# 1 Environmental and Social Screening Report: Installation of 1.5 MW Ground Mounted Solar PV in Eydhafushi

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

## A. Description of Intervention

**Project Identification**

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| Project title | Installation of 1.5 MW solar PV Installation in Eydhafushi under Accelerating Sustainable Private Investment in Renewable Energy (ASPIRE) project |
| Project Proponent | Ministry of Environment |

**Project Location**

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| Location | **(Location Map and Site Photographs to be Annexed): Attached in Annex1** |
| Definition of Project Area<br><br>*(The geographical extent of the project & areas affected during construction)* | Eydhafushi is administrative capital of Baa atoll. Eydhafushi is located in the middle of the atoll in the eastern rim. The geographic coordinates of Eydhafushi is 5° 6'7.81"N, 73° 4'7.03"E. It is the most populous island in the atoll with a resident population of 2894 people. The total area of the island is 55 ha, which includes 25 ha of reclaimed land. The island being the capital of the atoll most of the services are established in Eydhafushi.<br><br>Even though, Eydhafushi doesn't have unique environmental features, Baa atoll is the first declared biosphere reserve in Maldives with many environmentally sensitive sites. The major economic activities in this island include government employment, working in resorts, retail business, fishing and thatch weaving.<br><br>The project involves installation 1MW of Solar PV outside of the ring road of Eydhafushi. The project is planned to be implemented in the reclaimed land of Eydhafushi. |
| Adjacent land and features | The closest to the site is Island Waste Management Centre (IWMC). The IWMC is 05 meters to the east of the middle PV installation section. Moreover, the childrens park of Eydhafushi and proposed recreational beach is in proximity to the site. These two sites are around 50 meters to the west of the middle PV installation section (see Annex 1 and 5).<br><br>In addition as per the land use plan public housing is planned to be given close to the site (see Annex 5). The public housing units planned are around 15 meters |

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| | north of the PV site and is at the opposite end of a 09 meter road (see Annexes 1 and Annex 5)<br><br>Note: these areas are marked in the figure given in next section for easy reference. |

**. Project Justification**

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| Need for the project<br><br>(*What problem is the project going to solve*) | This project is needed to achieve the objectives of the Strategic Action Plan (SAP) 2019 to 2023 (https://presidency.gov.mv/SAP/) of the government which has clear targets to achieve in terms of renewable energy. In this regard, the target of the government is to achieve 20 percent increase of renewable energy in National Energy mix by 2023 when compared to 2018 levels (Target 2.1). This project will facilitate to achieve this objective.<br><br>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. |
| Purpose of the project<br><br>(*what is going to be achieved by carrying out the project*) | As per the Strategic Action Plan (SAP) 2019 to 2023 (https://presidency.gov.mv/SAP/) of the government it is a target (Target 2.1) of the government is to achieve 20 percent increase of renewable energy in National Energy mix by 2023 when compared to 2018 levels. To attain this target ministry aims to achieve 70% of peak load of electricity from renewable energy sources from all inhabited islands. This project facilitates to achieve this objective in Eydhafushi. This project when implemented will achieve 83% of peak load of electricity from renewable energy sources. |
| Alternatives considered<br><br>(*different ways to meet the project need and achieve the project purpose*) | While as alternatives the GoM can explore other sources of renewable energy like wind or floating solar, in terms of the currently trailed and developed technology and context in country, Solar PV on land is most viable in terms of environment condition of Maldives, available technology and costs. In terms of renewable energy costs, utility scale solar PV is at USD 0.068 per Kilowatt- hour (kWh), for onshore wind it was USD 0.053/kWh and for offshore wind ) USD 0.115/kWh (source: https://www.irena.org/publications/2020/Jun/Renewable-Power-Costs-in-2019) . Cost of Solar PV is progressively falling with 82% decline from 2010 to 2019, compared to this wind energy decline 40% within the same period. Even though inshore wind is cheaper at current rate, at an urban area like the proposed solar PV is more ideal considering the scenic impacts, electromagnetic interference and noise impacts.<br><br>Global Horizontal Irradiance (GHI) is the total amount of shortwave radiation received from above by a horizontal surface. This value is of particular interest to photovoltaic installations and is used to determine potential of geographical areas for solar PV installation. Research suggests GHI values for Maldives are consistently high, with an average between 5.4.kWh/$m^2$ and 5.7 KWh/$m^2$. The |

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| | highest GHI is identified in the South of the archipelago, where average daily sums exceed 5.6 kWh/$m^2$ (yearly sum about 2050 kWh/$m^2$) and more. The season of highest irradiation with daily sums above 6.2 kWh/$km^2$ lasts three months (from February to April). Second season of higher solar radiation, with daily sums from 5.3 to 5.6 kWh/$m^2$, is found in a period from August to October (source: https://www.esmap.org/node/3298) .<br><br>Another option is to put Solar PV on roof tops however since a number of roofs will need to be attained for this purpose and due to long term nature of the project, land areas which can be used for multiple purposes are the most ideal. Rooftops are considered not the most ideal because of the scale of the project and duration. 1 ha of roof space will be needed to install solar PV on the roofs. Will be difficult to find such large space for solar installation on rooftops on small islands. Furthermore, legally this will require agreements to be signed with multiple roof owners hence more likely to have complications. Moreover, rooftops are uncertain in terms of renovations needed to buildings within 15 years. If rooftops new buildings need to be prioritized which are not in abundant supply in most islands. Hence in islands where there is space that can be given for the purpose of the project land areas are preferred. |

**. Project Description**

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| Proposed start date | April 2021 |
| Proposed completion date | March 2022 |
| Estimated total cost | Total cost will depend on the investor selected |
| Present land ownership | Council, Approval from Ministry of Planning, Housing and Infrastructure attained for solar PV installation |
| Description of the project<br><br>(*with supporting material such as maps, drawings etc attached as required*) | The project involves installation 1MW of Solar PV outside of the ring road of Eydhafushi. The project is planned to be implemented in the reclaimed land of Eydhafushi. The project will be implemented by an investor selected through a bidding process. Annex 1 shows the map of solar installation site. Illustration of how the area look following solar installation is provided in Annex 2. An area of 12,944 $m^2$ will be utilized for the purpose of this project Annex 1. The ground mounted solar panels will be installed in three sections (Annex 1). Check Annex (2) for detailed description. |
| Project Management Team | The project management team from the Ministry of Environment side includes the following members:<br><br>Maumoon Khalid: Project Manager<br><br>Thaalooth Rasheedh: Financial Management Specialist<br><br>Mohamed Hamdhaan Zuhair: Environmental and Social Safeguards Specialist<br><br>Abdulla Afsal: Procurement Management Specialist<br><br>Ifaad Waheed: Communications Specialist |

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| | Akram Waheed: Senior Energy Specialist<br>Nuzhath Ahmed: Project Coordinator<br>Aminath Hanaan Mohamed: Monitoring and Evaluation Specialist |

## B. Site Description Questionnaire

### 1. Site Setting and Land use/Ownership

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

Please find attached the land approval from planning ministry. The land is owned by the Island Council of Eydhafushi. (Check Annex 6 and 7)

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

The current land is not used for any productive purpose currently and is land that has been reclaimed in 2014. Planned land use activities includes, residential developments, commercial developments, parks and recreational areas, industrial areas and land allocated for government buildings, the details of which are provided in Annex 5.

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

The reclamation of Eydhafushi 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 planned land use is provided in Annex 5 of this screening document. As for the location that Solar PV is installed, as it is the space between the outer ring road and the coastal protection, no particular landuse have been allocated for this area. Underneath the panels coastal vegetation can be planted as part of is under the Environment Protection Zone of the island (Annex 5). This is in fact a requirement of land approval (check Annex 6)

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

Reclaimed land hence no particular historical use

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

Existing:

1. Ring road (adjacent to the site)
2. Island Waste Management Centre (05 m to the east of the middle section)
3. Children's playground and Recreational beach (50 m west of the middle section)

Planned

1. Residential Development (15m to south of PV installation)
2. Recreational Beach (50 m west of the middle installation).

Note: All areas are marked in the figure below.


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

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

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

A total of 104 responses were received from Eydhafushi for the survey. This represents around 8% of the resident population. Despite the efforts to involve more women by the council by distributing the survey to women specific social media groups, majority of the respondents were men with 71.2% of the respondents. Majority of the respondents are youth of the island with 20 to 45 years being the dominant age group. 98.1% of those who were surveyed were happy with the solar PV installation project. 77% were happy with the location of installation with 6.7% having reservations for the location and the rest with no particular view on the location. Responses to the issues raised regarding and other aspects of the project are highlighted in the detailed report provided in Annex 4.

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

*1)* ***Current and projected population;*** Based on population prediction for 2020 (Bureau of Statistics):

Total: 2894

Males:1548

Females:1346

*2)* ***Number of households (and Empty houses);*** As per council: 554 households and 94 Empty plots

*3)* ***Planned development activities;*** **(please see section above and attached Landuse plant in Annex 6)**

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

Agriculture: 10%

Other Industry: 28%

Service: 67%

*5)* ***Income distribution;***

Based on household income and expenditure survey of 2016 for Baa atoll Labour Force Participation rate is 52.5 % and as per the survey on average women earn MVR68.43 per hour while men earn on average MVR56.95 per hour

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

Baa atoll Hospital is located in Eydhafushi, the capital of the atoll.

**C. <u>Screening for Potential Environmental Impacts in relation to the proposed project intervention</u>**

| | **Screening question** | **Yes** | **No** | **Significance of the effect**<br>**(Low, moderate, high)** | **Remarks** |
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| **Section A: General** | | | | | |
| 1 | Will construction and operation of the Project involve actions which will cause physical changes in the locality (topography, land use, changes in water bodies, etc) | | **No** | **N/A** | Currently it is reclaimed barren land with no vegetation. The project is not expected to disrupt any land use or require clearance of vegetation. |
| 2 | Will the Project involve use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health? | **Yes** | | **Moderate** | 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.<br>Risks may include the following:<br>➢ Risk of spills from fuels, chemicals, waste oil and other hazardous materials used during construction phase.<br>➢ Health risks associated with storage, handling and transport of Solar PV.<br>Health and safety risks associated with construction |

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| | | | | | work for construction workers and the public. |
| 3 | Will the Project produce solid wastes during construction or operation? | **Yes** | | **Moderate** | Waste generated during construction phase can be categorized as construction waste and general waste.<br><br>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 Regional Waste Management Facility at Thilafushi.<br><br>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.<br><br>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. |
| 4 | Will the Project release pollutants or any hazardous, toxic or noxious substances to air? | **Yes** | | **Low** | Overall, as it is a renewable energy project the project will facilitate to improve air quality, as emissions from diesel powerhouses will be reduced.<br><br>However, some negative emissions can occur from vehicles used in the project during both construction and operational phase.<br><br>In addition, dust will become an issue, especially during concrete mixing works. When crystalline silica particles |

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| | | | | | from concrete are inhaled for a prolonged period it can cause diseases like Silicosis, Lung Cancer, Chronic obstruction pulmonary disease and kidney diseases.<br><br>As all construction materials needs to be imported, this again increases the carbon footprint of the project.<br><br>As Maldives, at present, does not have a hazardous 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. 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** | For construction phase, noise will be generated, especially during concrete mixing.<br><br>However, significant noise is not anticipated other than this at the construction site, as pad footings are considered at this stage as the preferred foundation method (Annex-1 project description). However, if piling method is decided following detailed design, depending on method, it will lead to considerably more noise impacts. Even if piling, screw piling method needs to be considered first if practical as it leads to significantly less noise.<br><br>At a conceptual level pad footings are considered as the preferred foundation method (see Annex 1 project description). Hence vibration impacts are unlikely to occur if this method is adopted. However if piling is undertaken vibrations can occur. If piling is considered during detailed design stage, screw piling needs to be preferred where practical as it causes considerably less vibration. Moreover, feasibility and |

