSSION POINTS</b>	
<ul style="list-style-type: none"><li>• A brief introduction was given on the purpose of the survey and Ministry of Environment (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.</li><li>• 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.</li><li>• ME requested the Council to request Ministry of National Planning, Housing and Infrastructure (MoNPHI) to get approval for the Land Use plan of the island with the solar installation sites included. Council directed to send a letter stating the same.</li></ul>	
<b>OUTCOMES</b>	
<ul style="list-style-type: none"><li>• Council to share the survey on Council Facebook page and online community groups.</li><li>• ME to send a letter to Council requesting the Council to get approval on land use plan from MoNPHI</li><li>• Council to get approval from MONPHI for land use plan.</li></ul>	



**Attendees Information List:**

#	Institution	Name	Designation	Email
1	Secretariat of Hinnavaru Council	Abdulla Ibrahim	President	<a href="mailto:Ab.badhaas@gmail.com">Ab.badhaas@gmail.com</a>
2	Secretariat of Hinnavaru Council	Adhuma Mohamed Faariq	Project Officer	<a href="mailto:Adhumafariq92@gmail.com">Adhumafariq92@gmail.com</a>
3	Secretariat of Hinnavaru Council	Fathimath Rizna	Project Officer	fathmathrixna@gmail.com
4	Ministry of Environment	Hamdhaan Zuhair	ESS Specialist	hamdhaan.zuhair@environment.gov.mv
5	Ministry of Environment	Nuzhath Ahmed	Project Coordinator	<a href="mailto:nuzhath.ahmed@environment.gov.mv">nuzhath.ahmed@environment.gov.mv</a>
6	Ministry of Environment	Ifaadh Waheed	Communications Officer	<a href="mailto:ifaadh.waheed@environment.gov.mv">ifaadh.waheed@environment.gov.mv</a>
7	Ministry of Environment	Aminath Hanaan Mohamed	Monitoring and Evaluation Officer	<a href="mailto:aminath.hanaan@environment.gov.mv">aminath.hanaan@environment.gov.mv</a>

## 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 Lh. Hinnavaru under Accelerating Renewable Energy Integration and Sustainable Energy (ARISE) project funded by the World Bank and other development partners. The key activities planned for Hinnavaru are as follows:

1. Solar PV installation for 01 MW PV
2. Battery Energy Storage System (BESS) Installation of 03 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.

The survey was undertaken to fulfil 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 Island Characteristics

Hinnavaru is administrative capital of Lhaviyani atoll. Located north-east of the atoll with geographic coordinates of 5°29'35.85"N, 73°24'46.07"E. The resident population of Hinnavaru predicted for 2020 is 2683 based on Maldives Population Prediction 2014 to 2054. This includes 1337 Males and 1345 Females. Like many other islands selected for the project Hinnavaru also has significant reclaimed land, total land area of Hinnavaru is 53 ha of which around 50 percent is reclaimed. The island is around 5 kilometers from the new domestic airport being built in Madivaru.

There are no salient environmental features that are of significance in Hinnavaru. In terms of history and culture like some other islands in Lhaviyani atoll, the roads and households of Hinnavaru are unique, in this regard very narrow streets with living quarters in one side of the road and kitchen in other side of the road are the norm in some older households.

### 5.2 Methodology

#### 5.2.1 Data Collection

A conference call was held with the island council on 07<sup>th</sup> 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)  
<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](http://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.

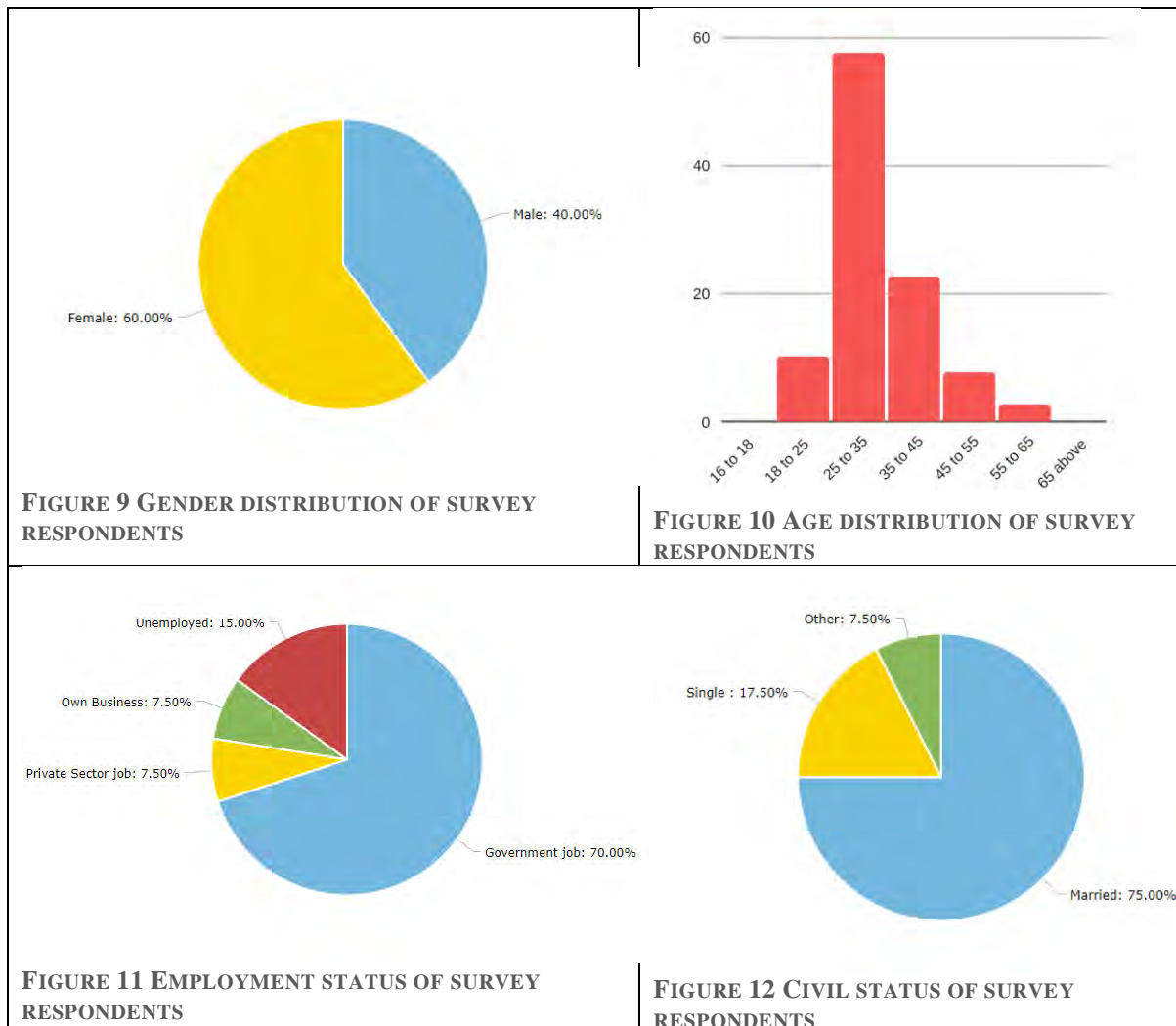
Cost of electricity per person was calculated by dividing the average bill information provided by the respondents by the number of persons in the household.

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

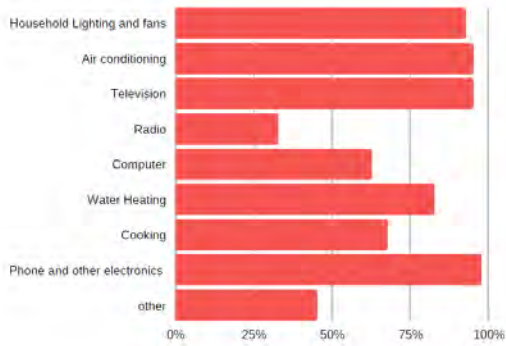
### 5.3.1 General characteristics



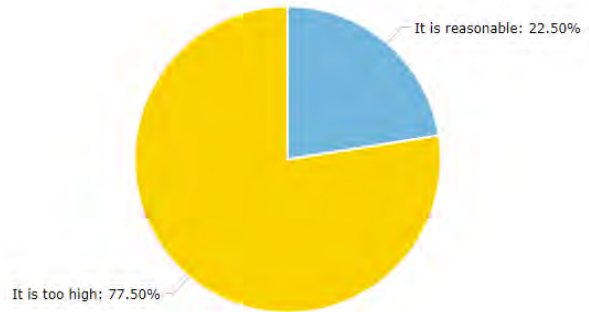
A total of 42 responses were received from Hinnavaru for the survey. This represents around 1.56% of the registered population. Unlike other islands majority of respondents of Hinnavaru were women, in this regard 60% of the survey respondents were women and 40% men (Figure 1).

