Integrated Coastal Zone Management Project

Preparation of an Integrated Eco-Tourism Development Plan for Sagar Island in West Bengal and provision of Supervision Support during implementation of the Plan

Final Report Part A:
Final Integrated Ecotourism Development Plan

September 2013
### Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>BLOA</td>
<td>Bengal Launch Owner’s Association</td>
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<tr>
<td>Consultant</td>
<td>HYDEA SpA / Ghosh, Bose &amp; Associates Pvt Ltd</td>
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<tr>
<td>CBT</td>
<td>Community Based Tourism</td>
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<td>CBTC</td>
<td>Community Based Tourism Committee</td>
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<tr>
<td>DM</td>
<td>District Magistrate</td>
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<td>GSTO</td>
<td>Ganga Sagar Tourism Office</td>
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<tr>
<td>HNJPSS</td>
<td>Hooghly Nadi Jalpath Paribahan Samabay Samity</td>
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<tr>
<td>ICZMP</td>
<td>Integrated Coastal Zone Management Project</td>
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<tr>
<td>IEDP</td>
<td>Integrated Ecotourism Development Plan</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organization</td>
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<td>ODF</td>
<td>Open Defecation Free</td>
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<td>O&amp;M</td>
<td>Operation and Maintenance</td>
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<td>PHED</td>
<td>Public Health Engineering Directorate.</td>
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<td>PPs</td>
<td>Position Papers</td>
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<td>SCBTA</td>
<td>Sagar Community Based Tourism Association</td>
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<tr>
<td>SCZMA</td>
<td>Sundarban Development Board and State Coastal Zone Management Authority</td>
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<tr>
<td>SHG</td>
<td>Self Help Group</td>
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<td>SPMU</td>
<td>State Project Management Unit</td>
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<td>SWM</td>
<td>Solid Waste Management</td>
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<td>SWOT</td>
<td>Strengths, Weaknesses, Opportunities and Threats</td>
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<tr>
<td>TA</td>
<td>Technical Assistance</td>
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<tr>
<td>TOR</td>
<td>Terms of Reference</td>
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<tr>
<td>VIP</td>
<td>Ventilation Improved Pit</td>
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<tr>
<td>WBSTC</td>
<td>West Bengal Surface Transport Corporation</td>
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Introduction

As stated in the TOR, The Government of India has initiated a number of initiatives to reconcile the aims of protection of life and livelihood of coastal communities; conservation of ecological resources in the coastal and marine areas; and, promotion of economic activities that have necessarily to be located in the coastal regions. As one of the different initiatives, the Government of India along with the respective State Governments is implementing a World Bank financed project called the “Integrated Coastal Zone Management Project” (ICZM Project). The Project has specific objectives to support the long-term vision of the Government by (a) building national capacity for implementation of comprehensive coastal management approach in the country, and (b) piloting the integrated coastal zone management approach in the states of Gujarat, Orissa and West Bengal. The National Component of the Project focuses on expanding the institutional capacity and knowledge base needed for integrated management of coastal zones. The State Components include capacity building at the state level, preparation of integrated coastal zone management plans, and a range of complementary local pilot investments. Some of the pilot activities in West Bengal are located on the island of Sagar in the Sundarban. The project in West Bengal is being implemented by the State Project Management Unit (SPMU) in collaboration of several other government agencies (called PEAs).

HYDEA SpA and Ghosh, Bose & Associates Pvt Ltd (hereinafter jointly referred to as ‘the Consultant’) have been retained by the State Project Management Unit (SPMU) to provide technical assistance services to implement the assignment Integrated Eco-Tourism Development Plan for Sagar Island in West Bengal and provision of Supervision Support during implementation of the Plan.

The contract signed between the SPMU and the JV HYDEA SpA / Ghosh, Bose & Associates Pvt Ltd is referred to the specific activities to be carried out in Sagar Island with the purpose to develop basic infrastructures, organize a new ecotourism supply, and involve local population in the tourism development.

As stated in the ToR and Technical Proposal of the Consultant, the technical assistance is organized in three different Parts. Parts A and B to be implemented under the present contract, whereas Part C to be implemented under a separate contract only after acceptance by the Client (SPMU) of the previous two Parts.