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| | | | | | ground condition needs to be considered if piling is to be undertaken.<br><br>As for operational phase, depending on angel, light reflection from the panels can result in disturbances to the road users. |
| 6 | Will the Project lead to risks of contamination of land or water from releases of pollutants onto the ground or into surface waters, groundwater or coastal waters? | **Yes** | | **Low** | Contamination during construction phase is likely from leakages that may arise from any chemicals, or hazardous waste that is stored. |
| 7 | Will the project cause localized flooding and poor drainage during construction?<br><br>Is the project area located in a flooding location? | **Yes** | | **Low** | If not properly levelled following construction of panels and cable laying can lead to localized water accumulation..<br><br>The reclaimed land is at a higher level than the natural island level, hence the project is not located in a flood prone area. |
| 8 | Will there be any risks and vulnerabilities to public safety due to physical hazards during construction or operation of the Project? | **Yes** | | **Moderate** | Some of the risks the public maybe exposed during the construction phase include the following:<br>• Falling to open pits<br>• Open pits at project site left for a long time can lead to mosquito breeding<br>• Electrocution due to open wiring<br>• Falling objects as the project involves working at heights<br>• Unattended equipment left in site without proper supervision leading to public use accidents and hazards.<br>• 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.<br>• Exposure to dust from concrete mixing. |

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| | | | | | During operational phase the main risks to the public can be identified as follows:<br>• 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.<br>• Light reflected from the panels if not appropriate height and angle can lead to road accidents.<br>• The transformer if not enclosed can lead to electrocution risk to public.<br>• Potential risk of fire due to faults in electronic equipment.<br>• Potential risk of lightening |
| 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** | Works are planned to be undertaken adjacent to a proposed road. And cable laying planned for proposed roads at the reclaimed land. The road has not been constructed at present and unlikely to be in place when the project materializes.<br>By the time the project starts (highly unlikely) if the roads are there then road closure at certain times may occur..<br>However as these are small island communities not much traffic issues are expected as a result of the project. |
| 10 | Are there any routes or facilities on or around the location which are used by the public for access to recreation or other facilities, which could be affected by the project? | **Yes** | | **Low** | As highlighted a children park and recreational swimming area is close-by. However not much disruption is expected as the panel installation area does not cover the park or the recreational beach area. As highlighted previously the solar installation site is around 50 meters from these areas. So any impacts are negligible. |
| 11 | Are there any areas or features of high landscape or scenic value on or around the | **Yes** | | **Low** | As the panels are located in the outer ring road, if the panels are too low it may block the sea view. However, the panels are planned to be placed at |

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| | location which could be affected by the project? | | | | around 09 feet hence the eye level view of the sea is not disrupted. |
| 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? | | **No** | **N/A** | Construction activities planned to be undertaken in barren reclaimed land. |
| 13 | Is the location within or adjacent to the coastal zone? If so, what is the distance to the coast? | **Yes** | | **Moderate** | The proposed area is 10 meters from the landward side of the revetment. At present the area is devoid of any vegetation. Usually for islands under Land Act of Maldives 20 meter area is considered as green zone.<br><br>Underneath the structure coastal vegetation should be accommodated. This is a condition of the land approval check Annex 6. |
| 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? | | **No** | **N/A** | 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 Eydhafushi. However Baa atoll as a whole is a Biosphere reserve . Within which 10 Protected Areas have been declared so far. Of which the closest site to Eydhafushi island is Dhigali Haa and Dhigili Giri, which is 5 kilometers away. |
| 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 greenery is expected as part of the project |

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| 17 | Will the project cause the removal of trees in the locality? | | **No** | **N/A** | The area is in reclaimed land so no vegetation removal is expected. At present the area is devoid 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 previously highlighted, at the time of field visit only a park and IWMC facility was there in the reclaimed land of the island . However as per the landuse plan received from the council, the area has a recreational swimming area planned and mostly the area consists of public housing (see Annex 5). These are intended to be located at distances of<br>Existing:<br>1. Island Waste Management Centre (05 m to the east of the middle section)<br>2. Children's playground (50 m west of the middle section)<br><br>Planned:<br>1. Residential Development (15m to south of PV installation)<br>2. Recreational Beach (50 m west of the middle installation). |
| 20 | Are there any areas on or around the location which are densely populated or built-up, which could be affected by the project? | | **No** | **N/A** | The project is undertaken in the reclaimed land of the island where at present very few activities are undertaken. At present it includes a children's park and an IWMC facility. |
| 21 | Are there any areas on or around the location which are occupied by sensitive land uses e.g. hospitals, schools, places of worship, community facilities, which could be affected by the project | **Yes** | | **Low** | As mentioned there is a children's park nearby. However the area immediately adjacent to park is left without installing solar PV (empty space between segment 2 and 3) as this is the area where council is developing a recreational beach.<br>These areas are around 50m from the |

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| | | | | | proposed project areas. So any impacts are negligible. |
| 22 | Are there any Defence Installations / Airport Routes | | **No** | **N/A** | No such installations nearby |
| 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? | | **No** | **N/A** | 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? | | **No** | **N/A** | 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. | | **No** | **N/A** | Does not involve treatment of Solid waste, construction waste will be required to be transferred to regional waste management facility at Thilafushi, any domestic general waste generated by the construction work force will be managed through the island waste stream to be managed at the Island Waste Management Center and their on forth the Regional Waste Management Facility in Vandhoo. |
| **Section B: Specific Screening Questions on Floating Solar** | | | | | |
| 3 | Water body identified for floating solar is lagoon, coastal water way, harbor/jetty area or other, please provide details in the comments of the site | | | **N/A** | |
| 4 | Is the identified water body is used for water supply? | | | **N/A** | |
| 5 | Is the identified water body used for fishing activities? | | | **N/A** | |

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| 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** | As identified in the social survey undertaken for the project (Annex 4), the community mostly sees the project to be beneficial, with 98% of the survey respondents suggesting the project will be very beneficial. In terms of location 77% of the survey respondents were happy with the location.<br><br>Some were concerned about the impacts on the recreational area for children, however the recreational area is left empty without installing the solar PV. There is around 55m between PV installation site and these areas so no impacts on these activities are envisioned. Moreover, the solar panels are installed such that underneath can be used by joggers and other recreational users. This will add recreational value.<br><br>Thus, overall the impacts can be seen as limited and mostly positive. |
| 2 | Land acquisition resulting in loss of income from agricultural land, plantation or other existing land-use. | | **No** | **N/A** | No land acquisition required as the area is side of the road which cannot be used for any other purpose. |
| 3 | Land acquisition resulting in relocation of households. | | **No** | **N/A** | see above |
| 4 | Cause any reduction of access to traditional and river dependent communities (to river and areas where they earn for their primary or substantial livelihood). | | **No** | **N/A** | |

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| 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** | 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.<br><br>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.<br><br>No gender specific issues were identified by any survey respondents during the survey. As identified previously, despite the attempts by the council, majority of the social survey respondents are men. As per the stakeholder engagement plan developed for the project, consultation will be undertaken throughout project implementation thus, once Covid restrictions are lifted more focused consultations could be undertaken. |
| 7 | Will the project create significant / limited / no Social impacts during the construction stage? | **Yes** | | **Moderate** | Risks already covered in section A question 8. |
| **Section D: Impacts of Construction** | | | | | |
| 1 | Will the project lead to flooding of adjacent areas | | **No** | **N/A** | No, further details have been provided in section A question 7 |
| 2 | Will it involve the improper storage and handling of substances leading to contamination of soil and water | **Yes** | | **Low** | Further details have been provided in section A question 7 |

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| 3 | Will the activity lead to elevated noise and dust emission? | **Yes** | | **Low** | 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.<br>Dust will mostly be generated during concrete mixing process. |
| 4 | Will project activities lead to disruption to traffic movements | **Yes** | | **Low** | Some disruptions may occur, at the time of the field visit the roads have not yet been properly demarcated and the reclaimed area was barren. However if the roads come prior to the project some disruptions may occur. |
| 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** | The following issues may arise:<br>• As highlighted accidental damages to cables and utility lines may occur. This may lead to disruption of service to public.<br>• Conflicts may occur if any human health impacts occur to the public due to negligence of construction work force.<br>• Moreover, especially if foreign work force is involved conflicts may occur with local community. |

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| | | | | | • The Labour Management Procedures developed for the project needs to be followed to address these issues (link: https://www.environment.gov.mv/v2/en/download/10026). |
| 7 | Are there adequate facilities for storage of construction goods & materials | **Yes** | | **Low** | Eydhafushi 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 are required. The investor will be encouraged to employ local staff within the island for the project, or the investor staff maybe based in capital Male' and may visit these sites for routine inspections.<br>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** | During the field visit 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:<br>• Lack of sanitation and clean drinking water at the project site.<br>• Over congestion of work force in a small space can lead to disease and other such outbreaks. Often foreign labour in Maldives are housed by contractors in unhygienic and inhumane conditions.<br>• Lack of access to shower facilities.<br>• Food being served in unhygienic conditions.<br>• Lack of availability of adequate meals.<br>• Lack of clearly demarked designated areas for waste disposal can lead to unhygienic living/working environment which can lead to disease etc.<br>• 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.<br>• Pest infestation in the work space and living quarters can lead to unhygienic working/living conditions and can lead to serious disease outbreaks.<br>• If foreign labour is involved social conflicts with the community due to differences in culture.<br>• If project undertaken during Covid 19 situation. Chance of transmission of Covid from the workforce to the community. |
| 12 | Are facilities for disposal of solid waste available on the | **Yes** | | **Moderate** | An operational Island Waste Management Centre (IWMC) is there very close to the construction site. |

| | | | | | |
|---|---|---|---|---|---|
| | Island- please specify the forms in the comments | | | | 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). |
| **Section E: Cumulative Impacts** | | | | | |
| 1 | Cumulative effects due to proximity to other existing or planned projects with similar impacts | **Yes** | | **Moderate** | Lot of new developments likely to occur 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.<br>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. |

## 8. Project operating requirements

| | | Yes | No |
|---|---|---|---|
| 24 | Does the project belong to a prescribed category of the Environmental Protection Authority for EIA | | No, But screening will be undertaken in parallel to this World Bank screening |
| 25 | Does the project need to obtain clearances from agencies such as the EPA, Island Council, Atoll Council etc : | Yes. The following approval have already been attained (see Annex 7 and 8):<br>1. MOU signed with council confirming the location<br>2. Ministry of Planning Housing and Infrastructure provided the Landuse approval<br>In addition screening document will be submitted to EPA for a screening decision.<br>As per the ESMF of the project following screening the investor will undertake the required assessments. | |

## 9. Conclusion and Screening Decision

**Summary of environmental effects:**

Assuming that all mitigation measures are implemented as proposed, the following effects cane 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):**

| | |
|---|---|
| ✓ | 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.<br>Therefore, standalone Environmental and Social Assessment not required, an Environmental and Social Management Plan would be required prior to the project proceeding.<br>An indicative mitigation plan to the identified risks are provided in Annex 9 |
| | 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:** 08th September 2020

**Signature:**

**Screening report reviewed by:**

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

**Date: 08th September 2020**

**Signature:**

**Approved by: (world bank approved via 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 Eydhafushi. The project is planned to be implemented in the reclaimed land of Eydhafushi. The project will be implemented by an investor selected through a bidding process. Figure 1 shows the map of solar installation site. Illustration of how the area look following solar installation is provided in Figure 2. An area of 12,944 $m^2$ will be utilized for the purpose of this project (Figure 1). The ground mounted solar panels will be installed in three sections.