Majority of the respondents are youth of the island with 25 to 35 years being the dominant age group (Figure 2). 75 % of those who are surveyed are married figure 4. In terms of employment the majority of those who are surveyed are employed (85%). In terms of sector of employment, the majority of the respondents were government sector employees, with 50% of survey respondents (Figure 3).

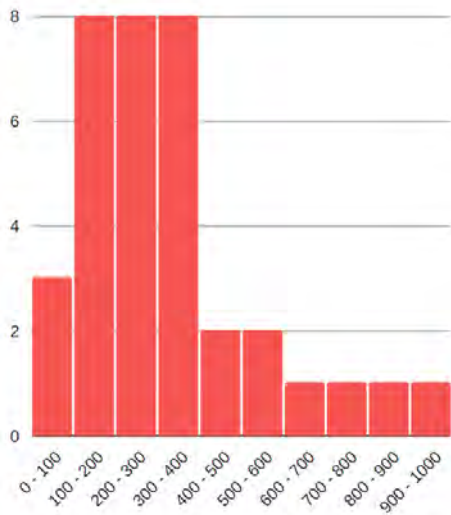
### 5.3.2 Electricity usage and reliability



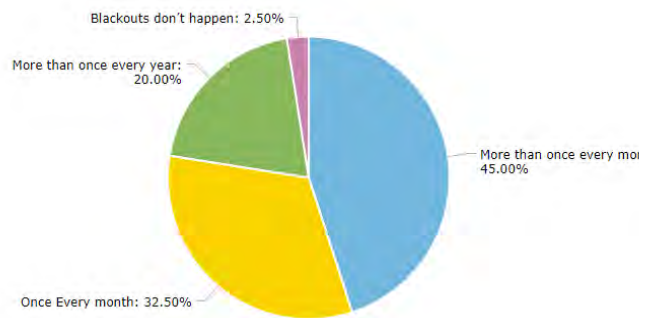
**FIGURE 13 HOUSEHOLD USAGE OF ELECTRICITY**



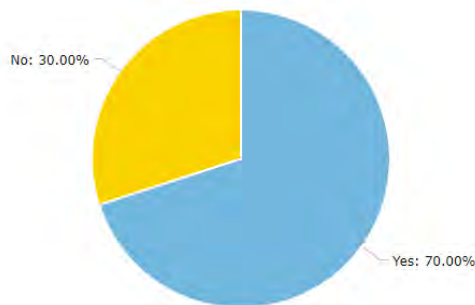
**FIGURE 14 VIEW ON PRICE OF ELECTRICITY**



**FIGURE 15 COST OF ELECTRICITY PER UNIT HEAD**



**FIGURE 16 FREQUENCY OF BLACKOUTS**

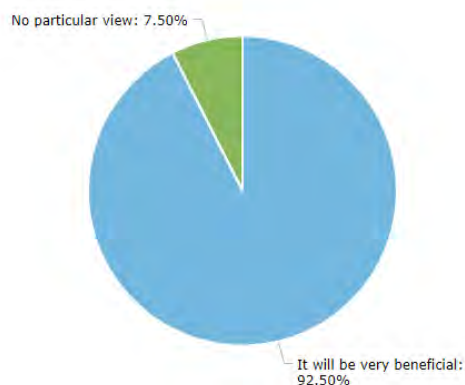


**FIGURE 17 DAMAGE TO ELECTRICAL APPLIANCES DUE TO BLACKOUTS**

This section presents the results from questions 6 to 11 (Annex 1) of the survey. As seen on Figure 5 household lighting, fans, air condition, television, water heating and charging electronic devices is the main aspects to which electricity is used in the households of Hinnavaru. More than 70% of survey respondents use these aspects for electricity (Figure 5). In addition, more than 50% of the respondents use electricity for cooking and computer systems (Figure 5). 77.5% of the respondents believe that the existing price of electricity is too high (Figure 6). On average per head MVR 100 to MVR 400 is spent on electricity on a monthly basis (Figure 7). In terms of blackouts 45% of the survey respondents suggested that electricity goes more than once every month (Figure 8). 70% 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.



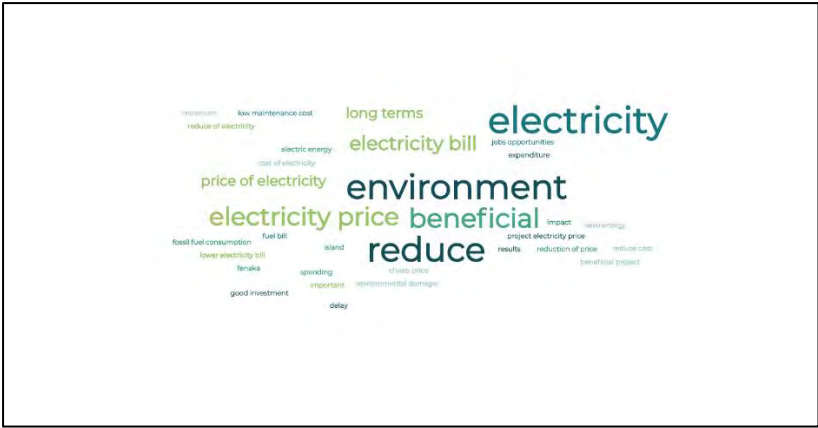
**FIGURE 18 BENEFITS OF SOLAR PV**

92.50% of those who were surveyed identified that the Solar PV installation undertaken through the project will be very beneficial (Figure 10). Rest of the respondents had no view on this component of the project (Figure 10). It is noticeable that unlike all other islands, there was not even a single survey respondent that thought that PV installation component is not 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”, “price of electricity”, “environment” and “beneficial” 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

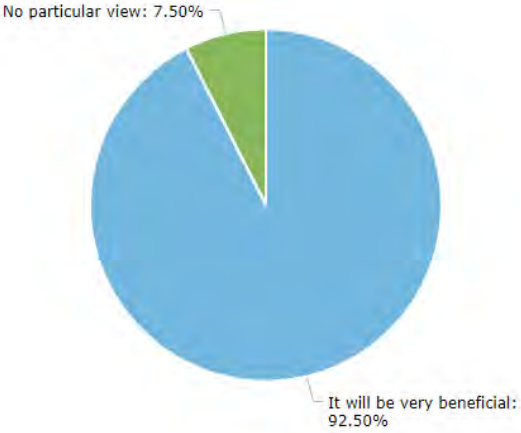
As electricity is provided by a huge fuel subsidy the aim of the government is to reduce this subsidy through projects like this with the long-term aim of reducing the price of electricity. An immediate change in price in electricity may not occur as a result of the project, thus through the various 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.



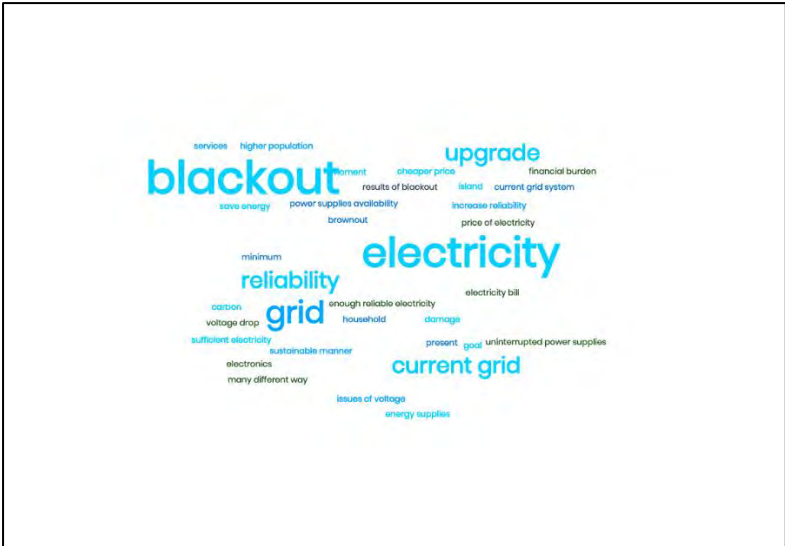
**FIGURE 19 RESULTS OF THE WORD-CLOUD ANALYSIS UNDERTAKEN FOR HINAAVARU SOLAR PV**

Regarding grid upgradation works again the majority of the respondents, 92.50%, identified that it will be very beneficial (Figure 12). Rest of the respondents had no view on this component of the project (Figure 12). It is noticeable that unlike all other islands there was not even a single respondent that thought that the grid upgradation component is not beneficial.

