EIA for the Proposed Digital Terrestrial Television Broadcasting Network Development Project

Prepared by:
Energy Consultancy Pvt Ltd

Prepared for:
Public Service Media
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1. **Proponent's Declaration and Commitment**

   Environmental Protection agency
   Handhuvaree Hingun,
   Malé
   Republic of Maldives

   Date 11 Feb 2018
   Ref: PSM ET/203/2018/1

   **Proponent Declaration and Commitment:**

   This is to confirm as the proponent of the proposed Digital Terrestrial Television Broadcasting Network Development Project, that we have read the report and to the best of our knowledge that the information provided in the report in relation to the proposed project (project description activities, operation of the facility) are accurate and complete. We hereby confirm our commitment to finance all mitigation measures recommended and specified in the report.

   Sincerely,

   Abdulla Siyad
   Manager - Projects
2. **Consultant's Declaration**

This EIA has been prepared according to the EIA Regulations 2012, issued by the Ministry of Environment and Energy. We certify that the statements in this EIA study are true, complete and correct, to our best of knowledge and ability.

Signature: [Signature]

Name: Dr. Zahid

Date: 11 February 2018
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(4/93 एन. एल.एन.सी. (एनएलएनसी) के लिए श्रमलाना अनुमोदन दिया गया था) जिन में से 237 जोहर होठ।

(4/93 एन.एलएन.सी. (एनएलएनसी) के लिए श्रमलाना अनुमोदन दिया गया था) जिन में से 237 जोहर होठ।

(4/93 एन.एलएन.सी. (एनएलएनसी) के लिए श्रमलाना अनुमोदन दिया गया था) जिन में से 237 जोहर होठ।

(4/93 एन.एलएन.सी. (एनएलएनसी) के लिए श्रमलाना अनुमोदन दिया गया था) जिन में से 237 जोहर होठ।
5. Executive Summary

Public Service Media (PSM) is undertaking the project to mount communication towers in 22 sites to improve Digital Terrestrial Television Broadcast (DTTB). Based on the Decision statement issued on Environmental screening by EPA, out of 22 sites, only 9 sites are required to do an EIA before the project work begin on the sites, and they are Ha. Dhidhdhoo, HDh. Kulhudhuffush, Sh. Funadhoo, N. Manadhoo, ADh. Dhangethi, V. Felidhoo, Th. Guraidhoo, L. Gan and GDh. Fiyori.

In each of these islands a communication tower of heights from 40 meters to 90 meters, with a service station with two story height would be constructed.

This EIA is a requirement under 5th clause of the Environmental Protection and Preservation Act (law 4/93) and PSM as the proponent of this project gives their full commitment to undertake all the mitigation prescribed by this EIA for the adverse impact that may cause from the various components of this project.

Apart from undertaking this EIA, the proponent needed to take dewatering permit from EPA prior to dewater in order to carry the required dewatering during construction of the foundation.

In general, the existing environment of the sites allocated in these nine islands includes few matured trees and coconut palms with tall and medium size of bush grasses. In order to erect the towers the trees and grasses will be removed. From nine islands a total of 237 trees will be removed to clear the nine sites.

The main impact to from the project activities were identified is to be depletion of groundwater due to dewatering during foundation work. However this depletion would be very short, infect, it would be restricted to the duration of dewatering. Once the dewatering is stopped, the groundwater will resume being normal through evenly distribution of the existing water lens and also infiltration takes place during rainfall. Loss of species of fauna and flora would be none due to the vegetation clearance. Apart from this, proper mitigation such as piling around the foundation bed would be done to reduce horizontal water flow and to prevent possible landslide.

In conclusion, in order to complete DTTB network, PSM required to upright the communication antennas on these nine islands. Without these nine antenna, there will be a gap between the rest of the network, therefore without theses antennas the network will not function properly.
6. Introduction

Public Service Media, hereafter referred as PSM is undertaking the project to mount communication towers in 22 sites to improve Digital Terrestrial Television Broadcast (DTTB). Based on the Decision statement issued on Environmental screening by Environmental Protection Agency (EPA), out of 22 sites, only 9 sites are required to do an Environmental Impact Assessment (EIA) before the project work begins on the sites. The nine sites are located in the following islands

1. Ha. Dhidhdhoo
2. HDh. Kulhudhuffush
3. Sh. Funadhoo,
4. N. Manadhoo
5. ADh. Dhangethi
6. V. Felidhoo,
7. Th. Guraidhoo
8. L. Gan
9. GDh. Fiyori,

Since the allocated 9 out of 22 sites required an EIA, under 5th clause of the Environmental Protection and Preservation Act (law 4/93), PSM has engaged Energy Consultancy for undertaking EIA for the project and obtaining the Environmental Decision Statement (EDS) from the Environmental Protection Agency (EPA).

The main purpose of this exercise would be come up with appropriate mitigation plan for predetermined significant impacts in construction and operational phase of the project so that proponent can mitigate during both phase. One of the outcomes of this exercise would be setting out of proper monitoring plan to address the diverse effect to environment from the project throughout a given timeframe.

In order to determine the scope of this EIA, an application was submitted to EPA on 29 March 2017. Based on this application a scoping meeting was held at EPA on 18 April 2017, in which the
draft TOR submitted by the consultant with the Application was finalized and issued on 23 April 2017.

The EPA has given the direction for the scope of this exercise and main tasks of those scopes that been directed through the approved Terms of Reference include the following:

6.1. Tasks

6.1.1. Task 1: Description of the Proposed Project
Under this task the consultant described project locations and different inputs and outputs of the project. Consultant has also given a brief methodology of different works carried out on site and also machineries used by the contractor. Consultant has also addressed the temporary settlement and the safety of the workers during the implementing stage.

6.1.2. Task 2: Description of the Environment
The consultant undertook exercises in order to determine the existing terrestrial environment of the sites allocated to the project

6.1.3. Task 3: Legislative Regulatory Considerations
All the legislation prescribed for the project was addressed including the Government policies, guidelines, regulations and law of Maldives.

6.1.4. Task 4: Potential Impacts of the Proposed Project
All the significant and insignificant impacts due to inputs outputs of the project was identified and described in this task. All the positive and negative impacts was determined.

6.1.5. Task 5: Analysis of Alternative to the Proposed Project
Including No Project alternative, several alternatives has been discussed in this task.

6.1.6. Task 6: Mitigation and Management of Negative Impacts
For any negative impact that has been identified in the Task 4 of this exercise, required mitigations and how negative impact could be managed has been identified in this task.
6.1.7. **Task 7: Development of a Monitoring Plan**
Under this task an appropriate monitoring plane including the coast of different components were outlined.

6.1.8. **Task 8: Stakeholders Consultation and Inter-Agency Coordination**
The Stakeholders Consultation including consultation on Inter-Agency Coordination was carried out with different stakeholders during this exercise.

6.2. **Limitation**
Accept the information obtained on site during the field visit, all the information, including the design of the various components are secondary data obtained through the proponents, relevant authorities and locals through consultation with stakeholders. The site drawing(s) provided within this report is provided by the proponent of this project. Hence, due to unavailability of long term site-specific data, the impact assessment methodology has been restricted to field data collected, consultations, experience and professional judgment.

6.3. **Environmental Consultant of the project**
Energy Consultancy Pvt. Ltd. is a private environmental and energy consultancy firm registered in Maldives. Energy Consultancy Pvt. Ltd. is dedicated firm which has undertaken several Environmental Assessments for various types of projects. Similarly the Energy Consultancy Pvt. Ltd. has provided consultancy in various projects that has been undertaken by the government as well as private owners.
7. Policy, Legal and Administrative Framework

For nine location among 22 selected for the project, it conforms to the requirements of the Environmental Protection and Preservation Act of the Maldives, Law no. 4/93. The EIA has been undertaken in accordance with the EIA Regulation 2012 of the Maldives. Through this EIA, it has been found that the following Laws, Regulations, Policies and convention are relevant to this project.

Table 7.1 Legal Framework

<table>
<thead>
<tr>
<th>Law / Regulation</th>
<th>Relevant Article</th>
<th>Description in general</th>
<th>Action/ Requirement/ Permit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Protection and Preservation Act</td>
<td>5(a)</td>
<td>It states that an EIA shall be submitted to Ministry of Environment before implementing any developing project that may have a potential impact on the environment.</td>
<td>This EIA is submitted to fulfill this requirement</td>
</tr>
<tr>
<td>Environmental Impact Assessment Regulation 2012</td>
<td>All</td>
<td>guides the process of undertaking the Environmental Impact Assessment in the Maldives</td>
<td>Decision Statement</td>
</tr>
<tr>
<td>Waste management Regulations</td>
<td>All</td>
<td>Ensuring safe disposal of solid waste</td>
<td>Waste produce must be disposed to designated Area. No permit</td>
</tr>
</tbody>
</table>
**Table 7.2: Policies and Conventions**

<table>
<thead>
<tr>
<th>Policy / Convention</th>
<th>In General</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Biodiversity Strategy and Action Plan 2016-2025 (NBSAP 2016-2025)</td>
<td>The following were Addressed</td>
</tr>
<tr>
<td></td>
<td>• threats to biodiversity</td>
</tr>
<tr>
<td></td>
<td>• conservation of Biodiversity</td>
</tr>
<tr>
<td></td>
<td>• equality of sharing benefits arising</td>
</tr>
<tr>
<td></td>
<td>• sustainable use</td>
</tr>
<tr>
<td></td>
<td>• gaps, challenges and constraints</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Regulation on cutting down, uprooting, digging out and export of trees</th>
<th>2 (a)</th>
<th>It demand planting of two palms for every palm tree that is cut or uprooted</th>
<th>Any tree that can be relocated would be done so.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5(a)</td>
<td>It states that prior to the commencement of any project(s) that would require the indiscriminate removal and export of tree/palms from one island an EIA is required to be approved by Ministry of Environment</td>
<td>This report is fulfilling the requirement</td>
<td></td>
</tr>
<tr>
<td>8 (a)</td>
<td>Permission be obtained from Ministry of Environment, if more than 10 coconut palms that are of a height of 15 ft (from base of the palm to the tip of the palm frond) are cut, uprooted or relocated to another island.</td>
<td>The DS obtained for this EIA will be the required permit under this</td>
<td></td>
</tr>
</tbody>
</table>

| Dewatering Regulation | All | A permit needed to be obtained from EPA before commencing the dewatering | Need to obtain Dewatering Permit |

Dewatering Permit

Need to obtain Dewatering Permit
During implementation of various activities of the project, necessary care would be given to ensure that the national biodiversity strategies are adhere to.

<table>
<thead>
<tr>
<th>Climate Change Convention and Kyoto Protocol</th>
<th>The Maldives is a party to the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol to the UNFCCC</th>
</tr>
</thead>
</table>
| Objective of the Convention                 | - stabilize greenhouse gas concentrations  
                                           | - maintain the greenhouse gas inventory |
| Thus, energy efficiency and less burning of fuel need to be ensued by the actions of this project. |

<table>
<thead>
<tr>
<th>Convention on biological Diversity</th>
<th>The Maldives is a party to the United Nations Convention on Biological Diversity.</th>
</tr>
</thead>
</table>
| The objective                               | - Conservation of biological diversity,  
                                           | - Sustainable use of its components  
                                           | - Fair and equitable sharing of the benefits arising out of the utilization of genetic resources,  
                                           | - Appropriate access to genetic resources  
                                           | - Appropriate transfer of relevant technologies, |
Table 7.3: Responsible Institutions

<table>
<thead>
<tr>
<th>Institute</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Protection Agency (EPA)</td>
<td>• Regulate Environmental Sector and Water and sewerage sector</td>
</tr>
<tr>
<td></td>
<td>• Enforce the</td>
</tr>
<tr>
<td></td>
<td>o Environmental Protection and Preservation Act and various regulation for</td>
</tr>
<tr>
<td></td>
<td>o Environmental Impact Assessment Regulation 2012</td>
</tr>
<tr>
<td></td>
<td>o Waste management Regulations</td>
</tr>
<tr>
<td></td>
<td>o Dewatering Regulation</td>
</tr>
<tr>
<td>Ministry of Environment and Energy</td>
<td>• Formulate Policies, Regulations for Environment, Water and Energy Sector</td>
</tr>
<tr>
<td></td>
<td>• Implement Environmental Protection and Preservation Act</td>
</tr>
<tr>
<td>Public Service Media (PSM)</td>
<td>• Providing Radio and Television Service</td>
</tr>
<tr>
<td>Maldives Broadcasting Commission</td>
<td>• Regulate all type of media which has ability to broadcast</td>
</tr>
</tbody>
</table>
8. The Project

8.1. Project Proponent
The Public Service Media (PSM) was formed as a Public Service Company under the Public Service Media Act (9/2015) on 28th April 2015. PSM is the official State Media in the Maldives. The Public Service Media Act obligates PSM to provide TV, Radio, Online and Print Media services to the general public. PSM’s basic responsibility is to create awareness among the public in providing news and infotainment.