This document represents the Final Report of Part A, including the final version of the Ecotourism Development Plan as it has been identified by the Consultant in collaboration with the SPMU and the other key actors of the project area.

This Final Report includes the ecotourism development policy and strategy that should have to be implemented by local stakeholders in the short. In addition, it includes a short summary of all project proposals and activities that are components of the Plan, including the analysis of their impacts and costs for implementation.
The present document is composed by a total of nice chapters, plus the annexes.

The first chapter, **Objectives, Methods and Scope of the Plan**, provides information about the general and specific objectives and the scope of the Plan, especially referring to its long term sustainability and the importance to involve local population in the tourism development. In addition, it includes a summary of methodology applied by the Consultant for the implementation of the present assignment.

The second chapter, **SWOT’s Analysis**, includes a list of the main Strengths, Weaknesses, Opportunities and Threats that are affecting the project area. These information are the main outputs of the analysis made by the Consultant with the Position Papers and it has been particularly important for the identification of the project proposals and activities composing the Ecotourism Development Plan. The chapter includes a list of suggestions to be considered for the identification of the ecotourism development strategy too.

The third chapter, **Vision and sustainable development pillars**, identifies the long term vision of the ecotourism development at Sagar Island and its four pillars that should have to be followed by local stakeholders for the implementation of the Plan and to make it long term sustainable.

The fourth chapter, **Sustainable ecotourism development model**, identifies the ecotourism model that will be implemented by local stakeholders for the tourism development of Sagar Island. The model describes how local population can be involved in the management of the ecotourism development and the tools that should have to be organized, including the Sagar Community-Based Tourism Council and its four Sub-Committees.

The fifth chapter, **Project proposals**, includes the list and details of all project and activities that compose the Ecotourism Development Plan. The description of each project and activity is a summary of the detailed description made in the Position Papers.

The sixth chapter, **Program implementation**, includes all information about the implementation arrangements, operation and maintenance management plan, monitoring and evaluation arrangements and the description of the regulations, standards, norms and values of the Plan.

The seventh chapter, **Estimated budget**, identifies all costs related to the Ecotourism Development Plan, including the program implementation costs and the costs of operation and maintenance of the identified infrastructures.

The eighth chapter, **Long term sustainability**, includes the analysis of the social, economic and environmental impacts generated by the ecotourism development of the project area. In addition, it includes information about the mitigation and management measures adopted when needed.
Finally, the ninth chapter, *Conclusion and recommendations*, includes the conclusions of the Consultant and the recommendations addressed to local stakeholders about the critical points to be considered during the implementation.

*Isometric Showing Mela Area and Proposed Developments*
1. Objectives, methods and scope of the Plan

The general objective of this Plan is to assist local stakeholders to implement the project proposals and activities identified by the Consultant, in collaboration with the SPMU, for developing the ecotourism supply in Sagar Island. It shall also have the following specific objectives:
1. to institutionalize ecotourism planning and management process in Sagar Island;
2. to promote advocacy on the concept and principles of ecotourism;
3. to introduce ecotourism businesses in Sagar Island both as a conservation strategy and an economic development option through viable business partnerships with the local government units or the private sector;
4. to promote inclusive equity of socio-economic benefits to the local community and encourage community participation.