*Figure 1 Solar Installation Location Eydhafushi*

*Figure 2 Illustration of solar PV installation in Eydhafushi*

*Figure 3 Photo of the installation site*

## 3.3 General Method Statement for construction

### 3.3.1 Installation of PV Structure

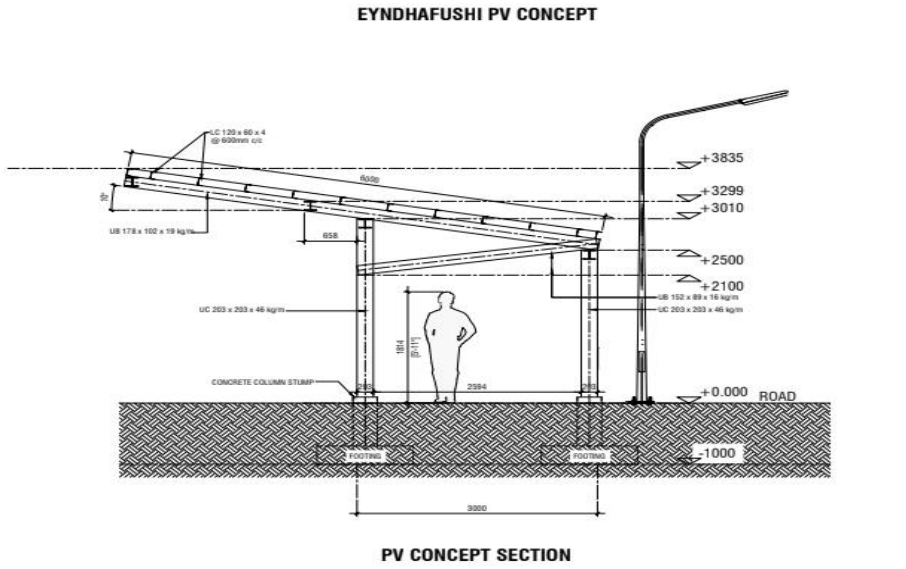



*Figure 4 PV Concept*

#### 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. This is a general method statement for pad footing, the final method will dependent on final design.

#### 3.3.1.2 Purpose

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

#### 3.3.1.3 Scope

Scope of works associated with this project are

1- Site Preparation
2- Foundation
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.

### 3.3.1.6 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.

### 3.3.1.7 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.

### 3.3.1.8 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.

### 3.3.1.9 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).

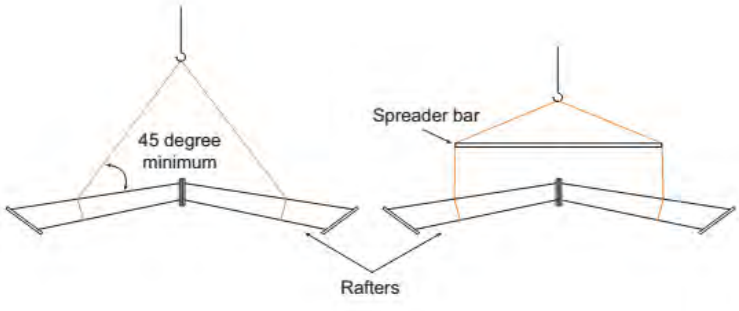



*Figure 5. Hoisting cables.*

### 3.3.1.10 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.

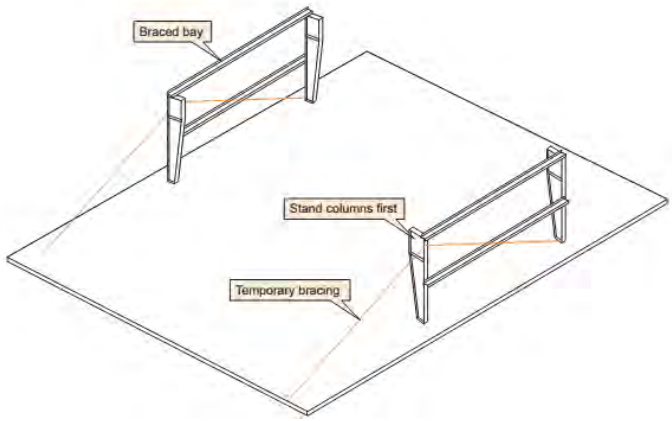



*Figure 6. Bay erection and temporary bracing.*

### 3.3.1.11 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 suctions. 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.

### 3.3.1.12 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.

### 3.3.1.13 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.

### 3.3.2 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.

### 3.3.3 Cable Laying

This subcomponent involves connecting the panels to the existing grid of Eydhafushi. The connections will be made as shown in the figure below (green lines represent the connection of panels to the existing substations).


*Figure 7: Solar PV grid connection details*

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;

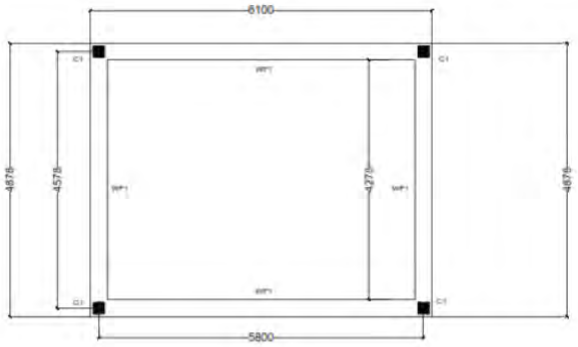
CAUTION CAUTION CAUTION

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.

### 3.3.4 Transformers

A transformer will be placed in each of the PV installation sites. The outdoor transformer will be placed on a concrete slab of 5 meters by 4 meters (Figure 8). The transformer will be fully enclosed. Foundation details of the transformer slab is provided below. The location is provided in Figure 7.




Foundation Details

FIGURE 8 TRANSFORMER ON CONCRETE SLAB

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

1. Clear and Level the required area
2. Add around ¾ inch gravel layer
3. Install achor barriers and rebar
4. Pour concrete, set wall or container anchors
5. Level the concrete

- The transformer will not be accessible to the public.
- Appropriate warning signs will be displayed outside of the transformer hut.

# 4 Annex 3: Council meeting Minutes

| | |
|---|---|
| **Subject:** | **Council Consultation regarding ARISE and solar PV installation locations** |
| **Date:** | June 29, 2020 |
| **Location:** | Online |
| **Start Time:** | 10:30 |
| **End Time** | 11:30 |
| **Participants** | Eydhafushi Council and PMU |

**AGENDA ITEMS**

- Project Update
- Survey to be disseminated to public
- Queries on the project

**DISCUSSION POINTS**

- A brief update on the current status of the project was given to the council. Including the different components of the project and timeline.

- A brief introduction was given on the purpose of the survey and ME requested Council to share the survey on the Councils' Facebook page and other online community groups of the island. ME requested to use any other platforms that would increase the reach of the survey to its maximum.

- Further ME requested to coordinate with the Women Development Committees of the island to increase the reach of the survey to women as typically the number of females responding to survey deemed less.

- 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.

**OUTCOMES**

- Council to share the survey on Council Facebook page and online community groups.
- ME to send a letter to Council requesting the Council to get approval on land use plan from MoNPHI
- Council to get approval from MONPHI for land use plan.

**Attendees Information List:**

| # | Institution | Name | Designation | Email | Contact No. |
|---|---|---|---|---|---|
| 1 | Secretariat of Eydhafushi Council | Tholaal AbdulRahmaan | President | tholal.bah@gmail.com | |
| 2 | Secretariat of Eydhafushi Council | Hawwa Sameeha | Vice President | info@eydhafushi.gov.mv | |
| 4 | Ministry of Environment | Hamdhaan Zuhair | ESS Specialist | hamdhaan.zuhair@environment.gov.mv | 7668606 |
| 5 | Ministry of Environment | Nuzuhath Ahmed | Project Coordinator | nuzhath.ahmed@environment.gov.mv | 7753909 |
| 6 | Ministry of Environment | Ifaadh Waheed | Communications Officer | ifaadh.waheed@environment.gov.mv | 7908800 |
| 7 | Ministry of Environment | Aminath Hanaan Mohamed | Monitoring and Evaluation Officer | aminath.hanaan@environment.gov.mv | 9110414 |

# 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 B.Eydhafushi under Accelerating Renewable Energy Integration and Sustainable Energy (ARISE) project funded by the World Bank and other development partners. The key activities planned for Eydhafushi 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

Eydhafushi is administrative capital of Baa atoll. Eydhafushi is located in the middle of the atoll in the eastern rim. The geographic coordinates of Eydhafushi is 5° 6'7.81"N, 73° 4'7.03"E. It is the most populous island in the atoll with a resident population of 2648 - people. The total area of the island is 55 ha, which includes 25 ha of reclaimed land. The island being the capital of the atoll most of the services are established in Eydhafushi.

Even though, Eydhafushi doesn't have unique environmental features, Baa atoll is the first declared biosphere reserve in Maldives with many environmentally sensitive sites. The major economic activities in this island include government employment, working in resorts, retail business, fishing and thatch weaving.

For Eydhafushi the project interventions proposed include the following:

1. 1 MW Solar PV installation Location Annex 2
2. 3 MWh Battery Energy Storage System
3. Grid upgradation

## 5.2 Methodology

### 5.2.1 Data Collection

A conference call was held with the island council on 29th June 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 made a public announcement on 01st July 2020 and the survey was distributed to public viber groups on the same day. The survey was publicized through the council official facebook page and the facebook page of the ministry as well.

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

Media Report about Community Survey on 6 islands – avas.mv
https://avas.mv/85484
Media Report about Community Survey on 6 islands – Public Service Media
https://psmnews.mv/71144
Media Report about Community Survey on 6 islands – iru.mv
https://iru.mv/171026