The main expected benefits of grid upgradation as identified through text cloud analysis include resolution of blackout issues and provide more reliable electricity to the island (Figure 13). Moreover, some respondents, similar to solar PV, again identified the expectation that the price of electricity will reduce (Figure 13).

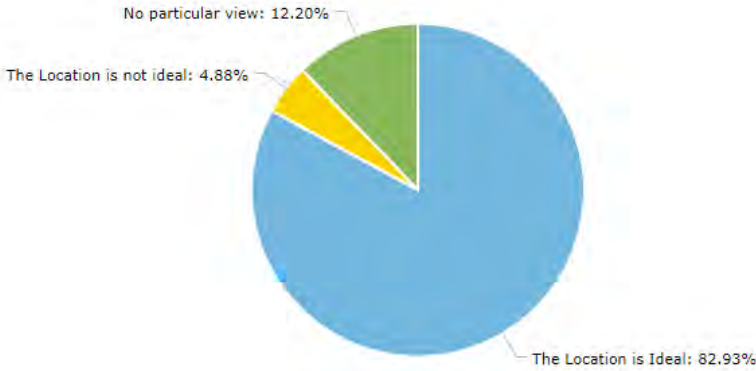


**FIGURE 20 BENEFITS OF GRID UPGRADATION**



**FIGURE 21 RESULTS OF WORD CLOUD ANALYSIS UNDERTAKEN FOR HINAVARU, GRID UPGRADATION**

The next question in the survey is regarding the location of Solar PV installation. 82.93% of those who were surveyed were happy with the location of the PV installation site and 12.20% of individuals did not have any view on the location (Figure 14). Only two respondents (4.88%) highlighted the location is not ideal. One respondent highlighted that as it is beach area it is not an ideal location. Another highlighted that harbor location will be a better option.

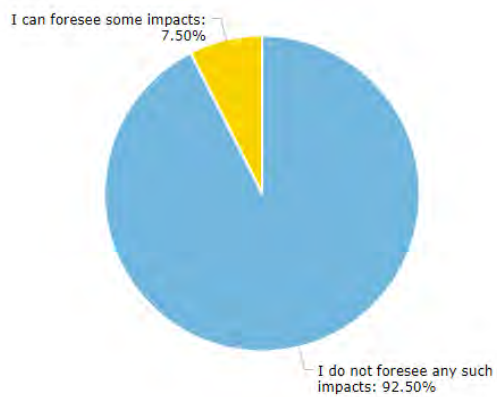


**FIGURE 22 PERCEPTION REGARDING SOLAR PV INSTALLATION LOCATION**

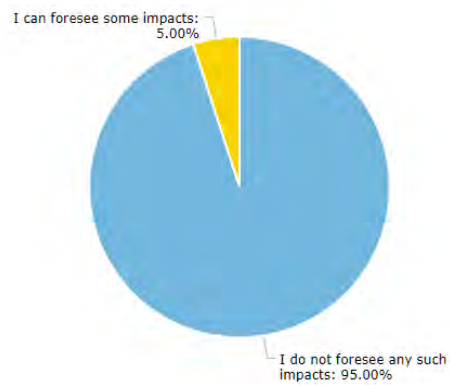
### 5.5 Perception on Environment and Social Impacts

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 36 of the survey. Figures below present the outcomes of the survey.

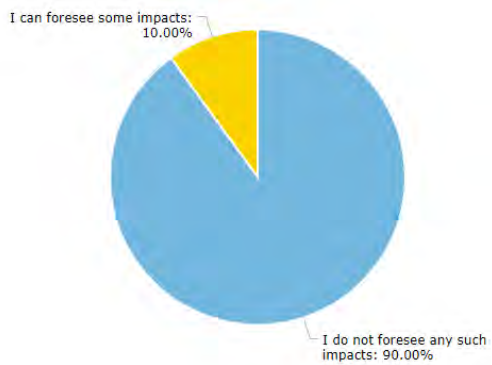




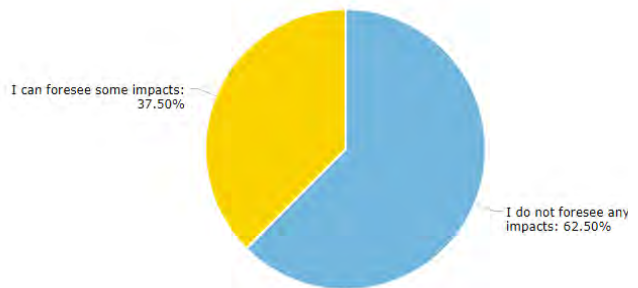
**FIGURE 23 POTENTIAL IMPACTS ON PUBLIC AND PRIVATE PROPERTY AS A RESULT OF THE PROJECT**



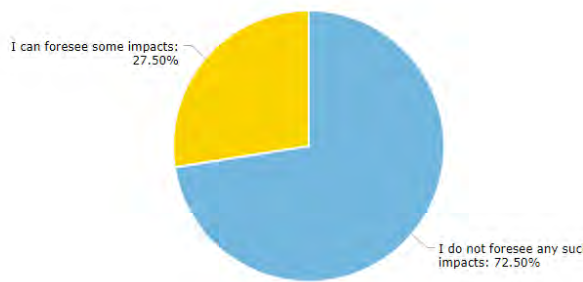
**FIGURE 24 POTENTIAL IMPACTS ON THE LIVELIHOOD AS A RESULT OF THE PROJECT**



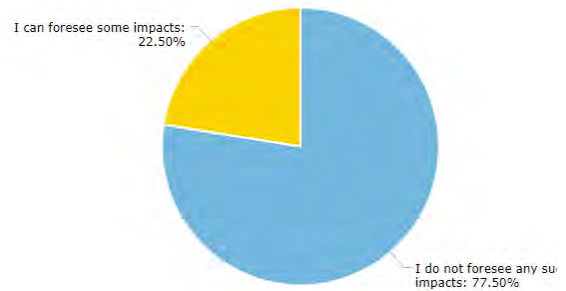
**FIGURE 25 POTENTIAL IMPACTS ON SAFETY**



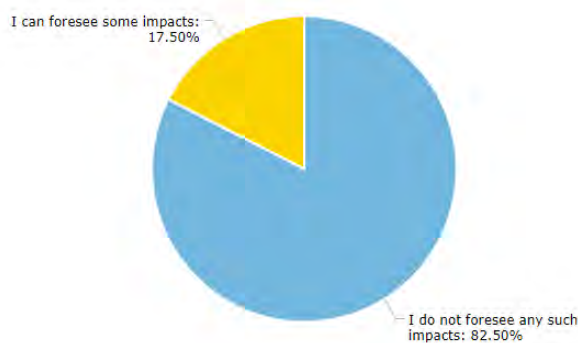
**FIGURE 26 POTENTIAL IMPACTS RELATED TO LABOUR FORCE**



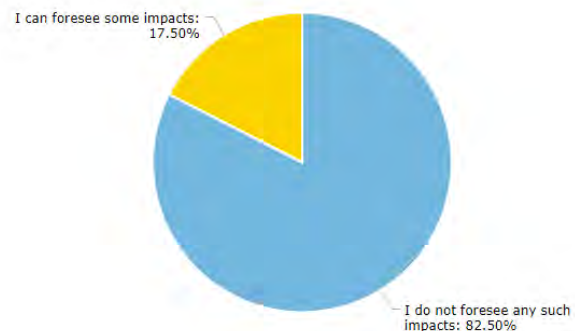
**FIGURE 27 POTENTIAL IMPACTS RELATED TO VIBRATION, NOISE AND DUST**



**FIGURE 28 POTENTIAL IMPACTS ON TRAFFIC**



**FIGURE 29 POTENTIAL IMPACTS ON VEGETATION**



**FIGURE 30 POTENTIAL IMPACTS ON GROUNDWATER**

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.