Considering the quantity objectives of the Ecotourism Development Plan, they can be listed as follows:
1. to increase tourism flows to more than 500,000 arrivals in 2018 and 700,000 arrivals in 2023
2. to train more than 500 local people about tourism activities during project implementation
3. to aware at least 50% of local after project finalization
4. no person sleeping in the open
5. no assembly of more than 10 people waiting for road transport at any time and no assembly of at the ferry ghat more than 50 people
6. at least 40,000 visitors during mela time and 300,000 visitors within the year to the museum after 5 years of project finalization
7. at least 70 permanent shops open all year round after project finalization
8. at least 5 regional TTOOs promoting and selling tourism in the project area
9. the expenditure of tourists increases of at least 30% after one year of project finalization
10. At least 3 local NGOs after project finalization implementing training and awareness activities related to CTB development
11. At least 10% of total visitors at the museum are students
12. At least 200 permanent jobs created after project finalization
13. At least 40% of total employees are women, young and disabled employed in CBT activities
14. No open defecation incidences
15. Adequacy of toilet units (temporary, mobile and permanent)
16. 100% of waste is collected
17. 100% of waste is segregated
18. 100% of organic waste is composted
19. Burning of waste is eliminated to stop air nuisance and pollution
20. 100% of recyclables waste is recovered
21. 100% of non-recoverable waste is disposed in a landfill
22. At least 80% of tourists is satisfied about maintenance of the beach
Please, for more details see “Annex 1 – Monitoring and evaluation arrangements”

This Plan shall apply to ecotourism planning and management in Ganga Sagar area identified as having potential for ecotourism development. This may refer to the three project areas (core, buffer and peripheral zones) identified by the Consultant for the implementation of the project proposals and activities.

The methodology used for the identification of the Ecotourism Development Plan is based on primary and secondary sources. Regarding the primary sources, direct interviews were conducted with around 1,000 tourists and 50 vendors during Ganga Sagar Mela and the two months after. In addition, the Consultant has carried out personal interviews and working groups with local stakeholders in Sagar Island and Kolkata. Other than the SPMU, the important stakeholders for this assignment are: District Collector, Public Health Department (which oversees the management of the annual pilgrimage), Village panchayats of Ganga Sagar, Kapil Muni Temple Trust, Tourism Department, Sundarban Development Board and State Coastal Zone Management Authority (SCZMA). Finally, many meetings with community leaders have been held during and after mela time. Direct observation of relevant tourism attractions and events; retail of souvenir and handicraft products; and of tourism services (hotels, restaurants, transport services) for testing quality standards was conducted at the project area.

Regarding the secondary sources, official reports and studies published by the State Government of West Bengal as well as surveys released by other public and private institutions were considered as the most important. This information is regarded as very significant because cross-checks and hypothetical development of certain aspects in the tourism sector is possible - although not all of the secondary literature can be seen as reliable and/or plausible. Nevertheless, it serves for a decent background study of the tourism sector in Sagar Island.

Concerning the variety of research tools also the team of experts was composed by experts in different fields of actions according to their competencies. The Consultant managed all the actions (data procession, interviews, meetings, visits of international experts and field interviewers, identification of the project proposals, etc.) directly, which were accomplished at different times and locations.
2. **SWOT’s Analysis**

Based on the outputs provided by the Position Papers, it is possible to take out the main strengths, weaknesses, opportunities and threats of the present ecotourism organization of the project area. This methodology is a critical approach for identifying long term ecotourism sustainable model to be implemented by local public and private stakeholders.

<table>
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<th>Strengths</th>
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| - Destination already knew at national level for its religious attractions | - Very limited tourism infrastructures 
| | - Very low quality of the existing tourism infrastructures 
| | - Lack of professionalism of the staff 
| | - Lack of skills and competences about tourism sector at public and private level 
| | - Lack of self-sustainable tourism model adopted by local stakeholders 
| | - No organized tourism products in the project area 
| | - Lack of a clear urban and environmental regulation in the project area |

<table>
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<th>Opportunities</th>
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| - The new infrastructures and activities promoted by the World Bank program | - Limited collaboration among public-private tourism stakeholders and local communities 
| - Planning to build a bridge connecting the island to the continent | 
| - Ecotourism development as priority for the local and State policy in the project area |
Considerations for the ecotourism strategy:

The overall situation is unbalanced. Strengths are simply limited to the knowledge of Sagar Island to the potential tourism market, especially referring to the religious segments.