### 5.2.2 Analysis

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

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

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

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

## 5.3 Results and Discussion

### 5.3.1 General characteristics

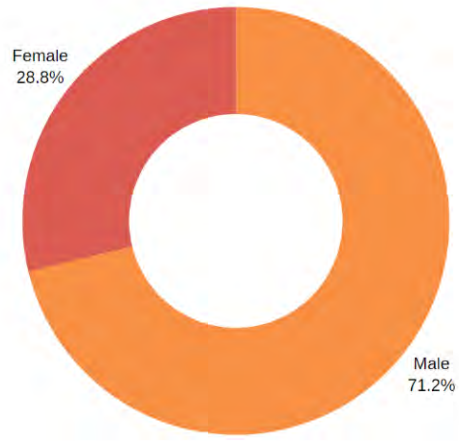



FIGURE 1 GENDER DISTRIBUTION OF SURVEY RESPONDENTS

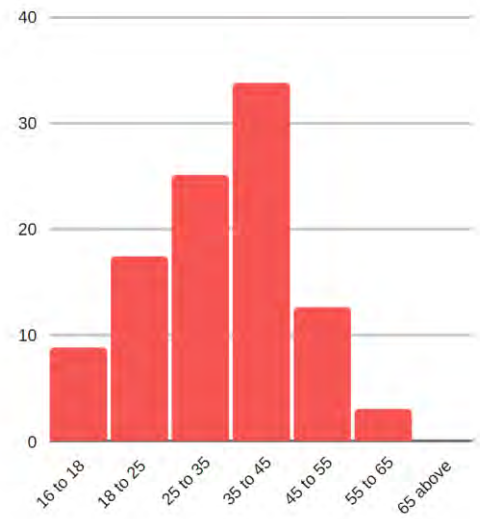



FIGURE 2 AGE DISTRIBUTION OF SURVEY RESPONDENTS

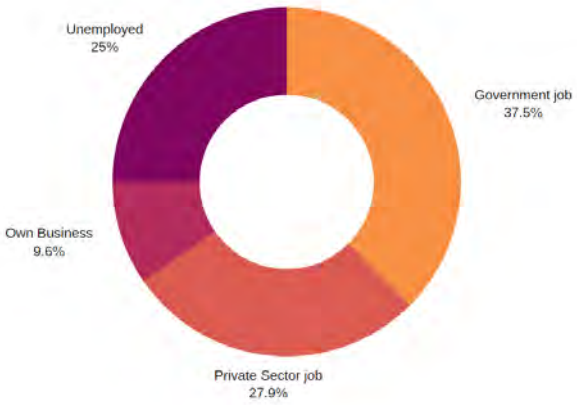



FIGURE 3 EMPLOYMENT STATUS OF SURVEY RESPONDENTS

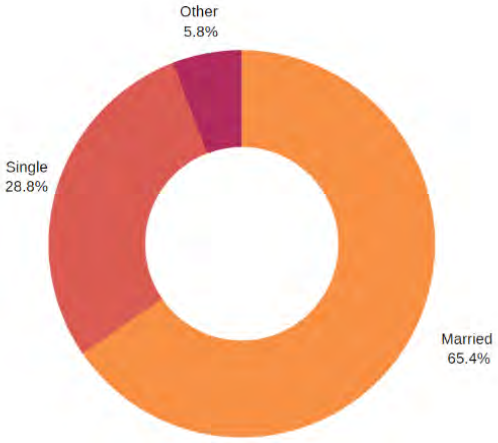



FIGURE 4 CIVIL STATUS OF SURVEY RESPONDENTS

A total of 104 responses were received from Eydhafushi for the survey. This represents around 8% of the resident population. Despite the efforts to involve more women by the council by distributing the survey to women specific social media groups, majority of the respondents were men with 71.2% of the respondents (Figure 1). Once the covid restrictions are eased, during future assessments and engagements targeted consultations with women will be undertaken as specified in stakeholder engagement plan for the project.

Majority of the respondents are youth of the island with 20 to 45 years being the dominant age group (Figure 2). 65.4% of those who are surveyed are married figure 4. In terms of employment the majority of those who are surveyed are employed with 75%. Amongst them government sector employees are the most prominent (Figure 3).

### 5.3.2 Electricity usage and reliability

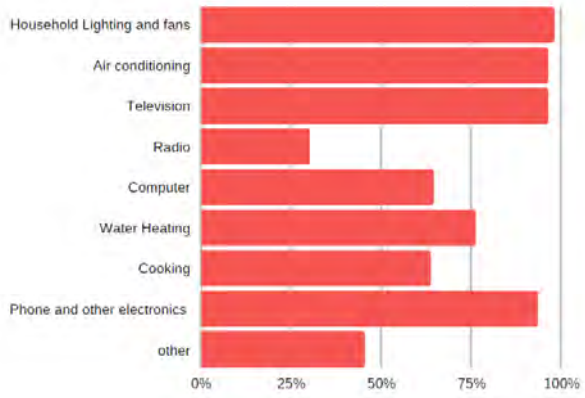



FIGURE 5 HOUSEHOLD USAGE OF ELECTRICITY

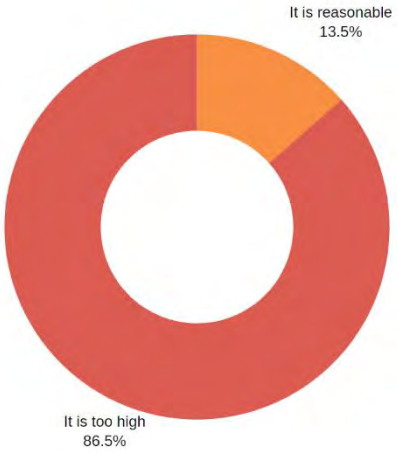



FIGURE 6 VIEW ON PRICE OF ELECTRICITY

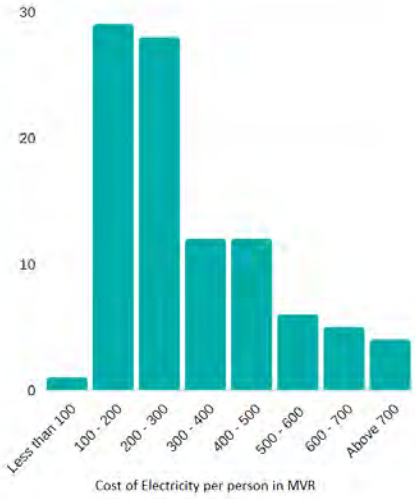



FIGURE 7 COST OF ELECTRICITY PER UNIT HEAD

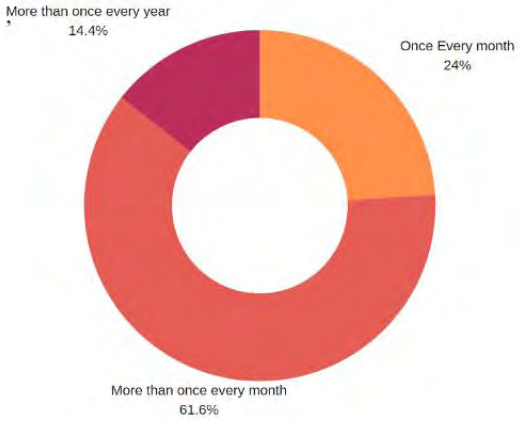



FIGURE 8 FREQUENCY OF BLACKOUTS

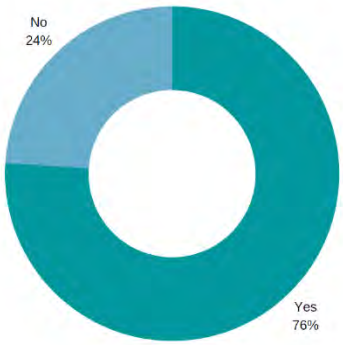



FIGURE 9 DAMAGE TO ELECTRICAL APPLIANCES DUE TO BLACKOUTS

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 and charging electronic devices is the main aspects to which electricity is

used in the households of Eydhafushi. It is noticeable that more than 50% of the surveyed households use computer systems and electric water heaters (Figure 5). 86.5% of the respondents believe that the current price of electricity is too high (Figure 6). On average per head MVR 100 to MVR 300 is spent on electricity on a monthly basis (Figure 7). The public perceives that blackouts are also very frequent 61.6% suggesting blackouts more than once every month (Figure 8). Moreover 76% of the respondents suggested that electrical appliances have been damaged as a result of these 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.

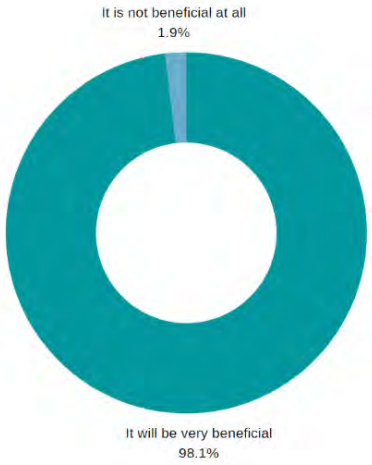



FIGURE 10 BENEFITS OF SOLAR PV

98.1% of those who were surveyed identified that the Solar PV installation undertaken through the project will be very beneficial (Figure 10). Based on the text analysis that was undertaken the primary expectation of the public is that the price of electricity will reduce as a result of the project (Figure 11). As the word cloud analysis suggests that predominantly phrases like, “cost of electricity”, “reduce cost” and “electricity bill” have been used by majority of the survey respondents. In addition, the other aspect that was identified through the analysis is the environmental benefits of renewable energy projects in this regard, words like “environment”, “Sustainable Energy” were used by majority of respondents when asked about the benefits (Figure 11). So the two key reasons that the public supports this project can be summarized as below:

1. Expectation that a good change will occur to cost of electricity

2. Inherent environmental benefits of the project

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.

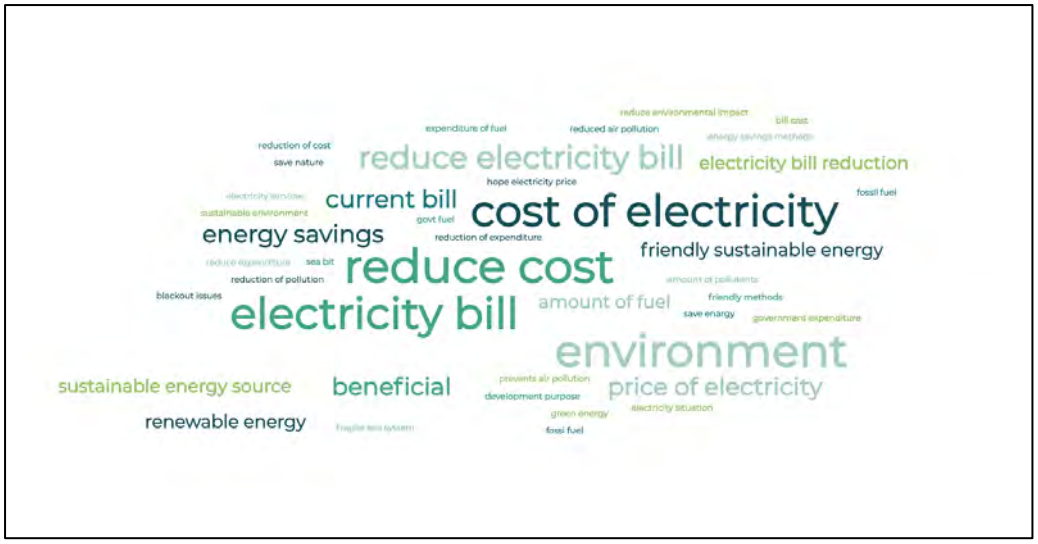



FIGURE 11 RESULTS OF THE WORD-CLOUD ANALYSIS UNDERTAKEN FOR EYDHAFUSHI SOLAR PV

Regarding grid upgradation works again the majority of the respondents, 86.6%, identified that it will be very beneficial (Figure 12). The main reason as identified through text cloud analysis include reduction in blackouts and cost of electricity (Figure 13). Another aspect that was highlighted by the survey respondents were the long-term sustainability of the energy provided to the island (Figure 13).