<b>Aspect</b>	<b>Raised Issue or Concern</b>
Impacts on property	➤ One respondent highlighted that it might limit landuse for other purposes
Impacts on livelihood	➤ No specific issues highlighted by any of the respondents
Impacts on Safety	➤ No specific issues highlighted by any of the respondents
Impacts of labour Force	<ul style="list-style-type: none"> <li>➤ Three respondents raised the importance of using local labour for project activities.</li> <li>➤ Conflicts of foreign labour with local community was raised by four respondents</li> </ul>
Impacts on noise, vibration and dust	➤ One respondent highlighted that as close to coastal protection there is possibility of damage to coastal protection structure and sand seeping to the sea from the reclaimed area.
Impacts on traffic	<ul style="list-style-type: none"> <li>➤ Three respondents highlighted that traffic disruption can occur while working on roads</li> <li>➤ One respondent highlighted that width of existing roads of Hinnavaru are very narrow</li> </ul>

	hence, any work undertaken in roads will make it difficult to public.
Impacts on vegetation	<ul style="list-style-type: none"> <li>➤ One respondent highlighted that casuarina trees found in the reclaimed area needs to be relocated</li> <li>➤ One respondent highlighted when PV panels are installed no plants can grow underneath</li> </ul>
Impacts on groundwater	<ul style="list-style-type: none"> <li>➤ One respondent suggested that water may become salty due to extraction</li> <li>➤ One respondent suggested that water may become polluted due to construction material used</li> </ul>

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:

<b>Impacts</b>	<b>Mitigation Measres</b>
Impacts on land use	<ul style="list-style-type: none"> <li>• Underneath the panels can be used it will not be enclosed, hence planned land use can be permitted. Council suggested that they plan to use the area to develop a tourist beach.</li> </ul>
Impacts on coastal protection	<ul style="list-style-type: none"> <li>• The footings will be installed away from the coastal protection structure to avoid any damages.</li> </ul>
Involvement of Locals in the labour force	<ul style="list-style-type: none"> <li>• Local staff of Fenaka will be involved in operation and maintenance of Battery Energy Storage System (BESS)</li> <li>• Exposure visits and awareness campaigns undertaken for locals.</li> <li>• Local staff from Fenaka will be involved in Environmental and Social inspection during construction and operation phase.</li> <li>• Investors that install solar PV will be encouraged to utilize local staff during operation and maintenance phase</li> </ul>
Conflicts with local community	<ul style="list-style-type: none"> <li>• The workers will need to be briefed on local customs and traditions using the language of the construction work force.</li> <li>• A dedicated staff of the contractor/investor will need to be assigned to address the any potential grievances as per the GRM of the project (see Annex 8)</li> </ul>
Traffic impacts	<ul style="list-style-type: none"> <li>• If for any reason the road needs to be closed the following mitigation measures will be observed: <ul style="list-style-type: none"> <li>• Road closures will be coordinated with police and the council.</li> <li>• Appropriate safety signs will be installed.</li> <li>• Aim to finish construction works as per the schedule.</li> </ul> </li> <li>• No equipment should be left unattended in a manner it will disrupt traffic of the road.</li> <li>• All equipment and material need to be stored in designated location.</li> </ul>

Vegetation impacts	<ul style="list-style-type: none"> <li>• The PV panels are located away from the casuarina trees found in the reclaimed land so relocation of these trees is not anticipated.</li> <li>• Underneath the panels coastal vegetation will be accommodated</li> </ul>
Groundwater contamination	<ul style="list-style-type: none"> <li>• If dewatering is required dewatering permit needs to be attained and works need to be completed within the shortest possible time.</li> <li>• 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.</li> <li>• Stored containers should be regularly inspected to identify any leakages.</li> <li>• The storage for any hazardous material and any refueling activities should be undertaken outside the 20m Environmental Protection Zone of the island.</li> <li>• All vehicle/machinery and equipment operation, maintenance and refueling will be carried out in such a way that spillage of fuels and lubricants does not contaminate the ground.</li> </ul>
Impacts on Noise, vibration and dust	<ul style="list-style-type: none"> <li>• Restricting working hours from morning 06 to evening 06.</li> <li>• Keeping construction equipment properly stored and secured at a location approved by the council</li> <li>• 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.</li> <li>• Ensure that the construction site is wetted regularly to minimize impact of dust as a result of the project.</li> </ul>

## 5.6 Conclusion

Based on the survey results, overall it can be seen that the public of Hinnavaru are very keen and positive regarding the project. With 92.5% of the surveyed public suggesting that the interventions planned through the project are beneficial. The text analysis done identified inherent environmental benefits of Solar installation 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 expectation of attaining a more reliable electricity supply.

In terms of location, 92.50% of the survey respondents are happy with the location. Similarly, in terms of impacts, issues raised regarding labour force, traffic, vegetation and groundwater can be adequately addressed through the proposed mitigation measures

## 5.7 Translated 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.

### Location of Solar PV Installation at (island name)

Map attached here

### 3D Visual of the location at which solar PV is installed (island name)

Attach Visual here

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 03 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 week or two.

**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 question 16 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

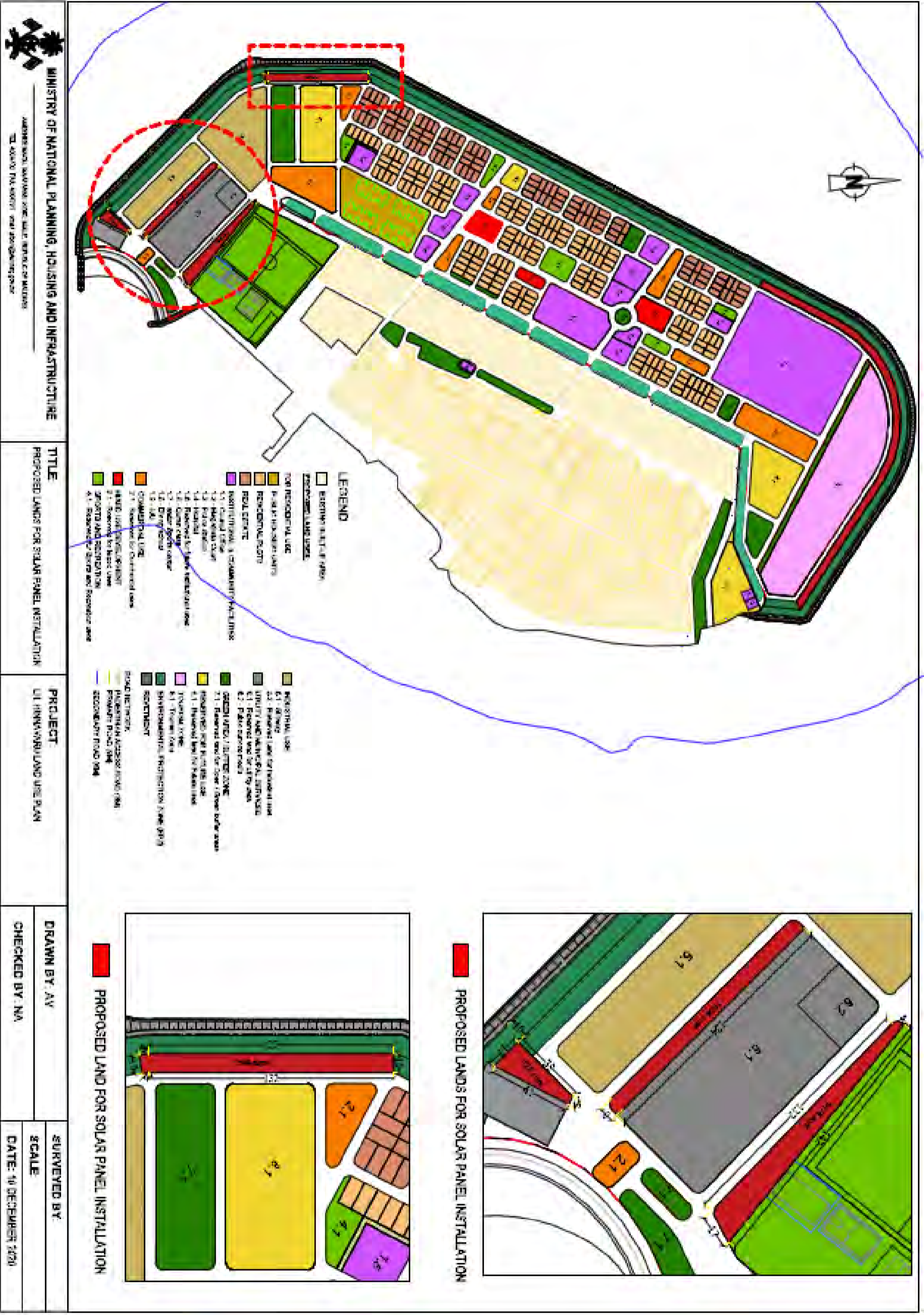
35. If you answered I can foresee some impacts in question 34 could you briefly describe the impact