The Public Service Media reserves the right through the Public Service Media Act to provide their services for commercial benefits; having given their public services freely to the citizens. Currently PSM Owns the TVM, Dhivehi Raajeyge Adu, Dhivehi FM, Majlis Channel and Maldeeb weekly magazine.

Terrestrial programs broadcasted by PSM can be watched and terrestrial broadcasting is received only on 141 of the 201 inhabited islands. The implementation of this project will improve the population coverage of DTTB to 91.32% and allow eight terrestrial television channels to be watched on 172 of the 201 inhabited islands.

8.2. Project Duration
The total project is design to complete in 2 years. Once the EIA Decision Statement has been obtained the project would commence and expected to complete during middle of 2018. According to the proposed schedule, for each island it required six and half months to the construction of transmitting station. Therefore the total of 22 transmission station would be constructed within 13 months. Even though, for each island it takes one and half months to complete construction of the antenna, the 22 antenna constructed during 4 months period. This is achieved by constructing half of the antenna and their transmitting station simultaneously. After the completion of the construction of the Antenna, it would take duration of roughly 2 months to complete the erection of single antenna. The proponent is planning to erect 5 antennas simultaneously so that a total duration of nine and half months, the erecting of all 22 antennas would be accomplished.

The time schedule of the Project and the Dhidhdhoo site is shown in Table 8.1. The schedule of Dhidhdhoo site is as follows.
Construction period: July 2017-November 2017
Foundation excavation: 10 days
Foundation concrete placement: 40 days
Construction of tower and building: 60 days
Installation of equipment and test: 40 days

Table 8.1: Time Schedule of the Project for Dhidhdhoo Site

<table>
<thead>
<tr>
<th>Year</th>
<th>Item \ Month</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>7</td>
<td>8</td>
<td>9</td>
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<tr>
<td></td>
<td>Approval of Cabinet, E/N and G/A</td>
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<td>Detailed Design/Tender Preparation</td>
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<tr>
<td></td>
<td>Tender Procedure</td>
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<tr>
<td></td>
<td>Construction of GTT Tower/Station</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Construction in Dhidhdhoo Site</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Handover (22 sites)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The time schedule of the Project and the Kulhudhuffushi site is shown in Table 8.2. The schedule of Kulhudhuffushi site is as follows.

Construction period: April 2017-November 2017
Foundation excavation: 10 days,
Foundation concrete placement: 40 days,
Construction of tower and building: 60 days,
Installation of equipment and test: 40 days

Table 8.2: Time Schedule of the Project for Kulhudhuffushi Site

<table>
<thead>
<tr>
<th>Year</th>
<th>Item \ Month</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Approval of Cabinet, E/N and G/A</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Detailed Design/Tender Preparation</td>
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<tr>
<td></td>
<td>Tender Procedure</td>
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<tr>
<td></td>
<td>Construction of GTT Tower/Station</td>
<td></td>
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<tr>
<td></td>
<td>Construction in Kulhudhuffushi Site</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Handover (22 sites)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The time schedule of the Project and the Funadhoo site is shown in Table 8.3. The schedule of Funadhoo site is as follows. Construction period: February 2018-June 2018

Foundation excavation: 10 days,
Foundation concrete placement: 40 days
Construction of tower and building: 60 days,
Installation of equipment and test: 40 days

Table 8.3: Time Schedule of the Project for Funadhoo Site

<table>
<thead>
<tr>
<th>Item</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Approval of cabinet, E/N and G/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detailed design/Tender preparation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tender procedure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction of GTTB tower/station</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction in Funadhoo site</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand over (21 sites)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Construction period: October 2017-February 2018
Foundation excavation: 10 days,
Foundation concrete placement: 40 days,
Construction of tower and building: 60 days,
Installation of equipment and test: 40 days

Table 8.4: Time Schedule of the Project for Manadhoo Site

<table>
<thead>
<tr>
<th>Item</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Approval of cabinet, E/N and G/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detailed design/Tender preparation</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Tender procedure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction of GTTB tower/station</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction in Manadhoo site</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand over (21 sites)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Construction period: April 2017-November 2017
Foundation excavation: 10 days,
Foundation concrete placement: 40 days,
Construction of tower and building: 60 days,
Installation of equipment and test: 40 days

Table 8.5: Time Schedule of the Project for Dhangethi Site

<table>
<thead>
<tr>
<th>Item</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Approval of cabinet, E/N and G/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detailed design/Tender preparation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tender procedure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction of GTTB tower/station</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction in Manadhoo site</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand over (21 sites)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Construction period: April 2017-November 2017
Foundation excavation: 10 days,
Foundation concrete placement: 40 days,
Construction of tower and building: 60 days,
Installation of equipment and test: 40 days
Table 8.5: Time Schedule of the Project for Dhangethi Site

<table>
<thead>
<tr>
<th>Year \ Month</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approval of cabinet, E/N and G/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detailed design/Tender preparation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tender procedure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction of GTTB tower/station</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction in Dhangethi site</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand over (21 sites)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The time schedule of the Project and the Felidhoo site is shown in Table 8.6. The schedule of Felidhoo is as follows.

Construction period: November 2017-April 2018
Foundation excavation: 10 days,
Foundation concrete placement: 40 days,
Construction of tower and building: 90 days,
Installation of equipment and test: 40 days

Table 8.6: Time Schedule of the Project for Felidhoo Site

<table>
<thead>
<tr>
<th>Year \ Month</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approval of cabinet, E/N and G/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detailed design/Tender preparation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tender procedure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction of GTTB tower/station</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction in Felidhoo site</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand over (21 sites)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The time schedule of the Project and the Guraidhoo site is shown in Table 8.7. The schedule of Guraidhoo site is as follows.

Construction period: March. 2017-August 2017
Foundation excavation: 10 days,
Foundation concrete placement: 40 days,
Construction of tower and building: 60 days,
Installation of equipment and test: 40 days
Table 8.7: Time Schedule of the Project for Guraidhoo Site

<table>
<thead>
<tr>
<th>Item \ Year</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7 8 9 10 11 12</td>
<td>1 2 3 4 5 6 7 8 9 10 11 12</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>Approval of cabinet, E/N and G/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detailed design/Tender preparation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tender procedure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction of GTTB tower/station</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction in Guraidhoo site</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand over</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The time schedule of the Project and the Gan site is shown in Table 8.8. The schedule of Gan site is as follows.

Construction period: April 2017-November 2017
Foundation excavation: 20days,
Foundation concrete placement: 40days,
Construction of tower and building: 60days,
Installation of equipment and test: 40 days

Table 8.8: Time Schedule of the Project for Gan Site

<table>
<thead>
<tr>
<th>Item \ Year</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7 8 9 10 11 12</td>
<td>1 2 3 4 5 6 7 8 9 10 11 12</td>
<td>1 2 3 4 5 6 7</td>
</tr>
<tr>
<td>Approval of cabinet, E/N and G/A</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Detailed design/Tender preparation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tender procedure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction of GTTB tower/station</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction in Gan site</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand over</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The time schedule of the Project and the Fiyoari site is shown in Table 8.9. The schedule of Fiyoari site is as follows.

Construction period: July 2017-November 2017
Foundation excavation: 10days,
Foundation concrete placement: 30days,
Construction of tower and building: 40days,
Installation of equipment and test: 40 days
8.3. Project Background

8.3.1. Aim and Objectives of the Project

The republic of Maldives is divided into approximately 1190 small coral islands in which only about 201 islands are populated. The total population of 350,000 were distributed throughout the 201 islands in 26 geographic atolls, among which nearly 40 percent inhabit in the country capital, Male’. The remaining 60 percent of the population is scattered in 200 islands over a length of roughly about 900km. However, a significant disparity could be seen on infrastructure development between the metropolitan area and Atolls. Due to this significant disparity the inhabitants in the remote islands has difficulties in access to information.

In order to reduce these differences, infrastructure improvement has taken as a priority issue in National Development Plan the Government of Maldives. The telecommunication network, in particular, has complete coverage throughout the country and television broadcasting could reach all most all the inhabitant in atolls.

Most of the public depends on television and radio broadcast by Public Service Media for essential information in their life such as news, entertainment, education, religion, and weather information. Hence the Government has layout its plans and has set the targets to give coverage of television and radio broadcasting to entire population.

The project purpose shall be to ‘improve people’s access to information and to correct the regional disparity in the access to information’. Furthermore, the overall goal shall be consequently to ‘provide diverse broadcasting services throughout the Maldives and transmit high-quality information on its national culture and uniqueness’ so that each atoll can transmit programs on indigenous culture and uniqueness of the regions and that an affluent society that can accept diverse culture is created.

Table 8.9: Time Schedule of the Project for Fiyoari Site

<table>
<thead>
<tr>
<th>Item</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approval of cabinet, E/N and G/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detailed design/Tender preparation</td>
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<tr>
<td>Tender procedure</td>
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<td></td>
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</tr>
<tr>
<td>Construction of GTTB tower/station</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Construction in Fiyoari site</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand over (21 sites)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


The objectives of the Project is to establish the Digital Terrestrial Television Broadcasting (DTTB) Network and migrate to digital broadcasting in Maldives adopting Japanese digital terrestrial television standards ISDB-T based on request of Communication Authority of Maldives (CAM)/Ministry of Home Affairs (MHA) to Japanese Government.

The network aims improving the access to the information, narrowing the information gap among islands, enhancing the capacity for disaster prevention by providing a wide variety of information to the population. In particular, the network aims:

1) To get broadcasters to share a common transmission network, and
2) To have a system for early warnings and emergency communication for the better mitigation of disasters.