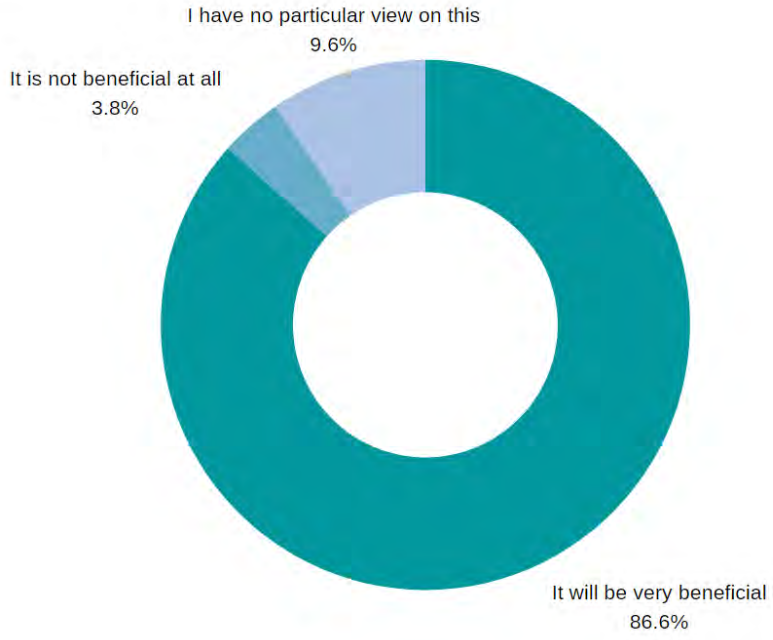



FIGURE 12 BENEFITS OF GRID UPGRADATION

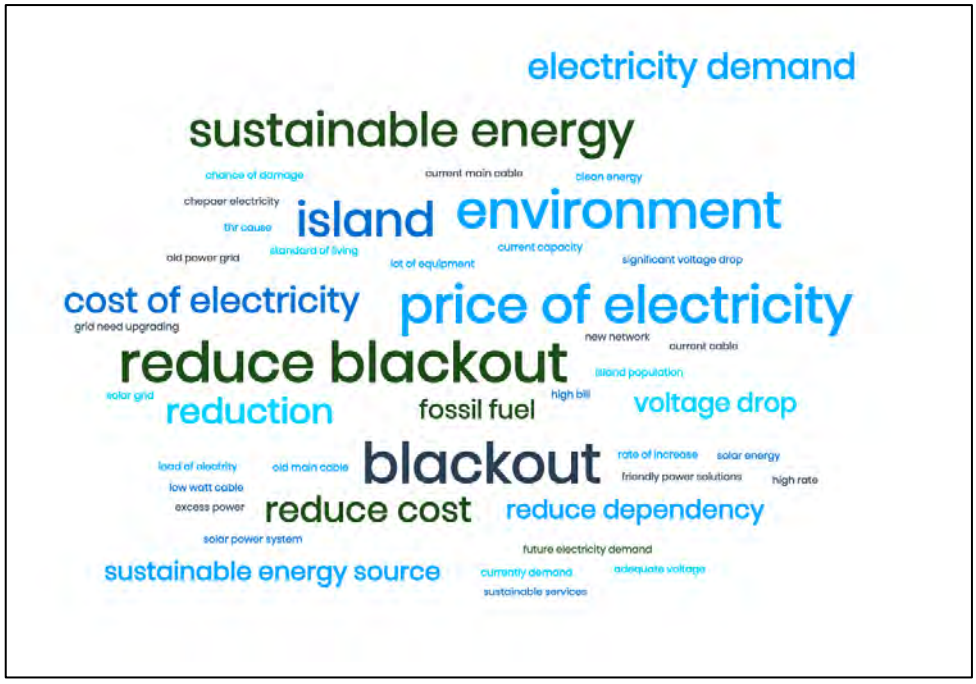



FIGURE 13 RESULTS OF WORD CLOUD ANALYSIS UNDERTAKEN FOR EYDHAFUSHI, GRID UPGRADATION

The next question in the survey is regarding the location of Solar PV installation. 77% of those who were surveyed were happy with the location of the PV installation site (Figure 14). In terms of comments not much comments were attained regarding the location, thus text analysis was not undertaken. The only concern raised by two respondents were due to impacts of salt spray as the location is close by to the sea. Marine grade construction materials are planned to be used to address for this concern.

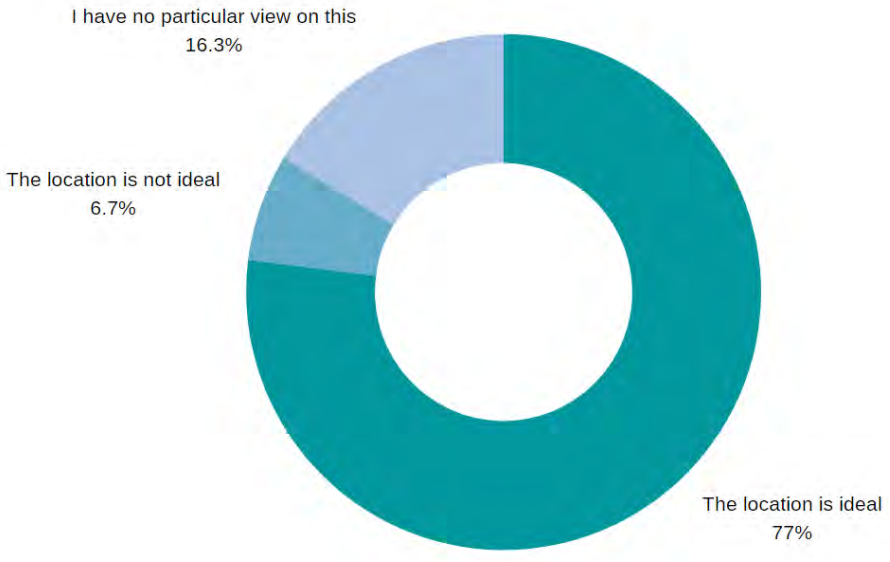



FIGURE 14 PERCEPTION REGARDING SOLAR PV INSTALLATION LOCATION

## 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.

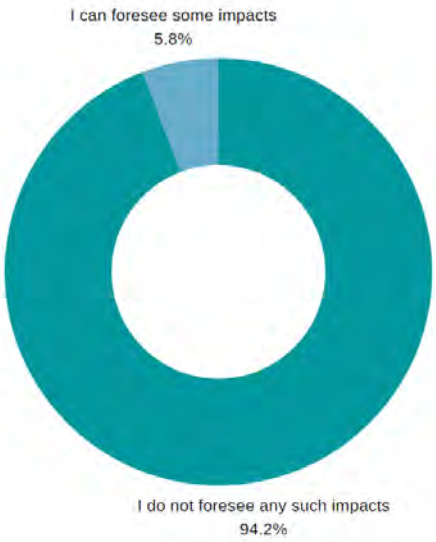



FIGURE 15 POTENTIAL IMPACTS ON PUBLIC AND PRIVATE PROPERTY AS A RESULT OF THE PROJECT

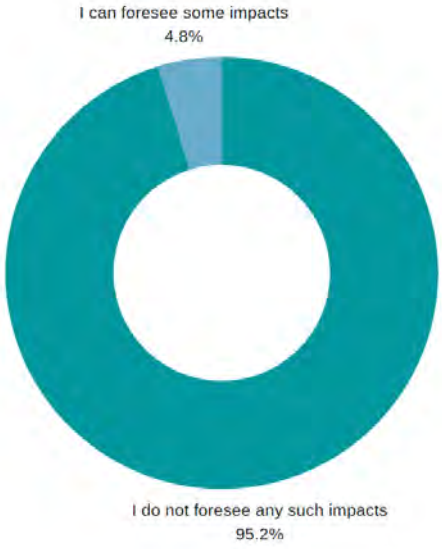



FIGURE 16 POTENTIAL IMPACTS ON THE LIVELIHOOD AS A RESULT OF THE PROJECT

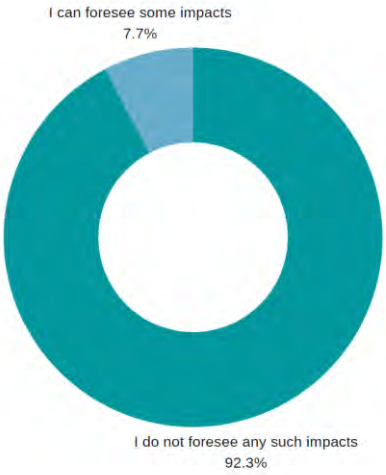



FIGURE 17 POTENTIAL IMPACTS ON SAFETY

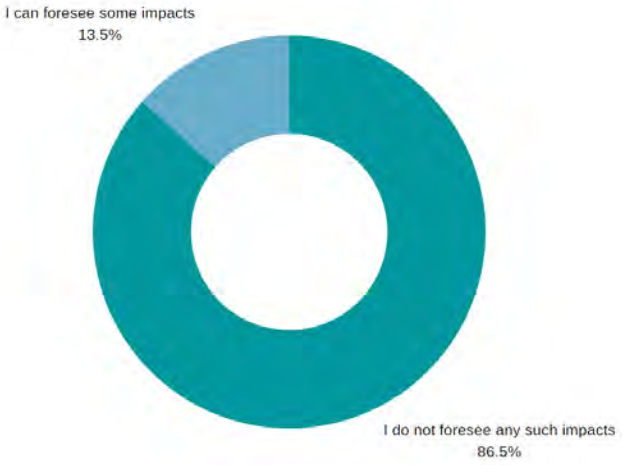



FIGURE 18 POTENTIAL IMPACTS RELATED TO LABOUR FORCE

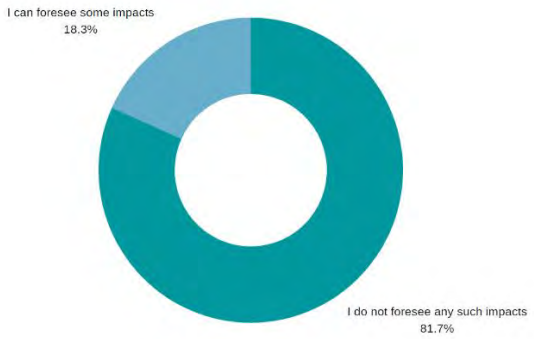



FIGURE 19 POTENTIAL IMPACTS RELATED TO VIBRATION, NOISE AND DUST

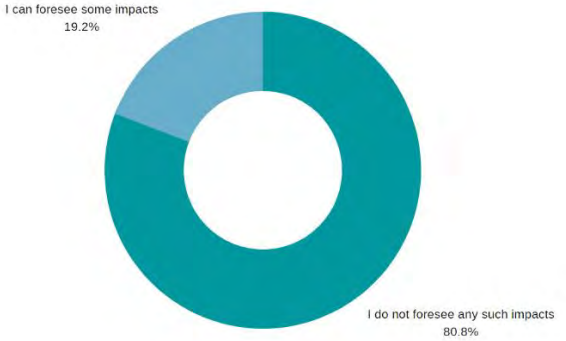



FIGURE 20 POTENTIAL IMPACTS ON TRAFFIC

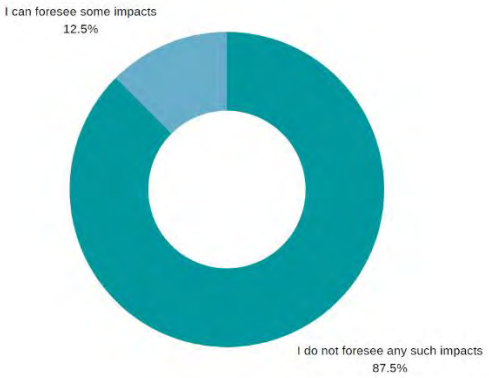



FIGURE 21 POTENTIAL IMPACTS ON VEGETATION

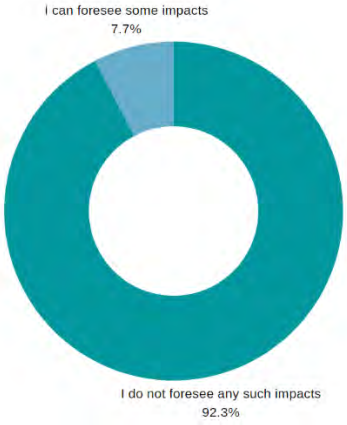



FIGURE 22 POTENTIAL IMPACTS ON GROUNDWATER

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.