The general situation seems to be characterized by a disorganized tourism system in which the supply of services/facilities is very limited and strongly dependanting on individual initiatives, sometimes valuable, but hardly an integral part of an organic system of the ecotourism supply. In addition, the tourism supply is extremely seasonal, depending by the organization of three main religious events (Ganga Sagar Mela, Maghi Purnima Mela, Sarbani Purnima Mela, Durgapuja in the Villages and Pous Parban). Finally, apart of the religious interest of the site, the natural environment is a crucial attribute of Sagar Island and it serves as its main attraction. The Kapil Muni Temple area, and more particularly the land between the temple and the beach has been condemned for tourism, uglyfied by rows of destroyed concrete toilet blocks and hundreds of electric poles, only useful during the Mela. At the present, this area can not anymore be used as a tourism attraction.

Considering the present situation as summarized in the SWOT analysis, the ecotourism development strategy should take into account the following key factors:
  - training and aware compaign should have to be addressed to local communities with the aim to prepare them to the tourism sector (tourism quality and services and enviromental protection are the most important issues);
  - development of a very well organized public-private entity should have to be a must of the ecotourism develeopment model;
  - promoting the involvement of local population in the ecotourism supply;
  - a “code of conducts” should have to be developed for local population and tourists, especially referring to the using of public toilettes, solild waste system, environmental preservation, etc.;
  - local population should have to be directly involved in the management of the tourism infrastrcutres and activities with the aim to make ecotourism sustainable for the project area.

3. Vision and sustainable development pillars

As stated in the “Position Paper #3 - Overall employment generation proposal”, due to the fragile condition of the project area, both from the environmental and local population point of view, it is clear that the sustainable tourism development model of Sagar Island should focus mainly on these two elements. It means that, considering the particular organization of the tourism sector, where several actors and sectors should play together, local communities and related environment issues have to be put at the centre of the tourism development model.
In Sagar Island, tourism development has to become an opportunity for local communities in terms of job creation, additional revenues, heritage preservation and socio-economic development. Tourism services and infrastructures has been identified also taking into account the specific needs and present abilities of local population and tourism has to be developed in term of what local population can do and how they can benefit from tourism and not in terms of what tourists prefer for their holidays.

In the eighties and nineties tourists were still at the centre of the tourism development systems and all related activities were organized and developed in order to better satisfy them. These approaches were mainly based on mass tourism and development of big infrastructures (hotels, resorts, tourism centres, etc.) in order to satisfy their expectations. Local population was essentially excluded because of the huge investment resources needed for this kind of tourism development and, as already said before, negative impacts were more than the few positive ones.

The sustainable tourism system in Sagar Island will be an integrated tourist model which stimulate the integration of both tourists into local culture and local inhabitants into the benefits generated by tourism development. In this way, local cultural heritage, handicraft production, local gastronomy, etc., are excellent tools not only in order to diversify the tourism supply, but also for including local population in the economic development.

In Sagar Island the centrality of the local communities is a must for the tourism development and the sustainable tourism development of the area will be based on the following four pillars:
These four pillars are very important because it is clear that there is not sustainability if the present project only finance infrastructures. The real long term sustainability in Sagar Island is guaranteed when local population is completely integrated in the tourism supply and benefit from it. Local population is not used to manage and develop tourism activities, so that the four pillars are very important key elements of the ecotourism development strategy.

- **Awareness**: tourism is a recent sector in Sagar Island economy and local communities, still extremely poor, do not know the mechanisms of the tourism industry, and how it can impact on their social and economic life. It is important to prepare local populations to the tourism sector in order to spread, as much as possible at local level, a tourism mentality of residents. An awareness campaign and education activities are needed in order to involve local residents into the tourism sector.

- **Knowledge**: the majority of local people come from micro-activities related to agriculture, fishing or commercial sectors and most of them have very limited skills and competences on how to manage and develop a tourism development enterprises. A portion of the local population is directly or indirectly involved to tourism activities during mela time, however, there is a general lack of knowledge related to the tourism organization, services, and characteristics of the tourism demands and promotion and commercialization channels that need to be faced in order to place Sagar Island in a competitive way at national and international level. Training activities are requested at all level, including public and private sector.

- **Assistance**: the integration process of local communities to the tourism sector should have to be implemented through a permanent technical assistance. Local residents, interested to invest in tourism sector, should have to be assisted in order to run their own micro-tourism enterprise. Due to the poor condition of local residents, the assistance should be mainly focused on the
organization of special financial funds (grants and loans) to be managed by local government (in collaboration with local banks) and used by local population.