8.3.2. Project locations

Under this project, a total of 22 masts would be upright in 22 sites allocated different islands, in order to establish the Digital Terrestrial Television Broadcasting (DTTB) Network. Among this 22 sites only 9 sites were selected by Environmental Protection Agency to complete the Environmental Impact Assessment process, after screening the 22 sites with the assistance from JICA study team and PSM

*Table 8.10: Details of the towers for the selected 9 islands*

<table>
<thead>
<tr>
<th>No.</th>
<th>Atoll</th>
<th>Island</th>
<th>Existing Tower Height (m)</th>
<th>Proposed Tower Height (m)</th>
<th>Proposed New/Existing Site</th>
<th>Proposed Transmitting/Relay Station</th>
<th>Combination Type of Tower &amp; Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HA</td>
<td>Dhidhdho</td>
<td>40</td>
<td>60</td>
<td>Existing</td>
<td>Transmit.</td>
<td>A</td>
</tr>
<tr>
<td>2</td>
<td>HDh</td>
<td>Kulhudhuffushi</td>
<td>40</td>
<td>50</td>
<td>New</td>
<td>Transmit.</td>
<td>A</td>
</tr>
<tr>
<td>3</td>
<td>Sh</td>
<td>Funadhoo</td>
<td>40</td>
<td>70</td>
<td>New</td>
<td>Transmit.</td>
<td>A</td>
</tr>
<tr>
<td>4</td>
<td>N</td>
<td>Manadhoo</td>
<td>40</td>
<td>70</td>
<td>Existing</td>
<td>Transmit.</td>
<td>A</td>
</tr>
<tr>
<td>5</td>
<td>V</td>
<td>Felidhoo</td>
<td>40</td>
<td>80</td>
<td>Existing</td>
<td>Transmit.</td>
<td>B</td>
</tr>
<tr>
<td>6</td>
<td>ADh</td>
<td>Dhangethi</td>
<td>-</td>
<td>70</td>
<td>New</td>
<td>Transmit.</td>
<td>A</td>
</tr>
<tr>
<td>7</td>
<td>L</td>
<td>Gan</td>
<td>-</td>
<td>80</td>
<td>New</td>
<td>Transmit.</td>
<td>A</td>
</tr>
</tbody>
</table>
### 8.3.3. H.A. Dhidhdhoo

People are engaged in construction, fishing, and government jobs. Retail shops also provide job opportunities. Island has most of the infrastructures including health, education, power, water and sewerage. In addition to this, the island also has harbor, police, Gender office and Bank. Road construction work is ongoing on the island. The total population of the island is 2618, consisting of 1109 Male and 1509 Female. Age groups for the island are readily not available.

![Figure 8.1: HA. Dhidhdhoo](image)

In Dhidhdhoo, there is an existing 40 meter high tower transmitting the broadcasting signal. However this 40 meter high tower would be replaced by a tower with height 60 meters and existing site would be used for this component of the project.
8.3.4. H.Dh. Kulhudhuffushi

People are engaged in construction, tourism, fishing, and government jobs. Many people are also working in retail businesses. Island has most of the infrastructures including health, education, power, water and sewerage. In addition to this, the island also has harbor, police, MNDF, Fire service, STO, Port, customs, Dhiraagu, Ooredoo and STO. The total population of the island is 8191, consisting of 3766 Male and 4425 Female. Age groups for the island are readily not available.

In Kulhudhuffushi, there is an existing 40 meter high tower transmitting the broadcasting signal. However, a tower with height 50 meters would be erected in a new location in this component of the project.

![Diagram of H.Dh. Kulhudhuffushi](image)

*Figure 8.2: H.Dh. Kulhudhuffushi*
Figure 8.3: HA. Kulhudhuffushi Site
8.3.5. Sh. Funadhoo

People are engaged in fishing, agriculture, tourism, construction and government jobs. Retail shops and café restaurants also provide job opportunities. Infrastructures at the island include power house, sewage system, hospital, schools, and youth center and, family and children service center and guest houses. Other infrastructures include Atoll council, island council, magistrate court and atoll police station. The total population and age groups for the island depicted below.

In Funadhoo, there is an existing 40 meter high tower transmitting the broadcasting signal. However a tower with height 70 meters would be erected in a new location in this component of the project.

<table>
<thead>
<tr>
<th>Table 8.11:: Population Censuses of Sh. Funadhoo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
8.3.6. N. Manadhoo

People are engaged in government, agriculture, boat building jobs. Some are also working in the construction and fishing area. Retail shops and café restaurants also provide job opportunities. Infrastructures at the island include water supply, power house, sewerage system, hospital, office buildings and harbor, TV, Internet and communication towers.

The total population of the island is 1915, consisting of 1010 Male and 4905 Female. Age groups for the island are readily not available.

In Manadhoo, there is an existing 40 meter high tower transmitting the broadcasting signal. However a tower with height 70 meters would be erected in a new location in this component of the project.

8.3.7. ADh. Dhangethi

People are engaged in tourism and government jobs. Some are also working in the construction and fishing area. Retail shops and café restaurants also provide job opportunities. Infrastructures at the island include office buildings and guest houses and jetty. The total population of the island is 709, consisting of 349 Male and 360 Female. Age groups for the island are readily not available.
Figure 8.10: The Proposed site of ADh. Dhangeth

Figure 8.11: The dimension of the proposed site of ADh. Dhangeth
8.3.8. V. Felidhoo

People are engaged in tourism, construction, fishing, agriculture (limited) and government jobs. Retail shops and café restaurants also provide job opportunities. Infrastructures at the island include office buildings and guest houses, harbor, towers, police station, bank, sewerage, hospital, school, power and jetty. The total population of the island is 473, consisting of 249 Male and 224 Female. Age groups for the island are readily not available.

![The Proposed site of V. Felidhoo](image1)

*Figure 8.12: The Proposed site of V. Felidhoo*

![The dimension of the proposed site of V. Felidhoo](image2)

*Figure 8.13: The dimension of the proposed site of V. Felidhoo*
8.3.9. Th. Guraidhoo

People are engaged in construction, fishing, tourism and government jobs. Only few locals are working in the area of agriculture. Retail shops and café restaurants also provide job opportunities. Infrastructures at the island include health, power and sewerage service and education and office buildings. The total population and Male and Female age groups for the island depicted below.

Table 8.12: Population Censuses of Th. Guraidhoo

<table>
<thead>
<tr>
<th>Gender</th>
<th>Under 18</th>
<th>18 - 35</th>
<th>35 - 65</th>
<th>Above 65</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>242</td>
<td>396</td>
<td>310</td>
<td>45</td>
<td>993</td>
</tr>
<tr>
<td>Female</td>
<td>287</td>
<td>371</td>
<td>326</td>
<td>68</td>
<td>1052</td>
</tr>
<tr>
<td>Total</td>
<td>529</td>
<td>767</td>
<td>636</td>
<td>113</td>
<td>2045</td>
</tr>
</tbody>
</table>

Figure 8.14: The Proposed site of Th. Guraidhoo

Figure 8.15: The dimension of the proposed site of Th Guraidhoo
8.3.10. L. Gan

People are engaged in fishing, agriculture, tourism, construction and government jobs. Retail shops and café restaurants also provide job opportunities. Infrastructures at the island include powerhouse, sewage system, link road, hospital, schools, bank, guest houses and harbor. The total population and gender age groups for the island depicted below.

Table 8.13: Population Censuses of L. Gan

<table>
<thead>
<tr>
<th>Gender</th>
<th>Under 18</th>
<th>18 - 35</th>
<th>35 - 65</th>
<th>Above 65</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>731</td>
<td>973</td>
<td>590</td>
<td>130</td>
<td>2425</td>
</tr>
<tr>
<td>Female</td>
<td>724</td>
<td>842</td>
<td>584</td>
<td>90</td>
<td>2243</td>
</tr>
<tr>
<td>Total</td>
<td>1455</td>
<td>1815</td>
<td>1174</td>
<td>220</td>
<td>4668</td>
</tr>
</tbody>
</table>

Figure 8.16: The Proposed site of L. Gan

Figure 8.17: The dimension of the proposed site of L. Gan
8.3.11. **GDh. Fiyori,**

People are engaged in construction, fishing, agriculture, tourism and government jobs. Retail shops and café restaurants also provide job opportunities. Infrastructures at the island include health and power service and education. Banking services (agent), Dhiraagu, Ice plant and harbor are some of the other infrastructures at the island. The total population and Male and Female age groups for the island depicted below.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Under 18</th>
<th>18 - 35</th>
<th>35 - 65</th>
<th>Above 65</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>258</td>
<td>287</td>
<td>180</td>
<td>44</td>
<td>769</td>
</tr>
<tr>
<td>Female</td>
<td>209</td>
<td>289</td>
<td>190</td>
<td>43</td>
<td>731</td>
</tr>
<tr>
<td>Total</td>
<td>465</td>
<td>576</td>
<td>370</td>
<td>87</td>
<td>1500</td>
</tr>
</tbody>
</table>

*Table 8.14: Population Censuses of GDh. Fiyori*

![Proposed New Site of Fiyori](image)

*Figure 8.18: The Proposed site of GDh. Fiyori*
8.4. Project Activities

8.4.1. Construction of Foundation

There are two types of foundation proposed to each tower, the foundation proposed for main tower and the foundation laid to support the leader, which would be used for accessing to the tower for its maintenance. The foundation for the four legs of the tower is placed over a lean concrete at an average depth of 3.9 meters. However the foundation of the leader is at a depth 0.2 meter from the ground and which is supported by lean concrete with two vertical pile.

Figure 8.20: Foundation of the tower
8.4.2. Station Building

In each site a two story building will be constructed to host receiving and transmitting equipment. All the station are fully automated. The total height of the building is 6.8meters from ground. The horizontal dimension of the building is set to be 5meter by 5.2meter.

In the station will have the following equipments:

8.4.3. Transmitting Site

- Digital Transmitter system
- UHF Receiver
- Exciter
- Power Amplifier
- Combiner
- Antenna System
- UPS

Figure 8.21: Cross-sectional view of Foundation
8.4.4. **Micro Relay Station**

- Microwave link system
- UPS
- Lightening-poor transformer
- Distribution board

*Figure 8.22: Top view of the Station*
8.4.5. Communication Tower

All the communications towers build in this project are self-supporting towers. The towers will be up righted on four legs which will be supported by a concrete foundation. The height of the towers varies from 50meters to up to 90meters. In all these towers, the narrowest part is 2meter by 2meter square, which is at the top of the tower with height 7.5 meters. In each tower a leader is constructed from the center of it. This leader would be the maintenance leader.
### Figure 8.24: Combination type tower and station

<table>
<thead>
<tr>
<th>Combination Type of Tower and Station</th>
<th>Site</th>
</tr>
</thead>
</table>
| ![Combination Type of Tower and Station](image) | A
| ![Combination Type of Tower and Station](image) | B
| ![Combination Type of Tower and Station](image) | C
| 1 Dhidhdhoo  
2 Kulhudhufushi  
3 Funadhoo  
4 Manadhoo  
6 Eydhafushi  
7 Naifaru  
8 Vilingili (Male)  
10 Felidhoo  
11 Dhangethi  
13 Nilandhoo  
14 Gan  
15 Guraadhi  
16 Viligili  
17 Gedhhdhoo  
19 Thinadhoo  
20 Foammulah  
21 Hithadhoo | 6 Ungoofaaho
| 11 Maafushi  
12 Feeali  
18 Fiyoari |  |
8.4.7. Project inputs

Various resources been used in this project are given in the tables below, including from where and how these will be obtained.

**Table 8.15: Matrix of major inputs during construction stage**

<table>
<thead>
<tr>
<th>Input</th>
<th>Source/Type</th>
<th>Contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workers (20 to 50)</td>
<td>Local and Foreign</td>
<td>Contractor</td>
</tr>
<tr>
<td>Electricity/Energy</td>
<td>Island Grid</td>
<td>Existing power supply of service providers</td>
</tr>
<tr>
<td>Transport</td>
<td>Domestic plan, speed boats and dhoni. Materials to be transported in carrier vessels.</td>
<td>Contractor may have some of the vassals, if not, it can be hired from locals.</td>
</tr>
</tbody>
</table>

**Table 8.16: Machineries use on site for construction**

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Capacity</th>
<th>Quantity</th>
<th>No.</th>
<th>Name</th>
<th>Capacity</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Truck</td>
<td>10t</td>
<td>1</td>
<td>9</td>
<td>Concrete Mixer</td>
<td>0.25m3</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Dump truck</td>
<td>10t</td>
<td>1</td>
<td>10</td>
<td>Damper</td>
<td>60kg</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Bulldozer</td>
<td>10t</td>
<td>1</td>
<td>11</td>
<td>Road roller</td>
<td>6t</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Crane truck</td>
<td>4t</td>
<td>1</td>
<td>12</td>
<td>Damper</td>
<td>60kg</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Backhoe</td>
<td>0.45m3</td>
<td>1</td>
<td>13</td>
<td>Vibro-hammer</td>
<td>30kW</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Backhoe</td>
<td>0.8m3</td>
<td>1</td>
<td>14</td>
<td>Discharge pump</td>
<td>11kW</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>Truck Crane</td>
<td>25t</td>
<td>1</td>
<td>15</td>
<td>Generator</td>
<td>30kW</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>Pillar type jib crane</td>
<td>10t</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8.4.8. Project Outputs

The main project output would be a communication tower which enhances the coverage of digital television services throughout the country. Apart from this, there are several outputs of the projects that can be highlighted.
8.4.8.1. Green waste
In all most all the sights, some amount of green waste will be generated during construction phase. During the operational phase, on maintenance clearing of grass that may be grown in time within the premises also would produce green waste to some extent. in both phases the green waste will be disposed to the designated area.