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

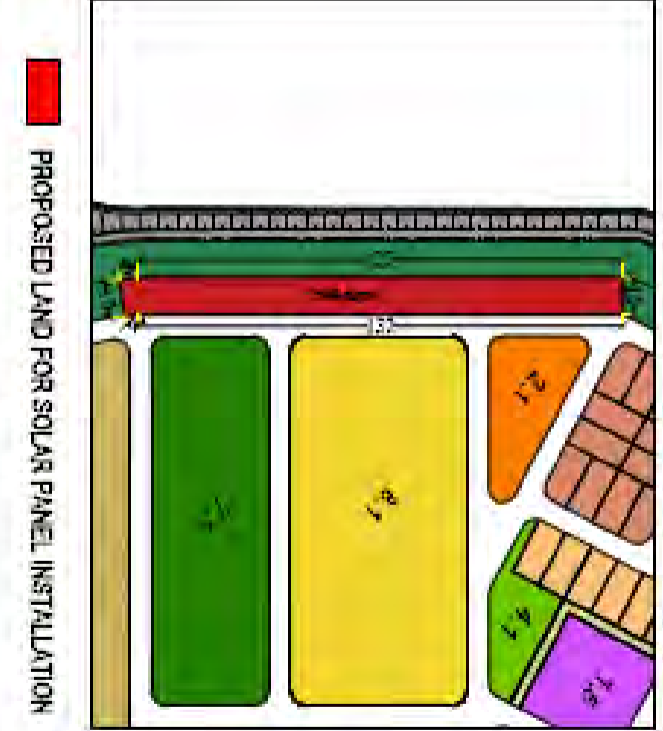
36. If you could foresee any other negative impacts as a result of this project please describe briefly below

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

## 6 Annex 5: Landuse Plan of Hinnavaru



- LEGEND**
- EXISTING BUILT-UP AREAS
  - PROPOSED LAND USES
    - TOP RESIDENTIAL USE
      - P-1 - Residential Units
      - P-2 - Residential Units
      - P-3 - Residential Units
    - RECREATIONAL USES
      - R-1 - Recreation
      - R-2 - Recreation
      - R-3 - Recreation
    - INDUSTRIAL & COMMERCIAL USES
      - I-1 - Industrial
      - I-2 - Industrial
      - I-3 - Industrial
      - I-4 - Industrial
      - I-5 - Industrial
      - I-6 - Industrial
      - I-7 - Industrial
      - I-8 - Industrial
      - I-9 - Industrial
      - I-10 - Industrial
      - I-11 - Industrial
      - I-12 - Industrial
      - I-13 - Industrial
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      - I-27 - Industrial
      - I-28 - Industrial
      - I-29 - Industrial
      - I-30 - Industrial
      - I-31 - Industrial
      - I-32 - Industrial
      - I-33 - Industrial
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      - I-48 - Industrial
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      - I-50 - Industrial
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      - 1 - Road
      - 2 - Road
      - 3 - Road
      - 4 - Road
      - 5 - Road
      - 6 - Road
      - 7 - Road
      - 8 - Road
      - 9 - Road
      - 10 - Road
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      - 99 - Road
      - 100 - Road





PROPOSED LAND FOR SOLAR PANEL INSTALLATION AREA= 5485 sqm

- LEGEND**
- EXISTING BUILT-UP AREA
  - PROPOSED LAND USES:**
    - FOR RESIDENTIAL USE
    - PUBLIC HOUSING UNITS
    - RESIDENTIAL PLOTS
    - REAL ESTATE
    - INSTITUTIONAL & COMMUNITY FACILITIES
      - 1.1 - Council Office
      - 1.2 - Magistrate Court
      - 1.3 - Police station
      - 1.4 - Hospital
      - 1.5 - Reserved for future institutional uses
      - 1.6 - Quran class
      - 1.7 - water sports center
      - 1.8 - Diving school
      - 1.9 - JUU
    - COMMERCIAL USE
      - 2.1 - Reserved for Commercial uses
    - MIXED USE DEVELOPMENT
    - SPORTS AND RECREATION
      - 3.1 - Reserved for Mixed Uses
      - 4.1 - Reserved for Sports and Recreation uses
  - INDUSTRIAL USE
    - 5.1 - Shipway
    - 5.2 - Reserved Land for Industrial uses
  - UTILITY AND MUNICIPAL SERVICES
    - 6.1 - Reserved land for Utility uses
    - 6.2 - Public service media
  - GREEN AREA / BUFFER ZONE
    - 7.1 - Reserved land for Open / Green buffer areas
    - 7.2 - Reserved land for Future Use
  - TOURISM ZONE
    - 8.1 - Reserved land for Future uses
    - 8.1 - Tourism Zone
  - ENVIRONMENTAL PROTECTION ZONE (EPZ)
    - 9.1 - Tourism Zone
  - REVENUEMENT
- ROAD NETWORK**
- PEDESTRIAN ACCESS ROAD (3M)
  - PRIMARY ROAD (9M)
  - SECONDARY ROAD (6M)



**MINISTRY OF NATIONAL PLANNING, HOUSING AND INFRASTRUCTURE**

AMBENGE MAJULI, MAJUPANNU 20921, MALÉ, REPUBLIC OF MALDIVES  
 TEL: 4004700 FAX: 4004701 email: uen@npp.gov.mv

**TITLE:**  
 PROPOSED LAND FOR SOLAR PANEL INSTALLATION

**PROJECT:**  
 LH: HINNAYARU LAND USE PLAN

**DRAWN BY:** AV

**CHECKED BY:** NA

**SURVEYED BY:**

**SCALE:**

**DATE:** 5 OCTOBER 2020

## 7 Annex 6: Land Approval Letter Translation

[Unofficial Translation]

Maldives Land and Survey Authority  
Ministry of National Planning, Housing and Infrastructure  
Male', Republic of Maldives  
Reference No.: 431-VR/326/2020/9

To: President of Faadhippolhu Hinnavaru Council, Mr. Abdullah Ibrahim

With reference to Council Letter No. 14/2020/471/326, dated 21<sup>st</sup> July 2020, please note;

The land area suggested for solar PV installation in the referenced letter is an area marked as a E.P.Z in the islands' land use plan. As a general rule land areas issued as E.P.Z near revetments are of 10 meters. However, the Land Use Plan of Hinnavaru was passed with 20 meters of land as EPZ near the revetment in reclaimed area. In addition, there are no lands of sufficient size for solar installation on the island given the plan of the reclaimed and the zoning done for various purposes thereto. Therefore, we approve a land area of 5485 square feet (decreased form the requested 6628 square feet land area) for solar installation near the revetment after leaving 10 meters of land area for EPZ, as described in the drawing attached with this letter. In addition, please keep height of 4.5 meters in the pole on which the soalr PV is to be ground mounted.

Additionally since this land is being issued for a period exceeding o6 months, the land should be issued after obtaining approval from the Local Government Authority in accordance with Article 4 (c) of the Law No.:5/2020 (Special Act on ensuring Decentralization 2020) and as prescribed in Regulation No.:2018/R-69 (Regulation on Issuing Land for Non-Residential Purposes).

With Respect,

20 Safar 1441,

07 October 2020

Sincerely,

[Signature]

Mohamed Shafi

Director General

Secretariat of Faadhippolhu Hinnavaru Council

Lh. Hinnavaru, Maldives,

Copy: Secretariat of Faadhippolhu Atoll Council

Maldives Land and Survey Authority  
Ministry of National Planning, Housing and Infrastructure  
Male', Republic of Maldives  
Reference No.: 431-LIS/326/2020/10

To: President of Faadhippolhu Hinnavaru Council, Mr. Abdullah Ibrahim

With reference to Council Letter No. 1/2020/471/326, dated 4<sup>th</sup> November 2020 and the Letter No. 22/2020/471/326, dated 9<sup>th</sup> November 2020, please note;

With respect to development of solar PV system in Lh. Hinnavaru , under Accelerating Renewable Energy Integration and Sustainable Energy (ARISE), please note the following;

We approve the issuing the, 1475 square meter land area, and the 1034 square meter land area, and 426 square meter land area, and 1364 square meter land areas specified in the map attached with this letter for solar installation.

In addition, when installing solar panels on the road the design should be at least 4 meters high and in such away as not to impede the vehicles using the road. And if the panels are being installed in areas where the land has been issued for a specific purpose, please obtain non-objection from the party to whom the land has been issued to.

Additionally since these lands are being issued for a period exceeding 06 months, the land should be issued after obtaining approval from the Local Government Authority in accordance with Article 4 (c) of the Law No.:5/2020 (Special Act on ensuring Decentralization 2020) and as prescribed in Regulation No.:2018/R-69 (Regulation on Issuing Land for Non-Residential Purposes).