| Aspect | Raised Issue or Concern |
|---|---|
| **Impacts on property** | ➢ One respondent concerned about the potential impact of lightning strike |
| **Impacts on livelihood** | ➢ One respondent highlighted that might not be able to use his pickup truck in this location |
| **Impacts on Safety** | ➢ One respondent highlighted that he is skeptical that maintenance will be done regularly<br>➢ One respondent raised the issue of panels being in a public space<br>➢ One respondent raised issue of losing space for kids to run around |
| **Impacts of labour Force** | ➢ Five respondents highlighted the importance of involving locals in the labour force<br>➢ Two respondents highlighted the importance of having good supervision on site |

| | |
|---|---|
| **Impacts on noise, vibration and dust** | ➢ One respondent highlighted the potential impacts of vibration on the houses, highlighted that some houses are very old.<br>➢ One respondent highlighted potential noise impacts on nearby houses |
| **Impacts on traffic** | ➢ Four respondents raised the issue of impacts on traffic if the traffic flow needs to be rerouted during the construction phase as a result of the project<br>➢ One respondent raised the issue of closure of solar PV installation site which is childrens play area |
| **Impacts on vegetation** | ➢ Two respondents highlighted that recently some *Casuarina equisetifolia L.* (fithuroanu) trees planted in the area may obstruct the panel installation. |
| **Impacts on groundwater** | ➢ No impacts stated by any of the respondents |

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

| Impacts | Mitigation Meausres |
|---|---|
| **Lighting strike on Solar PV** | ➢ Panels with lighting protection will need to be used for the purpose of the project |
| **Obstruction for public vehicles** | ➢ Road closure for all the activities undertaken for the project, particularly grid upgradation and Solar PV installation is expected only during construction phase.<br>➢ The PV panels will be installed such that any vehicles large or small that uses the road is not obstructed. |
| **Maintenance Issues during operational phase** | ➢ The PV panels will be installed by a private investor on a long-term contract of 15 years, it is in the best interest of the investor to undertake maintenance.<br>➢ For BESS system contractor selected for the works will be required to train Fenaka staff regarding maintenance.<br>➢ Operation and maintenance by the installation contractor supervised for a period of 01 year.<br>➢ At the end of life the Battery system needs to be transferred to a registered hazardous waste management facility by the contractor. |
| **Solar Panels being in a public space and area for kids to play** | ➢ The PV installed site will be accessible to the public underneath the panels will provide shade to those who are using the area. |
| **Involvement of Locals in the labour force** | ➢ Local staff of Fenaka will be involved in operation and maintenance of BESS<br>➢ Exposure visits and awareness campaigns undertaken for locals.<br>➢ Locals staff from Fenaka will be involved in E and S inspection during construction and operation phase. |

| | |
|---|---|
| | ➢ Investors that install solar PV will be asked to propose how they plant to employ and utilize local staff during operation and maintenance phase |
| **Vibration impacts on houses** | ➢ The project is not expected to undertake any construction activities that will cause heavy vibration impacts. |
| **Noise impacts on households** | ➢ Working hours of the contractors will be restricted to day hours from morning 06 to evening 06.<br>➢ Works that involve significant noise not expected to be undertaken as part of the project. |
| **Traffic impacts** | ➢ Road closures will be coordinated with police and the council.<br>➢ Appropriate safety signs will be installed.<br>➢ Aim to finish construction works as per the schedule. |
| **Vegetation impacts newly planted Causarina trees** | ➢ Verify the exact location of these plants, if within project footprint, coordinate with the council to relocate these plants to another area of the island prior to construction commencing. |

## 5.6 Conclusion

Based on the survey results, overall it can be seen that the public of Eydhafushi is very keen and positive regarding the project. With 98% of the public believing that Solar PV installation will be beneficial and 86.6% of the surveyed public identifying that grid upgradation and BESS installation will be 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 reduction in blackouts, long term sustainability of the energy provided and expectation regarding reduction in cost of electricity.

In terms of location, 77% of the survey respondents are happy with the location, the concern raised is primarily regarding salt spray which can be addressed by using marine grade construction material. In terms of impacts, no major concerns were raised by the public as for all the aspects raised majority of the public identified that there is no major impact or issue. The few impacts identified by some of the respondents related to access, traffic, noise, vibration, safety, vegetation and property can be mitigated by appropriate 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 Word 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 question16 briefly state the reason for this

……
……

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

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

……
……
…….

22. Do you foresee that the project may negatively impact your livelihood?
    (a) I do not foresee any such impacts
    (b) I can foresee some impacts
23. If you answered I can foresee some impacts in question 22 could you briefly describe the impacts

……
……
……..

24. Do you foresee any negative safety issues that may arise as a result of this project?
    (a) I do not foresee any such impacts
    (b) I can foresee some impacts

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

……
……
……

26. Do you foresee any negative impacts related to labor force that may occur as a result of the project?
    (a) I do not foresee any such impacts
    (b) I can foresee some impacts

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

……
……
……

28. Do you foresee any negative impacts related to dust, noise or vibration that may occur as a result of the project?
    (a) I do not foresee any such impacts
    (b) I can foresee some impacts

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

……
……
……

30. Do you foresee any negative traffic impacts that may occur as a result of the project?
    (a) I do not foresee any such impacts
    (b) I can foresee some impacts
31. If you answered I can foresee some impacts in question 30 could you briefly describe the impact

……
……
……

32. Do you foresee any negative impacts on vegetation that may occur as a result of this project?
    (a) I do not foresee any such impacts
    (b) I can foresee some impacts
33. If you answered I can foresee some impacts in question 32 could you briefly describe the impact

……
……
……

34. Could you foresee any negative impacts on ground water that may arise as a result of this project?
    (a) I do not foresee any such impacts
    (b) I can foresee some impacts

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

……
……
……

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

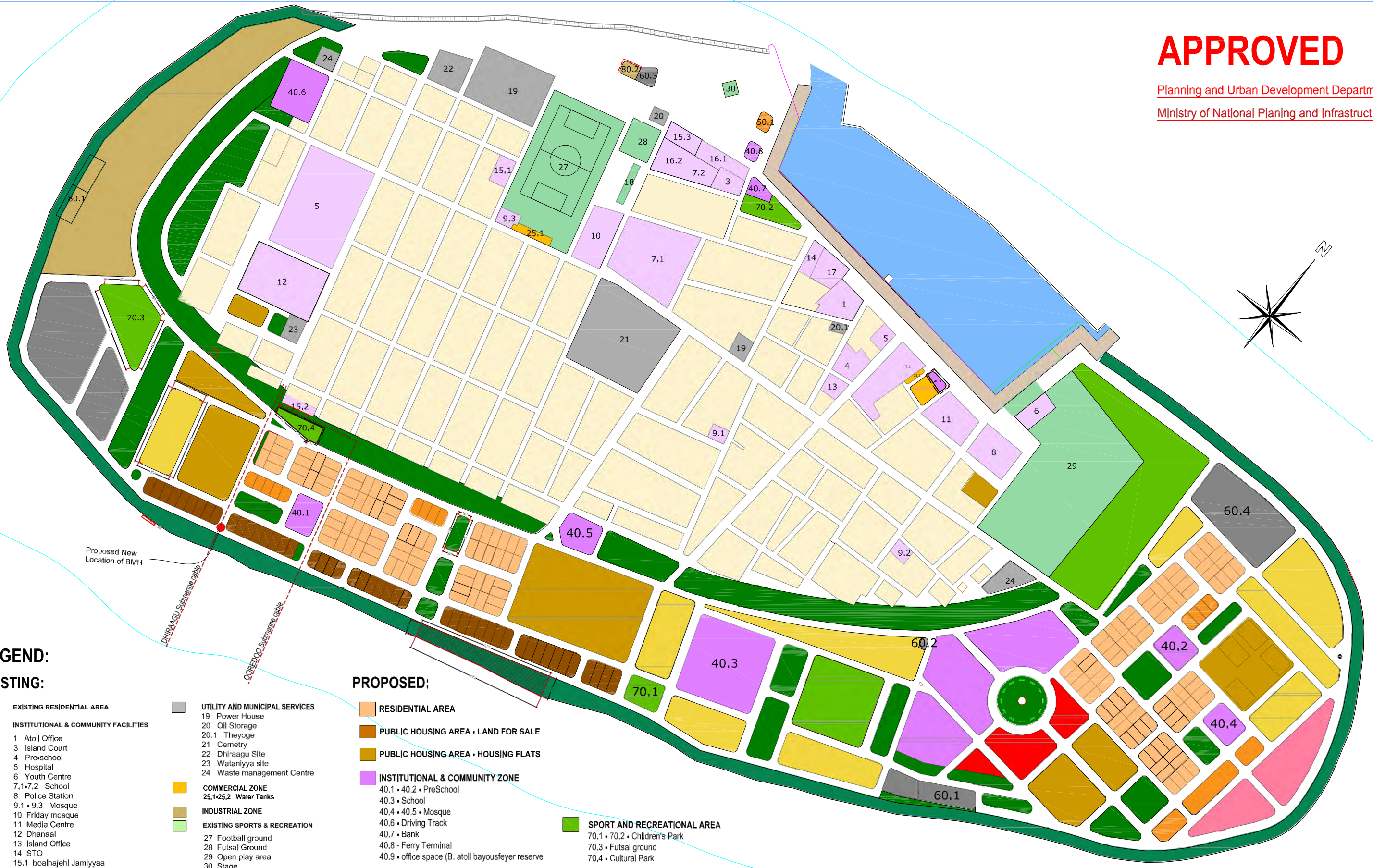
……
……
……..

# 6 Annex 5: Landuse Plan of Eydhafushi

# APPROVED

Planning and Urban Development Department

Ministry of National Planing and Infrastructure




## LEGEND:

### EXISTING:

- EXISTING RESIDENTIAL AREA
- INSTITUTIONAL & COMMUNITY FACILITIES
  - 1 Atoll Office
  - 3 Island Court
  - 4 Pre-school
  - 5 Hospital
  - 6 Youth Centre
  - 7,1-7,2 School
  - 8 Police Station
  - 9.1 - 9.3 Mosque
  - 10 Friday mosque
  - 11 Media Centre
  - 12 Dhanaal
  - 13 Island Office
  - 14 STO
  - 15.1 boalhajehi Jamiyyaa
  - 15.2 Vafaa Jamiyyaa
  - 15.3 Feyli Jamiyyaa
  - 16.1 Social Protection Centre
  - 16.2 Dhandifaru
  - 17 Multi-Purpose Centre
- UTILITY AND MUNICIPAL SERVICES
  - 19 Power House
  - 20 Oil Storage
  - 20.1 Theyoge
  - 21 Cemetry
  - 22 Dhiraagu Site
  - 23 Watanlyya site
  - 24 Waste management Centre
- COMMERCIAL ZONE
  - 25.1-25.2 Water Tanks
- INDUSTRIAL ZONE
- EXISTING SPORTS & RECREATION
  - 27 Football ground
  - 28 Futsal Ground
  - 29 Open play area
  - 30 Stage
  - 18 School Children's Park
- EXISTING HARBOUR BASIN
- OPEN/GREEN BUFFER AREAS
- ENVIRONMENTAL PROTECTION ZONE (EPZ)

### PROPOSED:

- RESIDENTIAL AREA
- PUBLIC HOUSING AREA - LAND FOR SALE
- PUBLIC HOUSING AREA - HOUSING FLATS
- INSTITUTIONAL & COMMUNITY ZONE
  - 40.1 - 40.2 - PreSchool
  - 40.3 - School
  - 40.4 - 40.5 - Mosque
  - 40.6 - Driving Track
  - 40.7 - Bank
  - 40.8 - Ferry Terminal
  - 40.9 - office space (B. atoll bayousfeyer reserve
- COMMERCIAL & RETAIL ZONE
  - 50.1 - Local Market
- UTILITY AND MUNICIPAL ZONE
  - 60.1 - Waste management
  - 60.2 - Ooredoo antenna
  - 60.3 - Water & RO Plant
  - 60.4 - Vehicle Parking Zone
- SPORT AND RECREATIONAL AREA
  - 70.1 - 70.2 - Children's Park
  - 70.3 - Futsal ground
  - 70.4 - Cultural Park
- INDUSTRIAL AREA
  - 80.1 - Boat Building / Repair
  - 80.2 - Bottling Plant
- GUEST HOUSE DEVELOPMENT ZONE
- RESERVED FOR FUTURE USE
- PARKS
- GREEN / OPEN AREAS
- EPZ
- REVETMENT


MINISTRY OF NATIONAL PLANNING AND INFRASTRUCTURE

AMEENEE MAGU, MAAFANNU 20392, MALE', REPUBLIC OF MALDIVES

TEL: 3004300 FAX: 3004301 email: planning@housing.gov.mv


**TITLE:** B. EYDHAFUSHI LAND USE PLAN

**PROJECT:** B. EYDHAFUSHI LAND USE PLAN

**DRAWN BY:** NN

**CHECKED BY:** NA

**SURVEYED BY:**

**SCALE:**

**DATE:** 15 JULY 2019

# 7 Annex 6: Land Approval Letter Translation

Maldives Land and Survey Authority,

Ministry of National Planning and Infrastructure,

Male', Republic of Maldives

To: President of South Maalhosmadulu Eydhafushi Island Council, Mr. Tholaal Abdurrahmaan,

With reference to the councils' letter number 320-PRM/431/2019/9, dated 5th September 2020;

You have (our) permission to develop a Solar PV system on the land specified in the map attached with the reference letter. Provided that;

No vegetation within 20 meters from shoreline shall be damaged and shall not obstruct public transportation in the area.