8.4.8.2. Noise pollution
During construction phase, the heavy machineries used in the project site and vehicle used for transportation will produce a significant level of noise. Hence this would be localized to the project site. The heavy machineries would be mobilized during the day time so that the impact from the noise to the general public would be minimized.

8.4.8.3. Hazardous waste
During the construction, the heavy machineries used would have a tendency to produce significant amount of waste oils. Which would be barreled on site and later it will be transported to Thilafushi by contractor.

8.4.9. Methodology
In this section, the various methodologies used during collections of data on the existing environment and the social environment were discussed. The key environmental and socio-economic components of the project that were considered are physical environment and social environment. In order to study the existing environment of the island, the following data collection methodologies were used during the various field visits that undertaken for the project purposes.

Various conditions of existing environment over the proposed and existing sites were considered. The environmental study components were focused on the terrestrial environment of the project sites and its vicinity. Since the project area is confined, the vegetation survey was carryout by physical observation, and counting the number of trees existing within the site.

in order to assess the climatic condition of the given sites, long-term data from Meteorological Observatories situated Hanimaadhoo, Hulhule, Kadhdhoo and Kaadedhoo was collected from the Maldives Meteorological Service and was analyzed for the seasonal weather pattern.
As part of the Environment Impact Assessment for the project, stakeholder consultation was conduct in all the islanded. The consultation was carried out to understand how the public receives the project and analyze the potential impacts on social and economic livelihood of the island. Consultations were held through meetings.
9. **Existing Environment**

Since the location proposed in all the islands are from inland and no land reclamation is required in any of the islands, most of the existing environment that would be impacted during construction and operational phase are the existing vegetation within the plot.

9.1. **Ha. Dhidhdhoo**

9.1.1. **Protected Area**

In Ha. Dhidhdhoo, there are no any environmental sensitive area or protected area declared by Environmental Protection Agency. Similarly, the area allocated for Digital Terrestrial Television Broadcast on the land use planning by the Dhidhdhoo Island Council does not have any environmental significant area.

9.1.2. **Ecosystem**

From the observation undertook during the site visit, protected fauna and flora was not observed hence there are no confirmations of living in the site or near the site. The area around the site is residence and public offices area. There is not severing impact to ecosystem during construction as well as in operational period of Digital Terrestrial Television Broadcast.

9.1.3. **Vegetation**

The site is surrounded by wall. Trees in south side and central part of the lot were logged remaining existing facilities part and boundary part around wall. The scattering remains of logging have not removed. Still there are a total of 15 Coconut Palm on site, among those 13 trees will be removed to clear the site.

9.1.4. **Hydrology/ Topography and Geology**

Apart from mounting a 60m high mast, no topographic changes would occur by implementing the project. Similarly, hydrological or geological changes due to the project are minimal, there for such survey was not conducted during the field visit.
9.2. HDh. Kulhudhuffushi

9.2.1. Protected Area
In HDh. Kulhudhuffushi, there are no any environmental sensitive areas or protected area declared by Environmental Protection Agency. Similarly, the area allocated for Digital Terrestrial Television Broadcast on the land use planning by the Kulhudhuffushi Island Council does not have any environmental significant area. (ESA) is indicated in north part of the island on the ESA map of EPA. Mangroves and wetlands are described. However the site is located around 1.8km from the wetlands which is designated as environmental sensitive area by Environmental Protection Agency. Hence, location proposed for Digital Terrestrial Television Broadcast Service on the land use plan which is maintained by the Kulhudhuffushi Island Council, is not located within the environmental protection zone (EPZ) or the sensitive area of Kulhudhuffushi.
9.2.2. Ecosystem

From the observation undertook during the site visit, protected fauna and flora was not observed hence there are no confirmations of living in the site or near the site. However, the site is surrounded by planting high trees (mainly coconut trees) area. There is possibility of affecting an impact to trees of the coastal green area due to groundwater drawdown by dewatering and emission of equipment and machines during construction period, but this impact would be negligible,
especially during the operational phase of Digital Terrestrial Television Broadcast.

9.2.3. Vegetation
The site is high trees (mainly coconut trees) planting and grasses glowing area. The tree cuttings and treatments of the roots of high trees are required. According to the survey carried out for this EIA there are 18 coconut palms needed to be removed from the project site.

9.3. Sh. Funadhoo

9.3.1. Protected Area
The island is sharing a common lagoon with Sh. Farukolhu, which is an Environmental Sensitive Area declared by Environmental Protection Agency. However within the island Funadhoo there are no protected or sensitive area declared. The project site is about 180 m from the lagoon. Therefore the site is not in the environmental protection zone (EPZ) on the land use planning of Funadhoo Island Council. There is no direct impact to those protected area.

9.3.2. Ecosystem
From the observation mad on survey trip for this EIA, protected fauna and flora is not confirmed to live in the site or vicinity of the site. However, Environmental Sensitive Area is set situated within the lagoon which is about 180m from the site. The proposal site is surrounded rather wide vegetated area and incinerator plant to the southern side of the site. There is possibility of impact to trees of the coastal green area due to groundwater drawdown by dewatering and emission of equipment and machines during construction period. To reduce the impact on the green area, the steal piling work shuts the excavated area by discounting groundwater flow during dewatering work. The direct blowing of emission towards trees should be avoided.

9.2.4. Hydrology/ Topography and Geology
Apart from mounting a 50m high mast, no topographic changes would occur by implementing the project. Similarly, hydrological or geological changes due to the project are minimal, there for such survey was not conducted during the field visit.
9.3.3. Vegetation

Many of high trees including coconut palms, middle height trees and shrubs are rather densely growing in the proposed new site. For the construction work of the new tower and the new station, the tree cuttings and removal of the roots of high trees are required.

From the survey conducted for this EIA, it has been found that 17 trees needed to be uprooted or cut from the proposed site.

Table 9.1: Trees on the proposed site at Sh. Funadhoo

<table>
<thead>
<tr>
<th>Local Name</th>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ruh</td>
<td>Coconut Palm</td>
<td>Cocus Nucifera</td>
<td>39</td>
</tr>
<tr>
<td>Midhili</td>
<td>Tropical - Almonds</td>
<td>Terminalia catappa</td>
<td>1</td>
</tr>
<tr>
<td>Hirundhu</td>
<td>Portia Tree</td>
<td></td>
<td>14</td>
</tr>
</tbody>
</table>

9.4. N. Manadhoo

9.4.1. Protected Area

In N. Manadhoo, there is no any environmental sensitive area or protected area declared by Environmental Protection Agency. Similarly, the area allocated for Digital Terrestrial Television Broadcast on the land use planning by the Manadhoo Island Council does not have any environmental significant area.

9.4.2. Ecosystem

The protected fauna and flora is not confirmed to live in the site or near the site. However, a coastal green area is adjacent to the east and north side of the site. There is possibility of impact to trees existing in the
coastal green area due to groundwater drawdown by dewatering and emission of equipment and machines during construction period. To reduce the affection to costal green area, the steal piling work shut excavation area is used to discontinue horizontal groundwater flow during dewatering work. The direct blowing of emission to direction of trees would be avoided. There is no impact to ecosystem in DTTB service period.

9.4.3. Vegetation
Many of high trees including coconut trees, middle height trees and shrubs are rather densely growing in the proposed expansion area of the site. For the construction work of the new tower and the new station, the tree cuttings and treatments of the roots of high trees are required.

Table 9.2: Trees on the proposed site at N. Manadhoo

<table>
<thead>
<tr>
<th>Local Name</th>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ruh</td>
<td>Coconut Palm</td>
<td>Coccus Nucifera</td>
<td>8</td>
</tr>
<tr>
<td>Midhili</td>
<td>Tropical Almonds</td>
<td>Terminalia catappa</td>
<td>7</td>
</tr>
<tr>
<td>Ban’bukeyo</td>
<td>Breadfruit</td>
<td>Artocarpus altilis</td>
<td>2</td>
</tr>
<tr>
<td>Hirundhu</td>
<td>Portia Tree</td>
<td></td>
<td>6</td>
</tr>
</tbody>
</table>

9.5. A.Dh. Dhangethi
9.5.1. Protected Area
In ADh. Dhangethi, there is no any environmental sensitive area or protected area declared by Environmental Protection Agency. Similarly, the area allocated for Digital Terrestrial Television Broadcast on the land use planning by the Dhangethi Island Council does not have any environmental significant area.

9.5.2. Ecosystem
From the observation mad on survey trip for this EIA, protected fauna and flora is not confirmed to live in the site or vicinity of the site. There are two protected Banyan trees (Nika Gas), which are registered and growing in 2 dwelling lots respectively 350m apart and more from the project site. It is not prospected impact to the 2 old trees. But, the coastal vegetation exists near the site across the existing road. Hence, there are possibilities of impacting the vegetation across the road due to groundwater drawdown by dewatering and emission of equipment and machines during construction period. To reduce the affection to costal green area, the steal piling is used to shut excavation area to discontinue horizontal groundwater flow during dewatering work. The direct blowing of emission towards the direction of trees would be avoided.
9.6. V. Felidhooo,  

9.6.1. Protected Area  
In V. Felidhooo, there is no any environmental sensitive area or protected area declared by Environmental Protection Agency. Similarly, the area allocated for Digital Terrestrial Television Broadcast on the land use planning by the Felidhoo Island Council does not have any environmental significant area.

9.6.2. Ecosystem  
At a distance of 70m from the project site three Banyan trees within are protected is located in the island and also apart from the protected trees, coastal vegetation present at close proximity to the project site. However this vegetation is located across the road coastal green area across the road. There is possibility of impacting to trees of the coastal vegetation due to groundwater drawdown by dewatering and emission of equipment and machines during construction period. To reduce the affect of dewatering, the steel piling would be used to shut excavation area to reduce horizontal groundwater flow during dewatering work. The direct blowing of emission towards direction of trees would be avoided. There is no impact to ecosystem in DTTB service period.

9.5.3. Vegetation  
The site is in part of vegetated area. Inside the roads, trees of medium high such as coconuts tree and shrubs are thickly growing and form bush which is difficult to enter. Tree cutting is required for construction work.