- **Collaboration**: a real integration of local communities in the tourism sector need to pass through the collaboration with public and private tourism stakeholders. And, as already proved in other tourism destinations, in Sagar Island it can be reached through the development of a very important tool, that it is the organization of a *Community Based Tourism Committee (CBTC)*, which includes the representatives of local population, local government and the representatives of the private sector. Please, see the Position Paper on Tourism for more details about the STC.

### 4. Sustainable ecotourism development model

Based on its four pillars, the ecotourism development model has the following main objectives:

- to formulate relevant and efficient tourism rules and regulations in the area;
- to be suitable for the local social framework;
- to allows local population to directly benefit from tourism development;
- to allows local population to define themselves the tourism policies and strategies of the tourism development in Sagar Island;
- to enable the community, at the completion of the project, to take control of the whole activities in a sustainable manner.

As tourism is a new activity, involving several different expertise and professions, there need to be a model of governance suiting the different expectations and enabling the tourism revenues to be equitably shared among the people involved in the activities and the community members as a whole.

The complexity of the tourism development, and of its features as they are present in Sagar Island and surrounding area, requires a solid and flexible organizational structure, in order for the strategy for the sustainable development of ecotourism to be effectively implemented. The lessons taken from foreign experiences cannot be automatically copied: they provide us with an important methodological approach, since they point at the most frequent mistakes generated by the willingness to attract mass tourism due to its dimensional relevance. And they show effective strategies based upon the respectful combination of local needs and rights on one hand, and external expectations on the other.

Based on what said before, the organizational structure of the ecotourism development model should be rather simple. The management of the tourism infrastructures and activities that will be implemented during Part-B of the present assignment does not require any strong regulation or radical intervention. The present experience of local population about the organization of Ganga Sagar
Mela and the other religious events during the year, will facilitate any process of development without altering its features.

The ecotourism development model is the result of a varied and heterogeneous participation, and it must be managed with reference to a range of activities. It is necessary to highlight that the ecotourism development model essentially needs fine tuning of joint action, co-ordination and unitary external relationships.

Due to the present situation of local community, the other main stakeholders involved in Sagar Island and the project proposals identified by the Consultant, the following organization of the ecotourism development model is proposed:

*Fig.3: Community-Based Tourism Governance Model*

The Consultant will help local community and the other stakeholders of the project area to implement the present model during Part-B of the present assignment. This is not only because it is allowed by the Terms of Reference, but also because the stakeholders have the responsibility to organize and ensure an effective management and implementation of CBT objectives and principles in the area. Roles and responsibilities of all involved actors need to be defined during the implementation of the tourism infrastructures (Part-B of the present assignment).

- **The Sagar Community-Based Tourism Council**
It sets the strategy, supervises all the activities, carries out transversal projects, and manages the financial tools of the Council. It is composed by a total of 5-7 people (representatives of the public sector, the Local Communities, the religious authority and tourism professionals), including a Director General. Its main activities can be listed as follows:

- coordination with the Tourism Department, Panchayats, SIDC and all key stakeholders for the responsible development and promotion of the destination;
- coordination with the Rural Management and Development Department for infrastructure development such as, water, sanitation and village trails;
- assistance from the government organizations, universities, national and international museums, experts and other resource persons members of the Advisory Committee;
- set up of guidelines for CBT activities, in consultation with the key stakeholders including NGO, local communities, tour operators and relevant government authorities;
- monitoring of the CBT activities to minimize negative impacts on the ecosystems;
- monitoring the trainings and capacity building carried out by the local NGOs.