With Respect,

29 Rabeu Al-Akhir 1442,

14 December 2020

Sincerely,

[Signature]

Fathimath Shanna

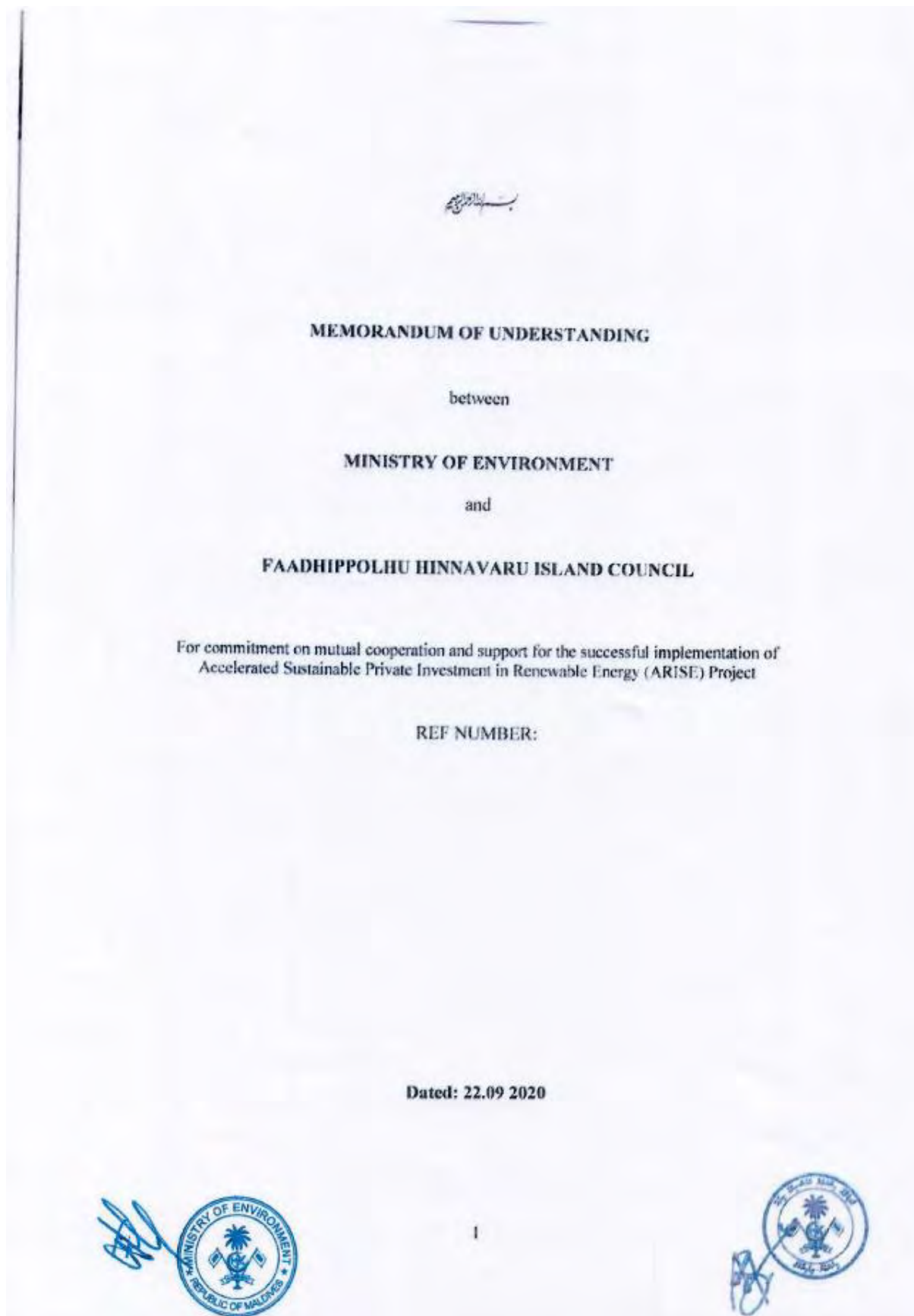
Director

Secretariat of Faadhippolhu Hinnavaru Council

Lh. Hinnavaru, Maldives,

Copy: Secretariat of Faadhippolhu Atoll Council

## 8 Annex 7: MOU signed with Hinnavaru Council



**THIS MEMORANDUM OF UNDERSTANDING** (the “MoU”) is made on 22.09.2020

**BETWEEN:**

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

**And:**

**FAADHIPOLHU HINNAVARU ISLAND COUNCIL**, having its office at Secretariat of Hinnavaru Council, Faadhipolhu Hinnavaru, 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 WORLD BANK has initiated a project in the Maldives titled Accelerating Renewable Energy Integration and Sustainable Energy (P172788) (herein referred to as “the Project” or ARISE), whereby private investors are invited to develop solar Photovoltaic (PV) systems on identified Site(s), deploy Battery Energy Storage Systems (BESS), and grid modernization for Variable Renewable Energy (VRE) integration; and
- C. ME has further decided that the development of Solar PV systems in Faadhipolhu Hinnavaru (hereinafter referred to as “Hinnavaru”) initially planned under Accelerated Sustainable Investment in Renewable Energy (ASPIRE) Project implemented with the support of STRATEGIC CLIMATE FUND and the INTERNATIONAL DEVELOPMENT ASSOCIATION (IDA), shall be carried out under ARISE Project, and
- D. Notwithstanding, the preparatory works for the development of Solar PV systems, the deployment of BESS and grid modernization in Hinnavaru, has been in advanced stage under ASPIRE Project and shall continue to be carried out under ASPIRE Project, and
- E. For the implementation of the Project, ME and the Council has mutually identified the Site(s) owned or possessed by the Council in Hinnavaru (more fully defined in the ANNEXURE herein), to develop solar PV system in accordance with Project Framework Documents (as defined hereunder);
- F. 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 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 ARISE, 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 Hinnavaru to be used for the purpose of Project. The locations, areas and dimensions are more fully described in the ANNEXURE hereto.
  - 1.12 "Site Agreement(s)" 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 utilize any fees acquired through the Site Agreement(s) for the benefit of the Hinnavaru Island community, as maybe agreed between the Parties;
- 2.1.3 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
- 2.1.4 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
- 2.1.5 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
- 2.1.6 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 under Applicable Law and the said Documents, for the execution of this MoU and the Project.

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).
- 2.2.3 Provide any and all other assistance to the Council upon request in the execution of the Project.

3 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.



- 4 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,  
Handhuvarce Hingun,  
Maafannu, Male', 20392, Republic of Maldives  
Email: ps.unit@environment.gov.mv  
Fax: +960 3018301

**For the Council**

Name: Abdulla Ibrahim  
Designation: President  
Address: Faadhippolhu Hinnavaru Council Idhara  
Email: hinn.office@gmail.com  
Fax: +960 6620301

- 5 Any amendments to this MoU shall be in writing and as may be agreed between the Parties. The Parties may under mutual agreement include additional Site(s) to the ANNEXURE I hereunder from time to time through an Addendum to this MoU. The Parties shall ensure that any amendment shall not adversely impact the implementation of the Project.
- 6 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.

IN WITNESS THEREOF, the parties hereto, acting through their duly authorized representatives have caused this Memorandum of Understanding to be signed in 2020 on the 22<sup>nd</sup> day of September.