Table 9.3: Trees on the proposed site at A.Dh. Dhangethi

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ruh</td>
<td>Coconut palm</td>
<td>Cocos Nucifera</td>
<td>29</td>
</tr>
<tr>
<td>2</td>
<td>Midhil</td>
<td>Country Almond</td>
<td>Terminalia procera</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Dhigga</td>
<td>Sea Hibiscus</td>
<td>Hibiscus tiliaceus</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Dhakan’dhaa</td>
<td></td>
<td>Premna serratifolia</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Boakeyo</td>
<td>Pandanus</td>
<td>Pandanus tectorius Parkinson</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>Uni</td>
<td>Nit Picha</td>
<td>Guettarda speciosa</td>
<td>2</td>
</tr>
</tbody>
</table>
9.6.3. Vegetation

Table 9.4: Trees on the proposed site at V. Felidhoo

<table>
<thead>
<tr>
<th>Name</th>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ruh</td>
<td>Coconut palm</td>
<td>Cocus Nucifera</td>
<td>25</td>
</tr>
<tr>
<td>Uni</td>
<td>Alexander Laurel wood</td>
<td>Guettarda Speciosa</td>
<td>1</td>
</tr>
<tr>
<td>Dhigga</td>
<td>Sea Hibiscus</td>
<td>Hibiscus tiliaceus</td>
<td>4</td>
</tr>
<tr>
<td>Midhili</td>
<td>Country Almond</td>
<td>Terminalia procera</td>
<td>5</td>
</tr>
<tr>
<td>Kaani</td>
<td>Sea Trumpet</td>
<td>Cordia subcordata</td>
<td>2</td>
</tr>
<tr>
<td>Ipil-ipil</td>
<td>Leucaena</td>
<td>Leucaena leucocephala</td>
<td>2</td>
</tr>
</tbody>
</table>

On the land use plan of prepared by Felidhoo Island Council, the site is drawn up as a telecom planed lot paralleled police station. Along outer circumference of the lot, the trees with medium height and short trees are growing, and in inside of the lot, grasses and sparse shrub are present. The tree cutting is required for the construction.
9.7. **Th. Guraidhoo**

9.7.1. Protected Area
In Th. Guraidhoo, there is no any environmental sensitive area or protected area declared by Environmental Protection Agency. Similarly, the area allocated for Digital Terrestrial Television Broadcast on the land use planning by the Guraidhoo Island Council does not have any environmental significant area.

9.7.2. Ecosystem
The existing and the proposed site for the project is within a residential area, hence protected fauna and flora is not confirmed to live in the site or near the site. The possibility to affect existing ecosystem is minimal. There would be no impact to ecosystem in DTTB service period.

9.7.3. Vegetation
The only vegetation in the site is 27 coconut palms growing within the PSM site. The
surface is covered with medium sand gravels. These 27 palms would be uprooted for the construction of the facility.

9.8. L. Gan

9.8.1. Protected Area
The protected Area and the Environmental sensitive area (ESA) are not instituted by EPA in Gan. In the land used plan prepared by the Gan Island Council an environmental protection zone along coast on the island is marked. The propose site is about 500m from this marked zone. Therefore there will not be any significant impact from the project activities of this project.

9.8.2. Ecosystem
Although the protected fauna and flora is not confirmed to live in the site or near the site, the site is situated inside the thick vegetation exist in the island. Therefore, there is possibility of impact to the vegetation through groundwater drawdown by dewatering and emission of equipment and machines during construction period. To reduce these effects the steal piling would be used to isolate excavation area to reduce the horizontal flow of groundwater during dewatering. The emission would not be directly blown to the vegetation. There is no impact to ecosystem in DTTB service period.
9.8.3. Vegetation
The site is within the thick vegetated area. The site also surrounded by thick vegetation from three sides and 10 to 15 m wide and clear road is situated on the fourth side of the site. Around 15 high coconut trees are growing. In backside of the zone, there is narrow abandoned cultivated land, and 50 cm height grasses are growing. Uprooting of trees is necessary for the construction.

9.9. Gdh. Fiyori,

9.9.1. Protected Area
It was determined that there are environmental protected areas present in the island. However at a distance of about 1 km from the proposed project site a wetland is presented in the southern side of the island, which may be regarded as environmental sensitive area. Since this area is situated far from the project site, the impact from various activities of this project will be negligible.

9.9.2. Ecosystem
The protected fauna and flora is not confirmed to live in the site or near the site. However, coastal green zone is adjacent to the site. There is possibility of impact to trees of the coastal green area due to groundwater drawdown by dewatering and emission of equipment and machines during construction period. To reduce the effect to the coastal area, the steel piling would be used to enclose excavation area. This would reduce the horizontal flow of groundwater during dewatering. The direct blowing of emission to trees direction is avoided. There is no impact to ecosystem in DTTB service period.

Figure 9.28: Existing condition as L. Gan Site

Figure 9.29: Existing condition as G.Dh.. Fiyori Site
9.9.3. Vegetation

The site is covered densely high trees, medium trees and tall grasses of about 5feet.

The plot is mostly covered in shrubs (ie: Scaevola Taccada commonly known as sea lettuce tree) as the plot is closer to the coastal area. The major trees identified are as listed below

Table 9.5: Trees on the proposed site at G.Dh. Fiyori

<table>
<thead>
<tr>
<th>Name</th>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ruh</td>
<td>Coconut palm</td>
<td>Cocos nucifera</td>
<td>27</td>
</tr>
<tr>
<td>Uni</td>
<td>Alexander Laurel wood</td>
<td>Guettarda</td>
<td>Speciosa</td>
</tr>
<tr>
<td>Fakoydhi niha</td>
<td>Weeping fig</td>
<td>Ficus Benjaminia</td>
<td>1</td>
</tr>
</tbody>
</table>

It is necessary to uproot 35 trees tree and removal of the grass for the project activities.

10. Climate

Since Maldives is situated across the equator along longitudes from around latitude of 7 degree north to around 0.5 degree South, with more than 1000 island, only handful of islands are equipped with weather observatories. Therefore for the Northern islands the weather data were gathered from the stations located at H.Dh. Hanimaadho, for central atolls, the data were collected from Hulhule and for the southern atolls the observatories in L. Kadhoo and Kaadedhoo were used. All these observatories are among the weather monitoring network of Maldives Meteorological Services run under Ministry of Environment and Energy.

10.1. Monsoon

According to historical and scientific data collected by Maldives Meteorological Service, there are mainly two monsoons affecting the weather pattern of the country throughout the year. The shortest among these monsoons is the Northeast monsoon, which is locally known as "Eruvai Moosun" which means monsoon with easterly winds. This monsoon fairly set over the country from December till end of March. The monsoon is associated with mostly calm wind from Northeast to Southeast sector. It also associated with intense heat, which peaks around March and dry weather as well. During this season isolated dry thunder occurred due to the formation of thunder clouds by sudden uplifting the dry air coming from Indian sub-continent by the more dense moist air present over the region. When these dry airs is uplifted suddenly, it undergoes
rapid cooling and form towering cumulus which in time gives thunder. Even though thunderstorms often associated with heavy rain, due to the dryness of the air and intense heat of the season, the rain which occur during the thunder activity re-evaporate before it reaches to the ground by the friction the air column, hence occasional dry thunder occur. During this season, seas are generally calm.

During these monsoons, the air temperature hardly varies. The average maximum observed temperature is around 32°C and the average minimum temperature occurs around 25°C. But in northern part of the country, it has been observed the minimum temperature goes as low as 20°C. The average humidity during this season was observed to be 65 present, which is responsible for the experience in extensive heat in this season.

The major part of the year is associated with Southwest monsoon, which is locally known as "Hulhangu Moosun". The term "Hulhangu Moosun" means monsoon with westerly winds. During this monsoon, the cold, moist air from the southern Indian Ocean blows over the country from Southwest to Northwest direction. This is the season associated with frequent heavy rainfall and scarily winds. During this monsoon the average gust may be between 25 to 60 knots, hence with the storm it may reach more than 100 knots as well. The rainfall of this season contributes more than 90 percent of the annual rain fall, which is about 2000 millimeters. This monsoon last from May till end of October. During this period significantly high wave condition could be observed throughout the season. Inundations of waves are frequently expected inland with stormy condition.

April is associated to the transition period from Northeast Monsoon to Southwest Monsoon. During this period, the wind starts to pick its speed and isolated showers were experience with calm to moderate sea condition. November is related to the transition period from Southwest Monsoon to Northeast Monsoon. During this period isolated heavy to moderate showers are frequent and moderate sea conditions were observed throughout the country.

During both monsoons, the air temperature hardly varies. The average maximum observed temperature is around 32°C and the average minimum temperature occurs around 25°C. During this season, the average humidity of air remains around 80 percent. This humid condition is responsible for cooling effect experience in this season.
11. Alternatives

11.1. No Project Alternative
The "No Project Alternative" implies not to proceed with the construction of communication towers and the service centers for Digital Terrestrial Television Broadcast system. This option would likely leads to inaccessibility to the broadcasting media by at least 10 to 20 percent of the general population. This would demise the constitutional rights of giving access to information by the Constitute of the Maldives. This also diminish the chance of been updated, informative aware to the events happening concerning the general public. Since the community of the Maldives is scattered over 200 islands, in the event of a disaster, the Digital Terrestrial Television Broadcast system would play an important role to aware the general public. It also would disseminate the necessary warnings and massages in times of such disaster. Therefore without this network of antenna, dissemination of such information to entire public would not be possible.

11.2. Guyed Towers
A guy tower is a cable stabilized tower with a central mast surrounded by one or more levels of guy wires. The guys typically extend in three directions from the mast and extend to the ground where the guys are anchored. Guyed towers require separate foundations for the mast and each guy anchor. Due to the weight of the mast structure, the weight of the guy wires and the fact that guys are tensioned during installation, the mast creates a large downward load on its foundation. Additionally, the mast foundation must also be designed to resist horizontal loading caused by wind. The guy anchor foundations are subject to uplift and horizontal loading directed along the guy wire path.

11.3. Monopole Towers
Monopole tower are simple, single mast, hollow steel pipe towers. A monopole utilizes a single foundation at its base that takes the vertical, horizontal and most importantly, the overturning load of the tower.

11.4. Self-Supporting Towers
A self-supporting tower is a free-standing tower with three or four legs connected by a latticework of braces. Self-supporting towers can either utilize a single foundation supporting all of the tower legs or individual foundations below each leg. Due to wind loading, lattice tower foundations can experience both vertical loads and horizontal loads. The vertical loads act in both, the upwards and
downwards directions, as the tower attempts to overturn. The horizontal or shear loading can act in any direction as the direction of the wind can vary.

Figure 11.1: Monopole Tower

Figure 11.2: Self-Supporting Tower

Figure 11.3: Guyed Tower

11.5. Spread Footer (Mat) Foundations
A spread footer foundation is the most common type of foundation used for self-supporting towers and the mast foundations for guyed towers. A spread footer is simply a large reinforced concrete slab that resists the forces placed on it by mass alone.

Figure 11.4: Spread Footer (Mat) Foundations
11.6. Drilled Shaft (Caisson) Foundations
Drilled shaft foundations are a common type of foundation used for both self-supporting towers and guyed towers. Typically shafts are placed below each leg of a self-supporting tower or in the case of a guyed tower, below the mast and at each guy anchor location. Drilled shaft foundations are constructed by drilling a hole into the earth, placing reinforcing steel and anchor bolts into the hole and then filling the hole with concrete.