The CBT Committee/s
In such a framework, the core of the ecotourism model is represented by the system of committees, where all community based tourism activities are managed and implemented. This system is composed by a general CBT Committee and four different Sub-Committees. The general CBT Committee is composed by one director (interacting with the Council) and four representatives, one for each Sub-Committee. Under supervision of the Sagar CBT Council, the CBT Committee implements the needed activities. It works in coordination with local NGOs, Panchayats, SHG and other local partners engaged in CBT. It is responsible for CBT planning and development, financing, day to day management and monitoring:

- implementing the CBT guidelines;
- monitoring the revenue generation and allocation of funds for the development of CBT;
- working in close collaboration with NGOs and villagers organizations to implement the activities;
- managing the website, publishing newsletters and reports and ensuring the destination promotion;
- monitoring the environmental impacts which are caused by tourism activities and taking relevant measures to mitigate them;
- monitoring the training and capacity building programmes conducted by local NGOs and provide them support and cooperation.

While the Sub-Committee will be composed by a maximum of 3-5 people that will be responsible for the coordination and monitoring of the ecotourism development activities.
The **Sagar CBT Association** (SCBTA) represents the local villagers and associations and plays an active role as local advisory committee, particularly in terms of environmental sensitization, infrastructures development location and activities to be developed.

Finally, an **Advisory Committee** is requested and it will be composed of resource persons who help the association in pursuing its objectives by giving technical guidance (professor of some Universities in Kolkata, Director of the Museum in Kolkata, TAAB, etc.).

**Community-based tourism activities’ portfolio**

Tourism activities selected for the Kapil Muni Temple area take into consideration that the place is an important religious pilgrimage location but has the opportunity to attract all-year round tourists, particularly weekenders and families from Kolkata. Community-based activities will propose interaction with local villagers and discovery of this unique Sundarbans land, where water is omnipresent, between the Ganga River, the Bay of Bengal, mangroves and rice paddies.

Tourism activities are represented by sport activities, land-based and water-based:
- **Boating**: Different kinds of activities can be proposed with local fishermen, from visiting the islands and the mangrove (excursions, sunset tour…), to fishing with local fishermen;
- **Cycling**: around the villages on a platform rickshaw with a driver to visit the villages or in autonomy with mountain bikes;
- **Hiking**: and visiting the temples and the villages with a local guide.

Cultural activities are represented by:
- Learning from the Museum exhibitions and being sensitized to environmental preservation;
- Visiting communities and artisans, looking for local printing techniques and handicraft, eating fresh fish in a Self Help Group restaurant…;
- Following mediation and yoga courses;
- Participating in folk music festivals and performances, or in conservation activities.

5. **Project proposals**

The Ecotourism Development Plan is composed by the following infrastructures and activities approved by the SPMU:

- **Cultural infrastructures**
  - Museum and interpretation centre
  - Nat Mandir
  - Dhala Arcade
• **Basic infrastructures**
  - Bus station
  - Sanitation
  - Awareness campaign on Open Defecation Free Zone for Mela Ground
  - Drainage system
  - Solid Waste Management
  - Awareness campaign on solid waste management

• **Tourism facilities**
  - Ecotourism camp-site
  - Home-stays
  - Ganga Sagar Tourism Office and Community Shop
  - Community managed restaurant & Café
  - Other facilities (Kid playground, open terraces and picnic tables on the beach)

• **Institutional development**
  - Community-Based Tourism Capacity-building and Training
  - Community-Based Tourism Governance Model

• **Landscape improvements**
  - Tree planting
  - Removal of wirings

• **Other Facilities**
  - Greenhouse
  - Biodiversity interpretation centre
  - Centre for art and crafts
  - Handicrafts exhibition centre

### **Cultural Infrastructures**

**Museum and interpretation centre**

Based on the Reports and Position Papers prepared and approved during Part A, a final design has been produced for the Mythology Museum and Sagar Island Visitor Education and Information Centre. The site chosen adjacent to the Sundarban Affairs Office was approved by the District Magistrate, and Mela Committee on the site visit of July 24th.

*Design Objectives:* The proposed scheme is designed for all visitors to the Gangasagar Mela, and the other festivals and events on the Island. It is designed as a multicultural institution representing all the indigenous people and religions on the island, and provides history,
cultural information and environmental education for all visitors.