**For and on behalf of ME**

Name: Ajwad Musthafa  
Designation: Permanent Secretary  
Date: 21.09.2020

**In the Presence of:**

Name: Mohamed Hamdhan Zuhair  
ID Card Number: A073472

Signature & Seal


Signature



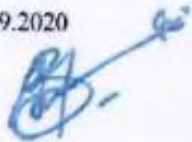

**For and on behalf of the Council**

Name: Abdulla Ibrahim

Designation: President

Date: 22.09.2020

*Signature & Seal*



**In the Presence of:**

Name: Firaaz ismail

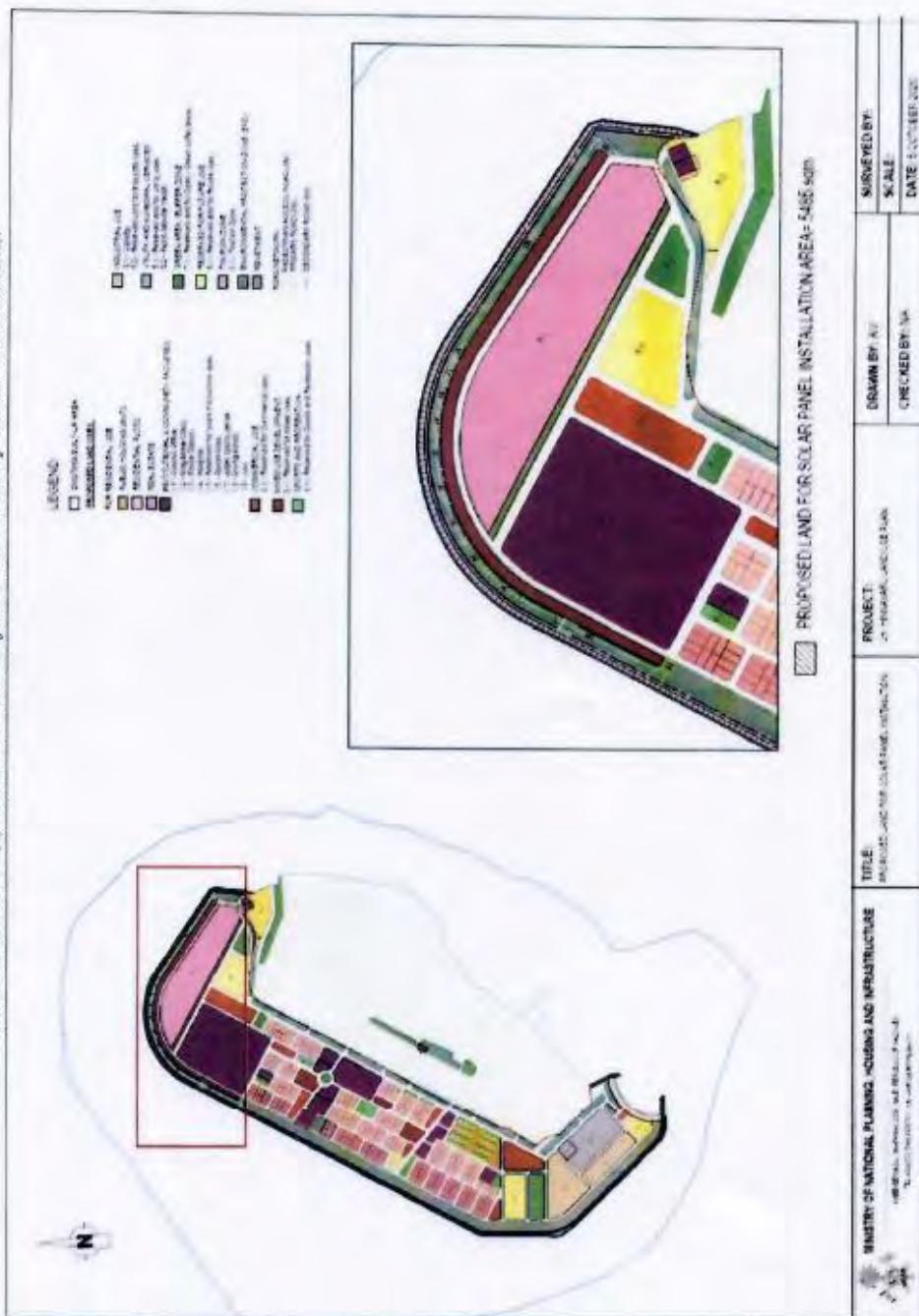
ID Card Number: A120479

*Signature*



ANNEXURE

Selection of the Site(s) listed below are subject to the necessary technical assessments.



*[Handwritten signature]*



*[Handwritten signature]*



## 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
<b>First Tier: Site level</b> 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"> <li>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.</li> <li>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</li> </ul>	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"> <li>• For those who cannot properly write, a staff will assist in filling the complaint form and get it signed by the aggrieved party.</li> <li>• A formal receipt of the complaint will be provided to the aggrieved party.</li> <li>• The IPP/ESP/Contractor will screen the grievance to determine whether the grievance is related to ARISE project or not.</li> <li>• 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.</li> </ul>	
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		<ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• 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</li> </ul>	
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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"> <li>• The aggrieved party must acknowledge the receipt of decision and submit their agreement or disagreement with the decision within 10 days.</li> <li>• If no acknowledgement is submitted from the aggrieved party then the decision will be considered as accepted.</li> <li>• 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.</li> </ul>	
<p><b>Second Tier:</b> <b>Local Council</b> (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"> <li>• 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</li> </ul>	<p>14 working days</p>

		<p>days the grievance can be upgraded to tier 2.</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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).</li> <li>• For those who cannot properly write, a staff will assist in filling the complaint form and get it signed by the aggrieved party.</li> <li>• A formal receipt of the complaint will be provided to the aggrieved party.</li> <li>• The aggrieved party will submit a copy of the decision from tier 1 and the letter submitted</li> </ul>	
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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"> <li>• 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.</li> <li>• The council will screen the grievance to determine if the issues and concerns raised in the complaint falls within the mandate of the project.</li> <li>• 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.</li> </ul>	
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		<ul style="list-style-type: none"><li>• 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.</li><li>• 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.</li><li>• 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</li></ul>	
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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"> <li>• The aggrieved party must acknowledge the receipt of decision and submit their agreement or disagreement with the decision within 10 days.</li> <li>• If no acknowledgement is submitted from the aggrieved party then the decision will be considered as accepted.</li> <li>• 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.</li> </ul>	
<b>Third Tier:</b> 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"> <li>• 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.</li> </ul>	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"> <li>• For those who cannot properly write, the ME staff will fill a complaint form and get it signed by the aggrieved party.</li> <li>• A formal receipt of the complaint will be provided to the aggrieved party.</li> <li>• 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.</li> <li>• 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.</li> <li>• Ministry will forward all the grievances related to the project to the Project Management Unit.</li> </ul>	
--	--	--	--

		<ul style="list-style-type: none"><li>• PMU will screen the grievance to determine if it is related to the project.</li><li>• 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.</li><li>• 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.</li></ul>	
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		<ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• 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.</li> <li>• The aggrieved party must acknowledge the receipt of</li> </ul>	
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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"> <li>• If no acknowledgement is submitted from the aggrieved party then the decision will be considered as accepted.</li> </ul>	
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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"> <li>• All provisions that are required under Health and Safety Regulation for Construction Industry (2019/R-156) should be strictly adhered.</li> <li>• All workers should be provided with Personal Protective Equipment (PPE) by the contractor/Investor. In this regard the following needs to be observed:</li> <li>• Hard hats should be used by all workers when undertaking construction and when undertaking inspections at height.               <ul style="list-style-type: none"> <li>✓ Enclosed safety shoes should be worn by all construction workers.</li> <li>✓ Safety harness should be used by all workers when climbing heights at project sites.</li> <li>✓ Electrical Protective gloves should be provided to workers when dealing with electrical components.</li> <li>✓ Chemical protective gloves should be provided to all workers when dealing with any chemicals.</li> <li>✓ Construction safety goggles should be worn by all construction workers.</li> <li>✓ Ear plugs should be worn by all construction workers working in environments with high noise (working above 75 decibels).</li> <li>✓ Masks should be worn when dealing with chemicals and when working in dusty environments.</li> </ul> </li> <li>• All chemicals should be stored on hard surfaces and should be covered.</li> <li>• Portable drinking water should be available at the construction site during construction phase.</li> <li>• 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.</li> <li>• Construction work site should be demarcated &amp; fenced, and warning signs should be displayed both in English and Dhivehi.</li> <li>• When construction is undertaken clearly demarcated bins for waste disposal needs to be placed and emptied daily.</li> <li>• Open pits should not be left for water to accumulate for a long time.</li> <li>• Any stockpiled sand needs to be covered to prevent sand particles from being airborne.</li> <li>• All vehicles and equipment used for the project needs to be used by well trained personnel.</li> <li>• Any scaffolding used should be to British Standard (BS1139).</li> <li>• When working at night adequate lighting should be provided.</li> <li>• A designated toilet facility should be available within 10 minutes of the construction site.</li> <li>• Breaks should be given to the workforce during mealtimes.</li> </ul>

	<ul style="list-style-type: none"> <li>• Fire fighting equipment should be available at the construction site, at the workers accommodation and any storage areas used for the project.</li> <li>• The site needs to be cleaned daily following completion of days work.</li> <li>• The maximum working hours of all construction workers should be 48 hours per week as per the Employment Act of Maldives.</li> </ul>
Storage and use of hazardous chemicals	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Stored containers should be regularly inspected to identify any leakages.</li> <li>• The storage for any hazardous material and any refueling activities should be undertaken outside the 20m Environmental Protection Zone of the island.</li> <li>• Any hazardous material storage areas should have fire fighting equipment.</li> <li>• 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.</li> <li>• All activities should be undertaken in presence of an experienced supervisor.</li> <li>• Chemical protective gloves, goggles, masks and safety shoes need to be worn when handling any hazardous material.</li> </ul>
Transport, handling and Storage of Solar PV	<ul style="list-style-type: none"> <li>• Mechanical equipment (forklift) should be used when handling the containers with PV Panels during transport.</li> <li>• When moving packaged boxes to construction site, forklift should be used.</li> <li>• Transport should be coordinated with island council and Police.</li> <li>• 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.</li> <li>• If the wind is too heavy avoid handling solar panels</li> <li>• The box should be placed horizontally to avoid tilting.</li> <li>• All staff involved in transport, storage and handling of Solar PV should wear gloves, safety shoes, safety goggles and hard hats.</li> <li>• Do not step on cartons containing PV modules</li> </ul>
Operation of Batching plant	<p><b>1. Maintenance of the general site operations</b></p> <ul style="list-style-type: none"> <li>• Maintain all the equipment including dust collection equipment to prevent any leaks.</li> <li>• Concrete batching operation needs to be undertaken away from residential locations to minimize dust and noise impacts.</li> <li>• All concrete mixing operations should be undertaken during daytime to minimize noise impacts.</li> </ul>