![Figure 11.5: Drilled Shaft (Caisson) Foundations Schematic](image)

11.7. Micro-pile & Rock/Soil Anchor Foundations
A micropile is constructed by drilling a small (6” to 12’’) hole 20’ or more into the earth, placing a single threaded rod in the hole and then filling the hole with grout. Grout is a high-strength cement material similar to concrete that utilizes a high percentage of sand rather than the larger rock aggregate used in concrete to improve its ability to flow into small places and to be pumped.
**Figure 11.6: Micro-pile & Rock/Soil Anchor Foundations**

**Table 11.1: Advantages and disadvantage**

<table>
<thead>
<tr>
<th>Advantage</th>
<th>Spread Footer</th>
<th>Drilled Shafts</th>
<th>Micro-piles/ Anchors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low cost.</td>
<td>Minimal site impact.</td>
<td>Minimal site impact.</td>
</tr>
<tr>
<td></td>
<td>Minimal equipment required to construct.</td>
<td>Requires less concrete than a spread footer.</td>
<td>Requires very little concrete and grout.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Well suited for expansive soils.</td>
<td>Concrete and grout can easily be batched on site.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Excellent for hard-rock and varying soil conditions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Excellent for remote locations with poor conditions.</td>
</tr>
<tr>
<td><strong>Disadvantage</strong></td>
<td><strong>Moderate cost.</strong></td>
<td><strong>High cost.</strong></td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------------</td>
<td>---------------</td>
<td></td>
</tr>
<tr>
<td>• Foundation is large and has a large impact.</td>
<td>• May not be efficient for hard-rock soils or soils with a mixture of soft soils and boulders.</td>
<td>• May not be efficient for soft soils.</td>
<td></td>
</tr>
<tr>
<td>• The addition of pedestals reduces the volume of concrete required but increases the depth of the excavation.</td>
<td>• Requires specialty drilling equipment and expertise.</td>
<td>• Requires specialty drilling equipment and expertise.</td>
<td></td>
</tr>
<tr>
<td>• Requires a significant volume of concrete.</td>
<td>• Generally requires a concrete pump truck.</td>
<td>• Longer construction schedule required.</td>
<td></td>
</tr>
<tr>
<td>• Concrete must be batched on site for sites with difficult access or remote locations (increases cost).</td>
<td>• May requires water for drilling in rock.</td>
<td>• Longer construction schedule required.</td>
<td></td>
</tr>
</tbody>
</table>
12. Environmental Impacts and Mitigations

12.1. Identification of Impact
The main objective of this EIA is to identify the positive and negative, and short term as well as the long term impacts that may cause due to individual activities of the proposed project. To achieve this objective various methodologies were used to collect information on the existing environment and also identify the impacts of the project. The main focus of this exercise was identification of environmental impact due to the project activities.

The proposed Project is to establish the Digital Terrestrial Television Broadcasting (DTTB) Network is expected to have impact on the terrestrial environment. These includes uprooting of trees that have been in the project sites and the dewatering that needed to be carried out during construction of foundation. This project also will have impact the livelihood of the beneficiaries and also impact the existing society in many ways.

12.2. Assessment of the Impacts
Various methodologies have been adopted and various examination were carried out through number of processes in order to assess the environmental impacts that may born by the proposed project of establish the Digital Terrestrial Television Broadcasting (DTTB) Network. These processes includes stakeholders consultation from which socio economic impact of the project was identified, field surveys from which information such as instrumental data was obtained, observation from which information such as the visible condition of the existing environment was determined. Apart from this experience gain from similar field assessments carried out for various other EIA developed for other developments was also used to assess the impacts.

The impact on the terrestrial environment was considered to be significant. Especially to the general vegetation of the islands and also in some of the islands, impacts on the costal vegetation from the project activities.

Even though these impacts considered as significant, the impact on the vegetation was categorized as short term impact. However, the effect of light indicators that would be used on all the mast are considered to be a long term impact on nesting bird community. Since in most of the islands, the height of the mast will rise above the canopy of the given island, the impact would not be very significant.
Impacts on the environment were identified and described according to their attribute, extent and characteristics and assessed in terms of their significance according to the following categories:

- **Negligible** – No significance due to small scale of impacts;
- **Minor** – impacts that may be seen but is very minor and small
- **Moderate** – some concerning impacts that likely to be tolerable in short-term
- **Major** – the impact identified with a large scale which may requires significant change or temporarily it may require halting of the project

### 12.3. Mobilization and site clearance

#### 12.3.1. Impact

Most of the vegetation would be cleared in this phase of the project. An immediate and most adverse environmental impact on the vegetation will arise during this period of the project. During this stage most of the green waste would be produce. If it is not properly handled, due to these wastes the following adverse impacts may occur.

- Nuisance to the community
- Loss of land due to the waste dump
- Increase of biological growth (such as fungi)

#### 12.3.2. Mitigation

Any tree that could be replanted, shell be replanted in a different location. If any tree is cut and disposed as green waste, then the parts of the tree such as bark of it needed to be chopped down to smaller pieces and disposed it. Try to avoid cutting down of or uprooting of unnecessary vegetation.

### 12.4. Construction of the facility

#### 12.4.1. Impact

In this phase the reversible short term impact of dewatering would be a significant impact. The dewatering would accelerate the horizontal flow of the groundwater. This will have a impact on the groundwater depletion. However, with extensive dewatering, it may collapse the adjoining ground. If the dewatering is taking place near any existing facilities, this collapsing of ground may lead to physical damage to the existing facility.
Using heavy machinery for the construction work will raise extensive amount of emission from the vents of heavy machineries. It also uses heavy and dance fuel which may become a pollutant and may cause a disaster.

Sound pollution, accidental spills and other life loosing accidents could be prone during the construction phase.

12.4.2. **Mitigation**

In order to address the adverse impacts arise by extensively draining water from groundwater lens by dewatering, steal piling would be used to enclose excavation area. This will ensure the intact of soil near to the site and also will limit the horizontal displacement of the groundwater for a certain limit. However it is impossible to complete cutoff the horizontal flow, therefore grate care needed to be taken on monitoring the surrounding soil. If subsiding occurs in the vicinity, the dewatering needed to be stop immediately. In the case of subsiding the surface soil occurred, the depth of the steal pile needed to be adjusted before commencing the dewatering.

The hazardous material such as heavy oil and any flammable material shell be stored safely in barrels or appropriate containers with appropriate label and sign place outside of it. The used oil and other such material must be contained in appropriate containers with leakage proof, till it can be safely transported to Thilafushi for disposal.

In order to reduce the noise pollution, the work on site may not commence during the night. All the heavy vehicles and equipments shall be well serviced and maintained to reduce the unnecessary emission and incomplete combustion of the fuel.

When the workers present at the construction site, the safety helmet and safety shoo needed to be wear at all time. Even the visitors and other personal who may enter the premises during the construction is carrying on must also be equipped with the safety precaution. No personal shall climb a height no more than 12 feet without a safety belt. Sign boards, information boards and warning shall be displayed on the construction site in a way that people can see it easily. It shall be the responsibility of the site supervisor to supervise the safety of the workers and stored oil and chemical at the site on daily basis.
All the waste material produce during construction shall be disposed at Island waste Management Center. After backfilling the foundation the excess excavated material shall be disposed to the Thilafushi. In no condition these material shall be disposed to any costal area or any eroded area without prior consent of Environmental Protections Agency (EPA)

Apart from above mansion mitigation the following must be considered

- Ensure that hoisting equipment used to lift workers is designed to prevent uncontrolled descent and is properly rated for the intended use.
- Ensure that hoist operators are properly trained.
- Ensure that workers use 100% fall protection when working on towers at heights above 12 feet.
- Provide workers with a 100% fall-protection system compatible with tower components and the tasks to be performed.
- Ensure that tower erectors are adequately trained in proper climbing techniques, including sustaining three-point contact.
- Ensure that workers inspect their equipment daily to identify any damage or deficiencies.
- Provide workers with an adequate work-positioning device system. Connectors on positioning systems must be compatible with the tower components to which they are attached. (Note that a work-positioning device system does not constitute 100% fall protection.)

12.5. Operation of the facility

12.5.1. Impact
During the operation of Digital Terrestrial Television Broadcasting Network, its function is sending, receiving and relaying a radio wave signal with low frequency. This band of the frequency cannot be detected by human. For the biodiversity present in these islands, these waves will not have any significant impact. However each antenna will be equipped with indicator lights may have direct impact on bird community. Birds that are attracted to tower lights and aggregate in the lighting zone, circle the tower and collide with the tower, other birds, or fall to the ground from exhaustion (Longcore et al. 2012b, Gauthreaux and Belser 2006, Erickson et al. 2005).
12.5.2. Mitigation
The indicator light on all the tower shall be red light and the light shell be lit continuously throughout the night. This will reduce the confusion arise in the bird community. Any solid waste and the green waste from removal of grass shell be properly disposed at island waste management center. Any used oil or leftover paints and other chemical shall be leak proof packed and stored till it is transported to Thilafushi or any other such designated area.
13. Environmental Monitoring

The purpose of environmental monitoring plan (EMP) is to monitor or control the environmental effects of the proposed project. It is very vital to carry out proper Environmental Monitoring. Through the monitoring plane the potential negative impacts would be minimized. The unanticipated impacts that may occur during the construction period would also be mitigated through the monitoring. The purpose of the monitoring is to provide information that will aid impact management, and secondarily to achieve a better understanding of cause-effect relationship and to improve impact prediction and mitigation methods. The monitoring plane include noise level and groundwater.

During construction period, the following monitoring is conducted as shown in Table 13.1

**Table 13.1: Monitoring Plan for Construction Period**

<table>
<thead>
<tr>
<th>Environmental Item</th>
<th>Major contents to be conducted or inspected)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air quality</td>
<td>Measurement and Control of SPM, CO, NO₂, SO₂</td>
</tr>
<tr>
<td>Waste</td>
<td>Ensuring of disposal to the designated landfill</td>
</tr>
<tr>
<td>Soil contamination</td>
<td>Inspection of oil leakage maintenance, Collection and disposal of soil contaminated</td>
</tr>
<tr>
<td>Noise, Vibration</td>
<td>Measurement and Control of noise and vibration</td>
</tr>
<tr>
<td>Protected area</td>
<td>-</td>
</tr>
<tr>
<td>Ecosystem</td>
<td>Management of dewatering and emission from construction equipment and machines</td>
</tr>
<tr>
<td>Livelihood</td>
<td>Management of interference of residents path</td>
</tr>
<tr>
<td>Working condition</td>
<td>Instruction of occupational safety and wearing of safety tools</td>
</tr>
<tr>
<td>Accident</td>
<td>Formulation and instruction of safety role, implementation of safety measures for residents</td>
</tr>
</tbody>
</table>

Apart from the parameters in Table 13.1, the Table 13.2 shows the monitoring plan for both construction and operational phase of the project

**Table 13.2: Monitoring Plan**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Indicators</th>
<th>Baseline</th>
<th>Method</th>
<th>Responsible / cost in USD</th>
<th>Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groundwater</td>
<td>Changes in Electrical Conductivity and Salinity</td>
<td>Baseline to be reestablished immediately after construction is complete</td>
<td>In-situ and laboratory measurement</td>
<td>Born by the constructor 500 dollars per trip</td>
<td>• Monitoring Report 1 – at the start of the project</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Monitoring Report 2 –</td>
</tr>
<tr>
<td>Vegetation</td>
<td>Changes in the height of</td>
<td>Baseline to be reestablished</td>
<td>Onsite observation</td>
<td>Born by the proponent /</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noise level</td>
<td>Noise level at monitoring locations</td>
<td>Baseline to be reestablished immediately after construction is complete</td>
<td>Measuring noise levels using noise meter</td>
<td>Contractor/MHI 500 dollars per trip</td>
<td>during the project implementation</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------------</td>
<td>------------------------------------------------------------------</td>
<td>----------------------------------</td>
<td>---------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>grass</td>
<td>immediately after construction is complete</td>
<td>operator 500 dollars per trip</td>
<td></td>
<td></td>
<td>Monitoring Report 3 – 6 months after completion of the project</td>
</tr>
</tbody>
</table>

### 13.1. Monitoring Report
An environmental monitoring report would be compiled and submitted to the EPA six months after the completion of the project, based on the data collected for the monitoring the parameters included in the monitoring plan given in the EIA. The annual environmental monitoring report will include details of the site, strategy of data collection and analysis, quality control measures, sampling frequency and monitoring analysis and details of methodologies and protocols followed.