17th Muharram 1441

16th September 2019

Sincerely

Fathimath Shanna

Assistant Director

Secretariat of South Maalhosmadulu Eydhafushi Island Council

Baa. Eydhafushi

Copy: Secretariat of South Maalhosmadulu Atoll Council

Ministry of Environment

This is a true and accurate translation of its original

Hassan Shiyam Mohamed,

Legal Specialist,

ASPIRE, Ministry of Environment

# 8 Annex 7: MOU signed with Eydhafushi Council

**MEMORANDUM OF UNDERSTANDING**

between

**MINISTRY OF ENVIRONMENT**

and

**SOUTH MAALHOSMADULU EYDHAFUSHI ISLAND COUNCIL**

For commitment on mutual cooperation and support for the successful implementation of Accelerated Sustainable Private Investment in Renewable Energy (ASPIRE) Project

Ref Number:
**(AGR)438-ASPIRE/320/2020/1**

**Dated: 20th February 2020**

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**THIS MEMORANDUM OF UNDERSTANDING** (the "**MoU**") is made on the 20th of February 2019

**BETWEEN:**

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

**And,**

**SOUTH MAALHOSMADULU EYDHAFUSHI ISLAND COUNCIL**, having its office at Secretariat of Eydhafushi Council, South Maalhosmadulu, Atoll, Eydhafushi Island, Republic of Maldives (hereinafter referred to as the "**Council**").

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

WHEREAS;

A. ME is desirous of executing a Memorandum of Understanding for commitment on mutual cooperation and support between Government Agencies, State Owned Enterprises and such other stakeholders necessary for the successful execution of Project(s) (as defined hereunder) carried out by or in connection with ME on behalf of the Government of Maldives (GoM), for the successful implementation of National Government Policies related to Energy; and

B. GoM, represented by ME with the support of STRATEGIC CLIMATE FUND and the INTERNATIONAL DEVELOPMENT ASSOCIATION (IDA) has initiated a project in the Maldives titled Accelerating Sustainable Private Investment in Renewable Energy (herein referred to as "the Project" or ASPIRE), whereby private investors are invited to develop solar Photovoltaic (PV) systems on identified Site(s); and

C. For the implementation of the Project, ME and the Council has mutually identified the Site(s) to develop solar PV system in accordance with Project Framework Documents (as defined hereunder);

D. ME and the Council desire to execute this MoU for mutual support and cooperation in the successful implementation of the Project.

NOW THEREFORE, the Parties agree as follows;

1. Unless the context otherwise requires, in this MoU the following terms shall carry the meanings as set forth below;

   1.1 "Applicable Law" means any and all local policies, statutes, laws, regulations, ordinances, rules, rulings, judgments, orders, decrees, Authorizations, licenses or other governmental requirements or restrictions or any interpretation or administration of any of the forgoing, in effect at the time of entering into this MoU or shall come in to force in the future, in the jurisdiction of Republic of Maldives.

   1.2 "Authorizations" means permits, approvals or licenses required for the execution of the Project(s).

1.3 "Donor" means International Development Association of World Bank.

1.4 "GoM" means Government of Maldives constituted under the Constitution of Maldives and shall include all the ministries, departments, authorities, agencies and persons thereto.

1.5 "Government Agencies" means Ministry of Environment, Maldives Energy Authority, other government ministries, departments, State Owned Enterprises, statutory bodies and regulatory bodies with any jurisdiction over the implementation of the Project(s) and involved in the provision of Energy, and protection of the Environment under Applicable Law in the territory of the Republic of Maldives.

1.6 "GRM" means the Grievance Redress Mechanism prepared as may be agreed between the Parties for the purpose of resolving social issues or grievances arising out of or in connection with the Project Framework Documents.

1.7 "Investor(s)" means local and international private parties procured by GoM through ME or Ministry of Finance, to execute the Project.

1.8 "ME" means Ministry of Environment and shall include the Maldives Energy Authority administered under ME and other departments, authorities, agencies, representatives and persons thereto.

1.9 "Project" means ASPIRE, and any phase or sub-projects thereof.

1.10 "Project Framework Documents" means all bid documents, letters of tender, Agreements, and all such other documents and communications related to the Project.

1.11 "Site(s)" means the roof-top(s) and/or the terraces of the building(s) and such other public spaces mutually identified in Baa. Eydhafushi 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 Eydhafushi 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

2.1.3 fully comply with the provisions of the Site Agreement(s), and carryout such actions, without any undue delay, as maybe required by ME or any other party to the Project Framework Documents to enable such parties and GoM to comply with the Project Framework Documents in the performance of their obligations thereunder; and

2.1.4 fully cooperate with ME, the Investor(s) and such other parties to the Project Framework Documents where necessary, upon any reasonable request by such party in the performance of their obligations under the Project Framework Documents; and

2.1.5 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

2.1.6 disclose to ME such other information related to the Project, without delay, upon any reasonable requests made by ME from time to time; and

2.1.7 carry out such actions on its part to enable the parties to the Project Framework Documents to obtain any and all Authorizations required for the execution of the Project under the said Documents.

2.2 ME hereby undertakes to;

2.2.1 provide necessary support in facilitating adequate resolution of issues or disputes arising out of or in connection with the Site Agreement(s) and in the maintenance of Site(s), in accordance with the provisions of the Site Agreement(s), the GRM and other Project Framework Agreements; and

2.2.2 ensure that no costs arising out of or in connection with the Project shall be borne by the Council, during the subsistence of the Site Agreement(s).

3 This MoU shall be effective from the date above mentioned and shall continue in full force unless terminated by either Party upon providing reasonable written notice to the effect or upon determination of the Site Agreement(s), as specified therein.

4 The Parties shall appoint a person(s) as a focal point in their organization for the implementation of this MoU and shall inform one another of such appointment.

5 All communications pursuant to this MoU, unless otherwise agreed, shall be exchanged in writing and delivered by person or via Government E-letter Management System (GEMS), email or legible facsimile transmission to the addresses set forth below, or to such other addresses, email or telefax numbers either Party duly inform in writing from time to time.

**For ME**

Name: Mr. Ajwad Musthafa
Designation: Permanent Secretary
Address: Green Building,

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

**For the Council**

Name: Tholal Abdul Rahman
Designation: Council President
Address: Secretariat of Eydhafushi Council, Baa. Eydhafushi
Email: eydhafushi@baa.gov.mv
Fax: +960 6608503

6 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.

7 Any issues or disputes arising out of, relating to, or in connection with this MoU shall be resolved through amicable negotiations among executives or management of the Parties appointed by the Parties for the purpose.

8 Parties hereby agree that it is their intention that this MoU shall be executed and delivered in good faith between the Parties and to the best interests of GoM and that if, either Party believes that the other Party is operating in breach of this MoU, or to the detriment of the interests of GoM, the Parties will use their best efforts to agree on such action as may be necessary to amicably remedy such breach or actions.

9 The Parties agree that they will hold in confidence the provisions of this MoU, all information, documentation etc., which comes to their knowledge in the course of implementing this MoU (the "Confidential Information").

10 The Parties agree not to disclose any Confidential Information without the other Party's prior written consent provided that the Confidential Information may be disclosed to any governmental or regulatory authority requiring such disclosure under law.

11 The Parties agree not to publicize at any time, including making public announcements or press statements or issuing press releases of any kind or release any information related to or about this MoU without the other Party's prior written consent.

12 This MoU shall be governed by and construed in accordance with the laws of Republic of Maldives.

IN WITNESS THEREOF, the parties hereto, acting through their duly authorized representatives have caused this Memorandum of Understanding to be signed in Male' City on the 20th day of February 2020.

**For and on behalf of ME**

Name: Dr. Hussain Rasheed Hassan

Designation: Minister of Environment

Date: 16/03/2020

*Signature & Seal*

**In the Presence of:**

Name: Hassan Shiyam Mohamed

ID Card Number: A093600

*Signature*

**For and on behalf of the Council**

Name: Tholal Abdul Rahman

Designation: Council President

Date: 20th February 2020

*Signature & Seal*

**In the Presence of:**

Name: Ibrahim Shifau

ID Card Number: A215049

*Signature*

## ANNEXURE

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

## Eydhafushi (ASPIRE Site)

# 9 Annex 8: Grievance Redress Mechanism of the project

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

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

| **Tiers of Grievance Mechanism** | **Nodal Person for Contact** | **Contacts, Communication and Other Facilitation by Project** | **Timeframe to address grievance** |
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| **First Tier: Site level**<br>Contractor (During Construction phase)<br>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. | • 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.<br>• 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 on the websites of the IPP or ESP or Contractor, Ministry of Environment (ME) and from the front office counters of the | 14 working days |

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| | | respective offices. (note PMU of ME should supply the form to respective parties).<br>• For those who cannot properly write, a staff will assist in filling the complaint form and get it signed by the aggrieved party.<br>• A formal receipt of the complaint will be provided to the aggrieved party.<br>• The IPP/ESP/Contractor will screen the grievance to determine whether the grievance is related to ARISE project or not.<br>• 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.<br>• 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 | |

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| | | 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.<br>• 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.<br>• 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<br>is unable to read (for whatever reason) the issued letter should be read to the person in presence of a witness and the witness should declare their witness to this event. | |

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| | | • The aggrieved party must acknowledge the receipt of decision and submit their agreement or disagreement with the decision within 10 days.<br>• If no acknowledgement is submitted from the aggrieved party then the decision will be considered as accepted.<br>• 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. | |
| **Second Tier: Local Council** (Island or City Council or any other party which performs such a function) | Local Council will be the second point of contact. Designated contact persons should be established within the Council with a designated contact number. | • 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 days the grievance can be upgraded to tier 2.<br>• 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.<br>• Grievances can be registered by contacting the local council | 14 working days |

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| | | 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).<br>• For those who cannot properly write, a staff will assist in filling the complaint form and get it signed by the aggrieved party.<br>• A formal receipt of the complaint will be provided to the aggrieved party.<br>• The aggrieved party will submit a copy of the decision from tier 1 and the letter submitted raising their disagreement to decision where the reason for upgrading to tier 2 is the disagreement with the decision from tier 1.<br>• 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. | |