Pic#1 – Museum and Interpretation Centre

The entry to the museum is proposed from two locations, during the Mela, special bridges operate to the areas near the current visitor facilities at the North of the Mela Ground, and also from the main roads approaching the site. This allows large numbers of visitors to be managed safely. Outside the Mela times the entrance is opposite the main Sundaraban Affairs office, and allows for maximum security.

The entrance area is designed also as an Open Air Theatre, this allows the visitors to be seated and organised for their visits, before they are guided around. The Theatre also provides space underneath for toilets, shops, café/restaurant and museum offices and storage. This keeps these activities outside of the main buildings, and so reduces pollution risks inside.

Pic#2 – Sections of the Museum and Interpretation Centre

The main museum is raised on a platform 1m above the main flood levels, and is first entered on the ground floor. Here the visitor sees an exhibition on the Mythology of Gangasagar Mela, followed by information on the religious events of the island, including other religions. The second exhibit is on the archaeology of the island, and the history of the Mela at this site, including displays on recent excavations and discoveries on the site and where they can be visited. The third exhibit is the ethnography of the local people, who represent many different people from across India, and the background of the different Pilgrims. The centre of the space has a large stone map of India showing Pilgrim Routes, and the important local Ganga River sites for pilgrims to visit.
The visitors then proceed by the external ramps to the first floor, where they see an exhibition on the wildlife, marine life and flora of Sagar Island and the Ganga river, and where this can be visited. The next exhibit looks at the ecology and geological formation of Sagar Island and how it is changing under the effects of global warming and modern development, and where these changes can be seen in the area. The final exhibition is on the impact of visitors on the Gangasagar area, and addresses what visitors can do to improve their local environment, and how individual responsibility can transform an environment. It provides information on Ecotourism, Eco-tourist visiting, campsites and homesteads.

Finally the visitors proceed by the external ramps to the top floor, where a circular AV room provides a film about the Gangasagar Mela and its cultural and environmental significance. The same room can be used for teaching and meditation centre outside of the Mela time. Finally the visitors walk out on a balcony overlooking the Mela ground where they can see the huge crowds, and the impact on the environment can be realised. They then walk down on the opposite ramp and exit past the shop and café, and children garden.
Outside of Mela time the museum provides multi cultural activity space, and also information for pilgrims, tourists, and eco-tourists on what to do and see. The museum is designed to be a modern institution presenting the most recent information on the region. It is built of brick with modern external ramps to give a sense of solidity and innovation.

At Mela time it can accommodate 25,000 visitors a day, allowing most visitors a chance to visit over the 10 day period. Outside of this, the 70,000 local visitors and 50,000 tourists have a chance to visit in slightly less organised structure, and a smaller internal stair case is provided for them. The Café Restaurant provides local food year round for visitors, and supports the local staff.

The exhibitions are developed in conjunction with the Indian Museum Ethnology and Geology Departments, the State Archaeological Museum and the Nature Environment and Wildlife Society. A web site and digital information platform will be created to allow for visitors events and visits to be organised. The daily administration will be locally run, with exhibition improvements from the supporting institutions provided on a regular basis.

Pic#5 – Museum and Interpretation Centre Interior

Nat Mandir

A large hall with all side open but facing the temple is generally required for pilgrims during mela time as well as for general tourists throughout the year. At this moment within the space available, we can thought of a shelter accommodation approximately about 500 people (Area 600.0 sqm approx). The architectural characteristics of this should be as per the common sentiment of the visitors and stakeholders & accordingly may be derived from the traditional temple structures of Bengal.

A pond may also to be considered for tourists and pilgrims for having a dip after sea bathing. At least for their hand, foot & face wash as is the traditional practice.
At present, there is a pond which is fairly deep but its water increases during high tide. This requires to be re-excavated and its bank, requires to be properly shaped with a bathing ghat.

**Pic#6 – Plan of the Nat Mandir**

**Pic#7 – Drawing of the Nat Mandir**

**Dala Arcade:**
At present there are about 110 shops with temporary bamboo structures and tarpaulin roofing. These are erected all along both side of the central concrete road from Mandir to the beach area. These shops required to be organized and may be sheltered under one roof with permanent structure. As the Client desires and as per the common peoples sentiment this structures may be similar or at least have the
characteristics of the Dala Arcade adjacent to temple at Dakshineshwar in Kolkata.