### 13.2. Cost of monitoring
It is estimated that during the project implementation phase, the monitoring cost would be US$ 15,000
14. Stakeholder Consultation and Socio Economic Impact
Energy Consultancy survey team visited the 22 project sites and held meetings with the island councils, stakeholders, NGOs and members from the public. Sometimes meetings were held with the island council and stakeholders together. Some occasions members from the community are also joined these meetings. In addition to this, survey team visited community places and houses to consult community members regarding the project. In each occasion, the survey team introduced the project and provided information and obtained views/concern regarding the associated environmental and social due to the Digital Terrestrial Television Broadcasting Network Development Project.

14.1. Dhidhdhoo
Council members are aware of the project and indicated their support for the project. In general public is not aware of the project. However, all the people that the team met said that they will support the project and indicated that other members of the community will support the project in general. Community believes that the new network will provide reliable better service to their island. Some of the criteria the community would like to take into considerations/implement include provision of sports channels, broadband internet service through the network. Some of the issues/concerns raised by the community include high maintenance issue and people would like to know information regarding proper maintenance. From past experience people raised the issue of lightning due to tower. During construction if vibration is there, then there might be damages to the houses. Community also suggested that there might be some impacts on children’s park, Harbor and Police station nearby and current cable TV operator also might be impacted. Overall, community is looking forward to see this project is implemented and better quality service availability and the project is expected to have positive impact. List for the people who were consulted in Ha. Dhidhdhoo is depicted below.
14.2. Kulhudhufushi
Council members are aware of the project and indicated their support for the project. In general public is not aware of the project. However, all the people that the team met said that they will support the project and other members of the community will support the project in general. Community believes that the new network will provide reliable better service to their island. Some of the criteria the community would like to take into considerations/implement includes HD quality cable TV service should be available and Internet service (WiFi) through this network. They also would like to see localized channels especially for this island and the service should be able to provide local announcements and advertisements. Some of the issues/concerns raised by the community includes high maintenance issue due to proximity to sea area (site is close to the shore. So maintenance will be high. Especially during south west monsoon season, sea spray is very high). Also it was suggested that it is important to take shore protection measures since the site is close to the shore. Overall, community is looking forward to see this project is implemented
and better quality service availability and the project is expected to have positive impact. List for the people who were consulted in Ha. Kulhudhufushi is depicted below.

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization or Address</th>
<th>Designation</th>
<th>Contact no</th>
<th>Signature/E-mail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ali Mohamed</td>
<td>K. Council / p.</td>
<td>President</td>
<td>7789689</td>
<td></td>
</tr>
<tr>
<td>Mohamed Aimeen</td>
<td>Kulhudhufushi Council</td>
<td>Vice President</td>
<td>9779909</td>
<td></td>
</tr>
<tr>
<td>Aminath Mojeedha</td>
<td></td>
<td>Council Member</td>
<td>7911628</td>
<td></td>
</tr>
<tr>
<td>Ibrahim Rasheed</td>
<td></td>
<td>Council Member</td>
<td>9833112</td>
<td></td>
</tr>
<tr>
<td>Ali Ibrahim</td>
<td></td>
<td>Security</td>
<td>9735066</td>
<td></td>
</tr>
<tr>
<td>Yagi Mohamed</td>
<td>Varudhee</td>
<td>Taxi Driver</td>
<td>9770666</td>
<td></td>
</tr>
<tr>
<td>Hussain Moosa</td>
<td>Police</td>
<td>Shop Owner</td>
<td>9994043</td>
<td></td>
</tr>
<tr>
<td>Khaddeiga Mohamed</td>
<td></td>
<td>–</td>
<td>7681331</td>
<td></td>
</tr>
<tr>
<td>Shiyama Ali</td>
<td>Manicure</td>
<td>Shop Keeper</td>
<td>9717471</td>
<td></td>
</tr>
<tr>
<td>Fadhilah Juhari</td>
<td>Psm</td>
<td>Technician</td>
<td>7901278</td>
<td></td>
</tr>
<tr>
<td>Adam Naseer</td>
<td>Theater</td>
<td>Fixman</td>
<td>9932332</td>
<td></td>
</tr>
<tr>
<td>Abdullah Weelad</td>
<td>Lua</td>
<td>Driver</td>
<td>9772009</td>
<td></td>
</tr>
<tr>
<td>Abdul Sadek</td>
<td>Kery A.</td>
<td>–</td>
<td>9936262</td>
<td></td>
</tr>
<tr>
<td>M. A. Gedford</td>
<td>Kery A.</td>
<td>–</td>
<td>745152</td>
<td></td>
</tr>
<tr>
<td>Abdul Rashid</td>
<td></td>
<td>Teacher</td>
<td>7988100</td>
<td></td>
</tr>
<tr>
<td>Abooba Lakwar</td>
<td>Hirudhu</td>
<td></td>
<td>7997112</td>
<td></td>
</tr>
</tbody>
</table>

Figure 14.2: List of personals who participate in public consultation at Kulhudhuffushi
14.3. Sh. Funadhoo,
Council members and some of the stakeholders are aware of the project. Some community members are also heard about the project through media and council and through a party who carried out some work related to the same project. Community members indicated that it is a good project and will fully support the project. The people that the team met also indicated that the other members of the community will support the project as well. Most of the community members said that the location is good, while others said east side of the area would be better. Some also suggested that harbor area is better since it will be easier to go and get service.

Some of the issues raised by the community include:

- It’s not good to construct antenna in residential area
- Increasing no of antenna will consume lands and other area and requested to use common tower
- Lightning to antenna is sometimes a fear for the locals
- Radiation in the long run
- Foreign channels might show some inappropriate content
- Some youths might stay there and do bad things
- Should construct tower away from local population
- Lightning may cause power failure in nearby houses (it should be avoided)
- Safety concern (work should be carried out after good study)
- The area is in waste/garbage area-local houses are there
- Increasing signals from similar antennas may cause interference to other services

Some of the criteria the community/council/stakeholders would like to take into considerations/implement include:

- Council would like to know who will look after the land during the operation-council is ready to take care of the area if paid
- It is important to communicate through atoll council to island council
- A feature that will allow the council to announce or advertise
- Nearest pond should be reclaimed
• Location should be separated and fenced
• CCTV should be there
• Even in future the land area should not be close to population
• Educational, culture and religious channels should be incorporated
• Once implemented and depend on the service, price should not be increased.

Community believes that project will have the following positive impacts:

• Quality signal
• Dissemination of warning messages
• Free channels
• Job opportunities
• More information

Overall, community would believe that the project will have positive impact and community will support the project. The people in general believe that the project will be a good project since it will improve the service. List for the people who were consulted in Sh. Funadhoo is depicted below.

![Figure 14.3: List of personals who participate in public consultation at Funadhoo](image)

14.4. N. Manadhoo
Council members are aware of the project and said they are well informed about the project. Some stakeholders and community members are also aware of the project. Community members indicated that the project is a good project and their full support for the project. The people that the team met also indicated that the other members of the community will support the project as well.
The people in general believe that the project will be a good project since it will improve the cable TV service quality. Most of the community members said that the location is good. However, most of the people suggested to share the infrastructure and asked “Why existing towers in the island are not used for this project?” Community member suggested using eastern side of Dhiraagu tower site.

Some of the concerns raised by the community include:

- High rise mast in a residential area
- Lightning risk
- Radiation
- A mast catering for all the users is needed

Some of the criteria the community would like to take into considerations/implement include:

- Boundary wall should be there
- Lightning protection should be there
- Security should be there
- Maintenance should be there
- Safety standard should be followed
- All the antenna should be in one mast
- Tower should be painted

Community believes that project will have the following positive impacts:

- Job opportunities for the local
- Will create income generating source
- Provision of social services
- Will create competition in the market
- Disaster warning delivery
- Income from the land
- Availability of public TV
- Cheaper price
- Good signal strength
It is believed that the project will have the following negative impacts:

- Radiation impact
- Damage due to disaster
- Falling objects from the tower

Overall, community would believe that the project will have positive impact and community will support the project. Community is looking forward to the project. List for the people who were consulted in N. Manadhoo is depicted below

![List of personals who participate in public consultation at Manadhoo](image)

**Figure 14.4: List of personals who participate in public consultation at Manadhoo**
14.5. ADh. Dhangethi
Council and other stakeholders are aware of the project. Some community members are also aware of the project. Community members indicated that the project is a good project and their full support for the project. The people that the team met also indicated that the other members of the community will support the project as well. The people in general believe that the project will be a good project since it will improve the service (current service is very poor). Most of the community members said that the location is good. However, the council has allocated a new location (see Annex 3), since the current location is planned for tourism development. Council also said that this new location has been identified through public consultation. Council informed that they have sent letters to Home Ministry and Housing Ministry regarding the new location and their decision to allocate this new area. The council also raised the question “Why existing towers in the island are not used for this project?” And council also suggested that it might be cheaper also. One community member suggested that the new proposed location is good and will enhance aesthetic value of the area.

Some of the concerns raised by the community include:

- Why existing towers are not used? Current location is tourism development area.
- Fee for the service might be higher than now
- There might be inappropriate channels for children

Some of the criteria the community would like to take into consideration/implement include:

- Fence should be there around the land area
- Sign board should be displayed
- All the basic channels should be free
- Sports channels should be there
- There should be a rent for the land area
- The area should be looked after (through a party or a staff)
- Price should be the same
- Educational, Religious, health.
- Free channels should be there
Community believes that project will have the following positive impacts:

- Might reduce price (fee)
- May provide job opportunities
- Improve emergency information delivery
- Service will improve (now very poor service)

It is believed that the project will have the following negative impacts:

- Radiation impact
- Will limit availability of land for other purpose
- If outsiders are given employment, it will impact the island

Overall, community would believe that the project will have positive impact and community will support the project. List for the people who were consulted in Adh. Dhangethi is depicted below:

![List of personals who participate in public consultation at Dhangethi](image)

Figure 14.5: List of personals who participate in public consultation at Dhangethi

14.6. V. Felidhooo
Council members and some of the stakeholders are aware of the project. Some community members are also aware of the project. Council raised many issues with the land area allocated to PSM. The council informed that the land area is currently not maintained at all and even there is no
boundary wall, no lights and no sign board. Council also informed that since the land area is not maintained, mosquitoes are breeding at the site. The proposed tower location within the boundary is so close to houses and requested to build the tower in the middle of the land area allocated. Council informed that they have sent letters to PSM highlighting these issues. Council believes that the community will not support the project due to the above issues. However, community members indicated that the project is a good project and their full support for the project. The people that the team met also indicated that the other members of the community will support the project as well. Most of the community members said that the location is good.

Some of the concerns raised by the community include:

- PSM land area is not maintained properly
- No boundary wall, sign board (name) and no lights
- Mosquitoes breeding at the site.
- From the existing towers objects falling-So from the project also same might happen
- Radiation impact
- Disruption of the service

Some of the criteria the community would like to take into considerations/implement include:

- Fence should be there
- Lighting should be there
- Area should be well looked after (cleaning and maintenance)
- Price should be lower than now
- Service should be of good quality
- Free channels should be there
- Educational, religious channels should be there
- Beach protection measure should be there
- Land rent should be paid
- First priority should be given to safety
- During dewatering, water should not be released to the sea

Community believes that project will have the following positive impacts:
• Might provide job opportunities
• Quality service
• Delivery of information during emergency
• Price might be low
• New channels might be available
• Food and accommodation for workers

It is believed that the project will have the following negative impacts:

• Might fall objects and damage properties and might harm people
• Radiation impact
• Might impact ground water quality-During previous tower construction water is released to sea

Overall, community would believe that the project will have positive impact and community will support the project. List for the people who were consulted in V. Felidhoo is depicted below:

![Figure 14.6: List of personals who participate in public consultation at Felidhoo](image)

14.7. Th. Guraidhoo
Some of the council and other stakeholders are aware of the project. Some community members are also aware of the project through news but (not informed by the council). Community members indicated that the project is a good project and their full support for the project. The people that the team met also indicated that the other members of the community will support the project as well.
The people in general believe that the project will be a good project since it is by the government. Some members also highlighted that in the past some projects got delayed and hope that this project will not get delayed. Most of the stakeholders said that the location is good. Some of the community members suggested reclaimed area as an alternative location.