	<ul style="list-style-type: none"> <li>• All staff involved in batch plant operation should wear, safety hats, dust masks, safety shoes, goggles and gloves.</li> <li>• Required safety signs should be installed at the batching plant site with warnings for dust and noise highlighted.</li> </ul> <p><b>2. Material handling and storage</b></p> <ul style="list-style-type: none"> <li>• Aggregates and sand required for concrete mixing should be handled and stored in an enclosed space. Enclosed storage bins or enclosed sealed bags.</li> <li>• As much as possible avoid using chemical concrete additives since they are more toxic. Instead, use sugar or wood based admixers.</li> <li>• Where chemical additives are approved to be used, need to store them in an enclosed space on a hard-impermeable surface.</li> </ul> <p><b>3. Mixer feed operations</b></p> <ul style="list-style-type: none"> <li>• Use the enclosed batch mixer feed as dust prevention and visible emissions.</li> <li>• Use the spray device to prevent dust emissions.</li> <li>• Conduct all the mixing operations from an enclosed space to help prevent emission of dust.</li> </ul> <p><b>4. Conveyors</b></p> <ul style="list-style-type: none"> <li>• To prevent dust emissions, the belt conveyors should be enclosed on both sides.</li> <li>• All conveyor transfer points should be enclosed by fitting the flexible seals to prevent dust.</li> <li>• The turning point of any conveyor should be provided with scrappers to prevent dust collection on the surface belt</li> </ul> <p><b>5. Mixing and loading operations</b></p> <ul style="list-style-type: none"> <li>• Loading concrete should be in such a way that minimizes dust emissions.</li> <li>• All the air borne dust emission generated by material loading and mixing operations should be vented to fabric filtering system.</li> <li>• 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.</li> </ul> <p><b>6. Fugitive dust</b></p> <ul style="list-style-type: none"> <li>• Use water sprays or dust suppression agents to reduce dust.</li> <li>• An air extraction and filtration system for collecting the generated dust should be installed.</li> </ul> <p><b>7. Waste concrete</b></p> <ul style="list-style-type: none"> <li>• Collect the waste concrete in suitable washout pits where it becomes gravel, sludge and sand which can later be reused.</li> </ul> <p><b>8. Waste water</b></p> <ul style="list-style-type: none"> <li>• Waste and contaminated water should be directed to onsite settling ponds and it can be reused later in for dust control, rinsing trucks exteriors.</li> </ul>
Vegetation Removal and levelling	<ul style="list-style-type: none"> <li>• Where trees and palms fall within the project footprint, option to relocate any trees and palms should be considered first.</li> </ul>

	<ul style="list-style-type: none"> <li>• 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.</li> <li>• No vegetation within the 20 m coastal zone should be removed for the purpose of the project.</li> <li>• No protected trees should be removed as part of the project.</li> <li>• Any construction area needs to be levelled to preexisting levels.</li> </ul>
Solid and construction waste during construction phase	<ul style="list-style-type: none"> <li>• For domestic waste produced by the staff clearly demarcated bins for waste disposal needs to be placed and emptied daily.</li> <li>• For construction solid waste should be cleared from work site every day and placed in a designated location.</li> </ul>
Solar Panel waste following lifetime	<ul style="list-style-type: none"> <li>• 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.</li> </ul>
Emissions from vehicles	<ul style="list-style-type: none"> <li>• All vehicles used for the project should have an up to date road worthiness.</li> </ul>
Dust, Noise and Vibration	<ul style="list-style-type: none"> <li>• Restricting working hours from morning 06 to evening 06.</li> <li>• Keeping construction equipment properly stored and secured at a location approved by the council</li> <li>• 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.</li> <li>• Ensure that the construction site is wetted regularly to minimize impact of dust as a result of the project.</li> </ul>
Groundwater	<ul style="list-style-type: none"> <li>• All chemicals used should be stored on hard surfaces on enclosed spaces.</li> <li>• All chemicals should be handled using chemical protective gloves.</li> <li>• All storage containers need to be inspected regularly for any leaks.</li> <li>• Where dewatering is required, the dewatering permit should be attained as per the requirements of Dewatering Regulation (R-1697/2013).</li> <li>• Dewatering activities where required needs to be completed within the shortest possible time.</li> </ul>
Road closure and road safety	<ul style="list-style-type: none"> <li>• All closures need to be preannounced</li> <li>• All road closures need to be coordinated with the council and Police</li> <li>• Clear markings need to be placed on roads during road closure with indicative lights and warning signs.</li> <li>• Following backfilling and resurfacing where required, must ensure that preexisting levels are maintained.</li> <li>• The solar panels need to be placed at a height and angle such that glare doesn't become an issue for the vehicles.</li> </ul>

Impacts on recreational spaces close to installation site	<ul style="list-style-type: none"> <li>• The construction work should be limited to the footprint of the planned PV installation.</li> <li>• No equipment, vehicles should be left unattended.</li> <li>• Area in which construction work is undergoing should be closed off for public access.</li> <li>• Appropriate safety signs should be placed at the construction site in both English and Dhivehi.</li> </ul>
Damage to Utility lines and other cables	<ul style="list-style-type: none"> <li>• The investor/contractor should come into agreement with each and every service provider regarding how any damage is going to be fixed.</li> <li>• Identify the cable routes, utility lines prior to construction commencement and ensure that such areas are avoided.</li> <li>• Where chance damage occurs the investor needs to make arrangements to fix the damage within 24 hours of damage.</li> </ul>
Labour related impacts	<ul style="list-style-type: none"> <li>• If foreign labour is used the labour force needs to be briefed on the language, culture and customs of Maldives.</li> <li>• It is imperative that the comprehensive Labour Management Procedures (LMP) developed for the project is followed (link: <a href="https://www.environment.gov.mv/v2/en/download/10026">https://www.environment.gov.mv/v2/en/download/10026</a>)</li> <li>• Constant and reliable electricity supply should be available at project office and accommodation site.</li> <li>• Shower and toilet facilities should be available at temporary accommodation site.</li> <li>• Toilet and drainage should be connected to local sewer system, where not available septic tanks should be used for treatment prior to disposal.</li> <li>• A minimum ratio of 01 toilet/shower per 20 workers should be maintained. Separate facilities should be provided for men and women.</li> <li>• Individual bedding should be provided to all workers.</li> <li>• Storage space for individual belongings should be provided for all workers.</li> <li>• Male and Female workforce needs to be housed separately.</li> <li>• Designated locations for waste disposal with clearly marked bins needs be established. Bins need to be emptied daily.</li> <li>• Sufficient lighting and cooling systems need to be established.</li> <li>• Portable drinking water should be provided.</li> <li>• The site needs to be cleaned daily.</li> <li>• Monthly inspections to determine pest infestation of the site should be undertaken.</li> <li>• Meals if prepared from a local café or restaurant should be from a Maldives Food and Drug Authority certified facility.</li> <li>• If foreign labor is used, prior to mobilization the construction workers should be briefed in their language on customs of Maldives.</li> <li>• If Covid19 restrictions are in place all guidelines issued by Health Protection Agency of Maldives need to be followed.</li> </ul>

	<ul style="list-style-type: none"><li>• 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.</li></ul>
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## 11 Annex 9: Risk Matrix

Construction phase						
Risks	Party at risk	Probability	Significance	Overall score Risk Score	Risk Level	Comments
Vegetation Clearance	Environment	1	3	4	Low	Considering the locations selected no significant vegetation is expected to be removed. However some branches may have to be trimmed
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.
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
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

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	1	5	6	Low	Project undertaken at locations that are environmentally not sensitive
Impact on biodiversity (protected species, sensitive species etc)	Environment	1	5	6	Low	Project undertaken at locations that are environmentally not sensitive
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

Lack of clearly demarcated designated areas for waste disposal at the project site (s)	Environment/Public	6	8	14	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
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
Visual aesthetic impacts	Public	1	5	6	Low	The concepts are made such that the aesthetics are not compromised and taking into account the requirements of the council

Disturbance to operator of IWMC	Public	5	8	13	Moderate	Can be managed with proper mitigation measures/supervision
Disruption of recreational activities in Stadium	Public	3	3	6	Low	Considering the location near the stadium is outside the fence of the stadium the impacts are likely to be low
Damage to revetment	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

Scoring scheme for risks	
0 to 7	Low
7 to 14	Medium
14 to 20	High