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| | | • The council will screen the grievance to determine if the issues and concerns raised in the complaint falls within the mandate of the project.<br>• 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.<br>• 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 | |

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| | | declare their witness to this event.<br>• 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.<br>• 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 issued letter will be read to the person in presence of a witness and the witness should declare their witness to this event.<br>• The aggrieved party must acknowledge the receipt of decision and submit their agreement or disagreement with the decision within 10 days.<br>• If no acknowledgement is submitted from the aggrieved party then the decision will be considered as accepted.<br>• If the grievance is not resolved to the satisfaction of the | |

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| | | aggrieved party within 14 working days of submission of the grievance to tier 2 then the aggrieved party may notify ME, in writing, of the intention to move to tier 3. | |
| **Third Tier**: Ministry of Environment and Energy | ME will forward the grievance to the Project Management Unit (PMU) of the Ministry. A dedicated number should be allocated to | • 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. 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.<br>• For those who cannot properly write, the ME staff will fill a complaint form and get it signed by the aggrieved party.<br>• A formal receipt of the complaint will be provided to the aggrieved party.<br>• 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 | 14 Working Days |

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| | | the disagreement with the council decision.<br>• 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.<br>• Ministry will forward all the grievances related to the project to the Project Management Unit.<br>• PMU will screen the grievance to determine if it is related to the project.<br>• 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.<br>• 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 | |

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| | | 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.<br>• 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.<br>• 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.<br>• 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 | |

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| | | presence of a witness and the witness should declare their witness to this event.<br>• The aggrieved party must acknowledge the receipt of decision and submit their agreement or disagreement with the decision within 10 days.<br>• If no acknowledgement is submitted from the aggrieved party then the decision will be considered as accepted. | |

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 |
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| Company: | |
| To: | |
| Address: | |
| E-mail: | |
| Website: | |
| Telephone: | |

# 10 Annex 9: Indicative Mitigation Plan For the Identified Risks

| Aspect | Indicative Mitigation Measures |
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| Construction Site and Construction Workers | • All provisions that are required under Health and Safety Regulation for Construction Industry (2019/R-156) should be strictly adhered.<br>• All workers should be provided with Personal Protective Equipment (PPE) by the contractor/Investor. In this regard the following needs to be observed:<br>• Hard hats should be used by all workers when undertaking construction and when undertaking inspections at height.<br>✓ Enclosed safety shoes should be worn by all construction workers.<br>✓ Safety harness should be used by all workers when climbing heights at project sites.<br>✓ Electrical Protective gloves should be provided to workers when dealing with electrical components.<br>✓ Chemical protective gloves should be provided to all workers when dealing with any chemicals.<br>✓ Construction safety goggles should be worn by all construction workers.<br>✓ Ear plugs should be worn by all construction workers working in environments with high noise (working above 75 decibles).<br>✓ Masks should be worn when dealing with chemicals and when working in dusty environments.<br>• All chemicals should be stored on hard surfaces and should be covered.<br>• Portable drinking water should be available at the construction site during construction phase.<br>• 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.<br>• Construction work site should be demarcated & fenced, and warning signs should be displayed both in English and Dhivehi.<br>• When construction is undertaken clearly demarcated bins for waste disposal needs to be placed and emptied daily.<br>• Open pits should not be left for water to accumulate for a long time.<br>• Any stockpiled sand needs to be covered to prevent sand particles from being airborne.<br>• All vehicles and equipment used for the project needs to be used by well trained personnel.<br>• Any scaffolding used should be to British Standard (BS1139).<br>• When working at night adequate lighting should be provided. |

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| | • A designated toilet facility should be available within 10 minutes of the construction site.<br>• Breaks should be given to the workforce during mealtimes.<br>• Fire fighting equipment should be available at the construction site, at the workers accommodation and any storage areas used for the project.<br>• The site needs to be cleaned daily following completion of days work.<br>• The maximum working hours of all construction workers should be 48 hours per week as per the Employment Act of Maldives. |
| Storage and use of hazardous chemicals | • 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.<br>• Stored containers should be regularly inspected to identify any leakages.<br>• The storage for any hazardous material and any refueling activities should be undertaken outside the 20m Environmental Protection Zone of the island.<br>• Any hazardous material storage areas should have fire fighting equipment.<br>• 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.<br>• All activities should be undertaken in presence of an experienced supervisor.<br>• Chemical protective gloves, goggles, masks and safety shoes need to be worn when handling any hazardous material. |
| Transport, handling and Storage of Solar PV | • Mechanical equipment (forklift) should be used when handling the containers with PV Panels during transport.<br>• When moving packaged boxes to construction site, forklift should be used.<br>• Transport should be coordinated with island council and Police.<br>• 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.<br>• If the wind is too heavy avoid handling solar panels<br>• The box should be placed horizontally to avoid tilting.<br>• All staff involved in transport, storage and handling of Solar PV should wear gloves, safety shoes, safety goggles and hard hats.<br>• Do not step on cartons containing PV modules |
| Operation of Batching plant | **1. Maintenance of the general site operations**<br>• Maintain all the equipment including dust collection equipment to prevent any leaks. |

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| | • Concrete batching operation needs to be undertaken away from residential locations to minimize dust and noise impacts.<br>• All concrete mixing operations should be undertaken during daytime to minimize noise impacts.<br>• All staff involved in batch plant operation should wear, safety hats, dust masks, safety shoes, goggles and gloves.<br>• Required safety signs should be installed at the batching plant site with warnings for dust and noise highlighted.<br><br>**2. Material handling and storage**<br>• Aggregates and sand required for concrete mixing should be handled and stored in an enclosed space. Enclosed storage bins or enclosed sealed bags.<br>• As much as possible avoid using chemical concrete additives since they are more toxic. Instead, use sugar or wood based admixers.<br>• Where chemical additives are approved to be used, need to store them in an enclosed space on a hard-impermeable surface.<br><br>**3. Mixer feed operations**<br>• Use the enclosed batch mixer feed as dust prevention and visible emissions.<br>• Use the spray device to prevent dust emissions.<br>• Conduct all the mixing operations from an enclosed space to help prevent emission of dust.<br><br>**4. Conveyors**<br>• To prevent dust emissions, the belt conveyors should be enclosed on both sides.<br>• All conveyor transfer points should be enclosed by fitting the flexible seals to prevent dust.<br>• The turning point of any conveyor should be provided with scrappers to prevent dust collection on the surface belt<br><br>**5. Mixing and loading operations**<br>• Loading concrete should be in such a way that minimizes dust emissions.<br>• All the air borne dust emission generated by material loading and mixing operations should be vented to fabric filtering system.<br>• 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.<br><br>**6. Fugitive dust**<br>• Use water sprays or dust suppression agents to reduce dust.<br>• An air extraction and filtration system for collecting the generated dust should be installed.<br><br>**7. Waste concrete**<br>• Collect the waste concrete in suitable washout pits where it becomes gravel, sludge and sand which can later be reused.<br><br>**8. Waste water**<br>• Waste and contaminated water should be directed to onsite settling ponds and it can be reused later in for dust control, rinsing trucks exteriors. |

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| Vegetation Removal and levelling | • Where trees and palms fall within the project footprint, option to relocate any trees and palms should be considered first.<br>• 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.<br>• No vegetation within the 20 m coastal zone should be removed for the purpose of the project.<br>• No protected trees should be removed as part of the project.<br>• Any construction area needs to be levelled to preexisting levels. |
| Solid and construction waste during construction phase | • For domestic waste produced by the staff clearly demarcated bins for waste disposal needs to be placed and emptied daily.<br>• For construction solid waste should be cleared from work site every day and placed in a designated location. |
| Solar Panel waste following lifetime | • The panels should be either recycled or taken to a certified e-waste management facility. Preference should be given to recycling. Prior approval needs to be attained from Ministry prior to undertaking this activity. |
| Emissions from vehicles | • All vehicles used for the project should have an up to date road worthiness. |
| Dust, Noise and Vibration | • Restricting working hours from morning 06 to evening 06.<br>• Keeping construction equipment properly stored and secured at a location approved by the council<br>• 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.<br>• Ensure that the construction site is wetted regularly to minimize impact of dust as a result of the project. |
| Groundwater | • All chemicals used should be stored on hard surfaces on enclosed spaces.<br>• All chemicals should be handled using chemical protective gloves.<br>• All storage containers need to be inspected regularly for any leaks.<br>• Where dewatering is required, the dewatering permit should be attained as per the requirements of Dewatering Regulation (R-1697/2013).<br>• Dewatering activities where required needs to be completed within the shortest possible time. |
| Road closure and road safety | • All closures need to be preannounced<br>• All road closures need to be coordinated with the council and Police<br>• Clear markings need to be placed on roads during road closure with indicative lights and warning signs.<br>• Following backfilling and resurfacing where required, must ensure that preexisting levels are maintained. |

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| | • The solar panels need to be placed at a height and angle such that glare doesn't become an issue for the vehicles. |
| Impacts on recreational spaces close to installation site | • The construction work should be limited to the footprint of the planned PV installation.<br>• No equipment, vehicles should be left unattended.<br>• Area in which construction work is undergoing should be closed off for public access.<br>• Appropriate safety signs should be placed at the construction site in both English and Dhivehi. |
| Damage to Utility lines and other cables | • The investor/contractor should come into agreement with each and every service provider regarding how any damage is going to be fixed.<br>• Identify the cable routes, utility lines prior to construction commencement and ensure that such areas are avoided.<br>• Where chance damage occurs the investor needs to make arrangements to fix the damage within 24 hours of damage. |
| Labour related impacts | • If foreign labour is used the labour force needs to be briefed on the language, culture and customs of Maldives.<br>• It is imperative that the comprehensive Labour Management Procedures (LMP) developed for the project is followed (link: https://www.environment.gov.mv/v2/en/download/10026)<br>• Constant and reliable electricity supply should be available at project office and accommodation site.<br>• Shower and toilet facilities should be available at temporary accommodation site.<br>• Toilet and drainage should be connected to local sewer system, where not available septic tanks should be used for treatment prior to disposal.<br>• A minimum ratio of 01 toilet/shower per 20 workers should be maintained. Separate facilities should be provided for men and women.<br>• Individual bedding should be provided to all workers.<br>• Storage space for individual belongings should be provided for all workers.<br>• Male and Female workforce needs to be housed separately.<br>• Designated locations for waste disposal with clearly marked bins needs be established. Bins need to be emptied daily.<br>• Sufficient lighting and cooling systems need to be established.<br>• Portable drinking water should be provided.<br>• The site needs to be cleaned daily.<br>• Monthly inspections to determine pest infestation of the site should be undertaken.<br>• Meals if prepared from a local café or restaurant should be from a Maldives Food and Drug Authority certified facility.<br>• If foreign labor is used, prior to mobilization the construction workers should be briefed in their language on customs of Maldives.<br>• If Covid19 restrictions are in place all guidelines issued by Health Protection Agency of Maldives need to be followed. |

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| | • 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. |

# 11 Annex 10: Risk Matrix

| **Construction phase** | | | | | | |
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| **Risks** | **Party at risk** | **Probability** | **Significance** | **Overall score Risk Score** | **Risk Level** | **Comments** |
| Vegetation Clearance | Environment | 1 | 5 | 6 | Low | As reclaimed land no vegetation found at the site at present |
| 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 |

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| 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 |

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| 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 |

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|---|---|---|---|---|---|---|
| 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 | Workforce | 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 |

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| Lack of clearly demarcated designated areas for waste disposal at the project site (s) | Environment/Public | 5 | 8 | 13 | Moderate | Can be managed with proper mitigation measures/supervision |
| 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 |

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| 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 |