Some of the concerns raised by the community include:

- Because of the project fishing area might be lost
- Current cable service providers may not be able to give service
- Might fall the tower and create a disaster
- There might be lightning due to the establishment of the tower (in the past also these kind of incidents happened)

Some of the criteria the community would like to take into considerations/implement include:

- Could provide job opportunity for the locals
- Small harbor should be used for safety and easy transport
- The allocated land area should be fenced

Community believes that project will have the following positive impacts:

- Emergency announcement feature is a positive impact
- Could provide job opportunity
- will help to build good generation through educational and religious channels
- May create an economic activity

Overall, community would like to see this project implemented and believes that the community will be involved in the implementation of the project. List for the people who were consulted in Th. Guraidhoo is depicted below:
14.8. L. Gan
Council members and some of the stakeholders are aware of the project. Some community members are also aware of the project. Community members indicated that they would like to know more information regarding the project and said that the project is a good project and provide their full support for the project. The people that the team met also indicated that the other members of the community will support the project as well. However, some suggested that cable TV operators might oppose the project. The people in general believe that the project will be a good project since it will improve the service. Most of the community members said that the location is good, while others said previous location is good for the project.

No critical issues are raised by the stakeholders and community members. Some of the criteria the community/council/stakeholders would like to take into considerations/implement include:

- Should get local channels
- There should be a way to provide information by the council to the community in case of emergency
- There should be separated and fenced around the area and responsible person should be identified and known.
- Prior notice should be given to FENAKA
- Council should be informed before dewatering
Community believes that project will have the following positive impacts:

- Fees might be lower for the channels
- Digital service to all
- Emergency information/announcement

It is believed that the project will have the following negative impacts:

- Might be expensive
- If outsiders are given employment, it will impact the island (Sometimes the contractors might interfere with the public)

Overall, community would believe that the project will have positive impact and community will support the project. List for the people who were consulted in L. Gan is depicted below:

Figure 14.8: List of personals who participate in public consultation at L. Gan
14.9. GDh. Fiyori
Council members and general public are aware of the project and indicated their full support for the project. They are also aware that some surveys were conducted (soil testing and Japan team visit) in the island. The people that the team met also said indicated that the other members of the community will support the project as well. Community is eagerly waiting for the implementation of the project as the TV service is very poor in the island. The people in general believe that the new network will provide reliable better service to their island. Community members raised the question whether the project will be implemented or not? And raised their concern that the project might not be implemented since there have been similar initiatives in the past. For example, some equipment’s were brought to the island previously to implement TV service by the government and the project was not implemented and the equipment’s are just sitting on the island. Community also raised concern regarding the current service provider (What will happen to the current services providers?) Some of the criteria the community would like to take into considerations/implement include:

- Children educational channels should be there
- More channels should be available
- Service should be sustainable
- Service should be cheap
- Some contents should not be allowed
- Sports channels should be there for youth
- Signal should not be interrupted
- Waste should be handled properly

Community also highlighted that the locals should be informed about the charges and why the amount is charged? and pointed out that they need information about channels that they will be getting.

Overall, community would like to see this project implemented as early as possible and better quality service availability and the project is expected to have positive impact. List for the people who were consulted in Gdh. Fiyoari is depicted below:
In addition stakeholders from the islands, government relevant agencies were consulted. None of the agencies had raised concerns regarding the project.

**Figure 14.9: List of personals who participate in public consultation at Fiyoari**
15. Conclusion

This EIA report covers the project of Digital Terrestrial Television Broadcasting (DTTB) Network proposed by Public Service media in order to migrate to digital broadcasting in Maldives adopting Japanese digital terrestrial television standards ISDB-T based on request of Communication Authority of Maldives (CAM)/Ministry of Home Affairs (MHA) to Japanese Government. The EIA was required for nine sites out of proposed 22 sites, and they are Ha. Dhidhdhoo, HDh. Kulhudhuffush, Sh. Funadhoo, N. Manadhoo, ADh. Dhangethi, V. Felidhoo, Th. Guraidhoo, L. Gan, and GDh. Fiyori. These 22 sites were screened, and a decision statements were issued by
EPA to carry out EIA under the Environmental Protection and Preservation Act (law 4/93) due to the vegetation clearance required for the above mentioned nine sites.

This project is believed to improve the information dissemination throughout the country. By introducing this 22 antenna would give a solution for the gaps in the current network.

The carried assessment shows that the main impact from the project to be improvement of dissemination of the information throughout the country and information would be delivered timely. The major environmental impact would be the vegetation clearance done in the proposed nine sites. A total of 273 trees would be required to remove from the allocated nine sites. Since these trees are removing from 9 islands, situated in different atolls, the cumulative impacts will be minimum. The proponent would give highest priority to relocate if any of the tree could be relocated. If backfilling is required for any sites, it contractor responsibility to source the required sand, therefore no dredging would be required for the project. Among the minor impacts, groundwater quality could be changed during dewatering, however this project do not involve any intensive use of groundwater in the operational phase, the groundwater quality would get normal with the infiltration of the rainfall. Therefore the change in the groundwater quality is considered to be short term negative impact.

Among the alternatives in the report, based on the soil condition, the proposed alternative of the antenna is suitable to establish in the islands of Maldives.

Although the project involves inevitable negative environmental impacts, such impacts are predicted to be not severe as not to undertake the project at the island. The project is justifiable in light of the socio-economic conditions and anticipated benefits resulting from the project, which seem to outweigh the negative environmental and economic impacts.
16. References

Chiles, JR [1997]. We got us some sky today, boys. Smithsonian 28:44–52.


17. Annex 1: Terms of Reference


No: 203-EIARES/PSM/2017/5

The following is the Extended Terms of Reference (ToR) following the scoping meeting held on 18th April 2017 for undertaking the EIA for Digital Terrestrial Television Broadcasting Network development project at ADh. Dhangethi, Ha. Dhiikhoo, V. Fileddu, GDh. Fiyor, Sh. Funadhoo, L. Gan, Th. Guraiddho, HDh. Kulhaddhuwhshi and N. Manadhoo. The proponent of the project is Public Service Media.

While every attempt has been made to ensure that this TOR addresses all of the major issues associated with development proposal, they are not necessarily exhaustive. They should not be interpreted as excluding from consideration matters deemed to be significant but not incorporated in them, or matters currently unforeseen, that emerge as important or significant from environmental studies, or otherwise, during the course of preparation of the EIA report.

1. Introduction to the project – Describe the purpose of the digital television broadcasting network development project and, if applicable, the background of the project and the tasks already completed. Clearly identify the rationale and objectives to enable the formulation of alternatives. Define the arrangements required for the environmental assessment including how work carried out under this contract is linked and sequenced with other projects that may be relevant to the current project. Outline how coordination between other consultants, contractors and government institutions will be carried out. List the donors and the institutions the consultant will be coordinating with and the methodologies used.

2. Study area – Submit a minimum A3 size scaled plan with indications of all the proposed infrastructures. Specify the agreed boundaries of the study area for the environmental impact assessment highlighting the proposed development location, size and important elements of the proposed digital television broadcasting network project. The study area should include adjacent or remote areas, such as relevant developments and nearby environmentally sensitive sites and residential areas, all economic ventures and cultural sites.

3. Scope of work – Identify and number tasks of the project including site preparation, construction and decommissioning phases. The following tasks shall be completed:

Task 1. Description of the proposed project – Provide a full description and justification of the relevant parts of the project, using maps at appropriate scales where necessary. The following should be provided (all inputs and outputs related to the proposed activities shall be justified):
Task 2. Description of the existing environment – Assemble, evaluate and present the environmental baseline studies/data regarding the study area and timing of the project (e.g. monsoon season). Identify baseline data gaps and identify studies and the level of detail to be carried out by consultant. Consideration of likely monitoring requirements should be borne in mind during survey planning, so that data collected is suitable for use as a baseline. As such all baseline data must be presented in such a way that they will be usefully applied to future monitoring. Data collection method should be outlined. Information should be divided into the categories shown below:

General climatic conditions:
- Rainfall information
- Hydrology/hydrodynamics
- Description of general wave conditions

The report should outline the detailed methodology of data collection utilized to describe the existing environment.

Ecology:
- Include a description of the flora within project location (if any)
- Location, number and types of vegetation to be removed; identify any protected trees that needs to be removed.

Socio-economic environment:
- Demography: total population, sex ratio, density, growth and pressure on land and marine resources;
- Income situation and distribution
- Economic activities of both men and women (e.g. fisheries, home gardening, fish processing, employment in industry, government);
- Seasonal changes in activities;
- Land use planning and natural resource use
- Accessibility and (public) transport to other island;
Task 3. Legislative and regulatory considerations – Identify the pertinent legislation, regulations and standards, and environmental policies that are relevant and applicable to the proposed project, and identify the appropriate authority jurisdictions that will specifically apply to the project.

Task 4. Potential impacts of the proposed project – The EIA report should identify all the impacts (direct, indirect and cumulative) and evaluate the magnitude and significance. This shall include:

Terrestrial impacts from construction
- Loss of vegetation and fauna from land clearance activities
- Ground water quality;
- Equipment, technical and spillage impacts during construction;
- Operational phase impacts from the project
  - Water quality
  - Vegetation

Social impacts:
- Odor and noise impacts;
- Aesthetics on-land
- Land use displacement and economic opportunities.

The methods used to identify the significance of the impacts shall be outlined. One or more of the following methods must be utilized in determining impacts: checklists, matrices, overlays, networks, expert systems and professional judgment. Justification must be provided to the selected methodologies. The report should outline all positive and negative/short and long-term impacts. Identify impacts that are cumulative and unavoidable.

Task 5. Alternatives to proposed project – Describe alternatives including the “no action option” should be presented. Determine the best practical environmental options. Alternatives examined for the proposed project that would achieve the same objective including the “no action alternative”. This should include alternatives for environmental, social and economic considerations. The report should highlight how the location was determined. All alternatives must be compared according to international standards and commonly accepted standards as much as possible. The comparison should yield the preferred alternative for implementation.

Task 6. Mitigation and management of negative impacts – Identify possible measures to prevent or reduce significant negative impacts to acceptable levels. Mitigation measures must also be identified for both construction and operation phase. Cost of the mitigation measures, equipment and resources required to implement those measures should be specified. The confirmation of
commitment of the developer to implement the proposed mitigation measures shall also be included. In cases where impacts are unavoidable arrangements to compensate for the environmental effect shall be given.

Task 7. Development of monitoring plan – Identify the critical issues requiring monitoring to ensure compliance to mitigation measures and present impact management and monitoring plan for:

- Parameters such as terrestrial monitoring.

Task 8. Stakeholder consultation, Inter-Agency coordination and public/NGO participation –

EIA report should include a list of people/groups consulted and what were the major outcomes. Identify appropriate mechanisms to supply stakeholders and the public with information about the development proposal. Major stakeholder consultation shall include:

- Ministry of Housing and Infrastructure
- Members of the general public.
- Atoll councils
- Island Councils
- Telecommunication Authority Maldives
- Maldives Civil Aviation Authority
- HPA

Presentation: The environmental impact assessment report, to be presented in digital format, will be concise and focus on significant environmental issues. It will contain the findings, conclusions and recommended actions supported by summaries of the data collected and citations for any references used in interpreting those data. The environmental assessment report will be organized according to, but not necessarily limited by, the outline given in the Environmental Impact Assessment Regulations, 2012.

Timeframe for submitting the EIA report – The developer must submit the completed EIA report before 23rd April 2018.

10th October 2017
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19. Annex 3: Site maps