*Pic#8 – Location of the Museum, Nat Madir and Dhala Arcade*

### BASIC INFRASTRUCTURES

#### Bus stand

The need to improve the existing bus facility at Ganga Sagar is crucial as the bus frequency can reach a maximum of one bus per 1-2 minutes for a considerable amount of time during the mela and a rationalization of the Bus Station can improve the download and upload of passengers as well as improve the bus maneuverability. The new bus station will include: bus parking lots; toilet and drinking water facilities for passenger, transport operator staffs and drivers; transport operators office; bus repairing facility; rickshaw and cycle van stands; Tourist Information Office; Fire Tender Shelter and Water Panel with Water Tank for Fire Fighting. The proposed bus stand includes 40 parking bays.
Sanitation

The consultants have proposed that the objective of the sanitation component will be to achieve Open Defecation Free (ODF) Ganga Sagar mela through resource creation in the form of new toilets and extensive awareness campaign among the pilgrims involving local people.

Additional number of units to be set up is a critical parameter. Considering an user load of 100 per toilet unit, around 1300 toilet units (precisely 1320) are required to serve the estimated average present daily peak pilgrim population in mela. So, to supplement the existing permanent units (680 nos including the mobile toilet vans), 620 additional toilet units are required. Based on the projected mid-term (5 year later, in 2018) peak daily pilgrim population in the mela, the requirement of total toilet units will be around 1500 (precisely 1530). Considering the recent reports on low utilization (around 50%) of the toilet resources created under different rural sanitation program of the Government of India (under Total Sanitation Campaign), lack of public awareness campaign in the mela ground and the uncertainty over future growth in the pilgrim flow, the consultants propose to provide lower number of toilet units and emphasise more on campaigning among the pilgrims to promote utilization of toilets.

In case 100% utilization is achieved for these new toilets and the pilgrim flow increases in a pattern considered here, additional 200 units can be constructed by 2018.

The proposed toilets will be constructed in the blocks of 6, 10, 20 units. These toilet blocks will be located at strategic positions like by the side of the five roads leading to the mela and experiencing heavy pilgrim movement, at the Bus stand, near the fishermen’s village, on both side of the tidal creek, near the beach area) and at different locations within the mela area to enable faster access.
After reviewing all the conventional onsite sanitation technologies in use in India (like Dry systems like urine diversion dry toilets (UDDT) or ECOSAN toilets, Ventilation Improved Pit (VIP) Latrine, Trench/Pit latrine and wet systems like pour flush toilet with pit, single pit/twin pit water weil toilet, toilet with septic tanks and soak pits), it was observed that the newly introduced ecofriendly toilets are suitable for the purpose of Ganga Sagar mela. It is found that Eco friendly toilets based on the Zero discharge toilet technology is not yet commercialised enough for large scale implementation and its operation and maintenance requires additional set up and trained personnel. But the bio digester based onsite sanitation units (based on of the anaerobic technology developed by Defece Reasearch and Development Organisation or based on the aerobic digester technology) are easy to construct and have low operation and maintenance cost. The Septic tank and soak pit based units are presently in use in the mela area and could not be considered as a suitable alternative despite being used in abundance at present due to the problem of septage management. Leach pit based units can be set up at the location close to the beach, where the soil is mostly sandy. Mobile toilet vans provided with in-situ treatment arrangement will be provided for the beach areas, to facilitate the pilgrims taking holy dip. Thus a combination of the Eco friendly toilets, leach pit based toilets and the

**Material of Construction** Considering high pilgrim flow only during the period of the mela and problem of future maintenance during non mela periods, the toilets blocks will be semi-permanent in nature, with the substructure and one or two units in the superstructure will be made permanent (with brick mortar and RCC). The super structure of the temporary units will constructed with locally available like Hogla or GI sheets (for easier reusability) with framed tin doors (to ensure better comfort level of the users). These will be dismantled after the mela. The squatting pans in the substructure part will be covered by pre cast concrete slabs or two layers of tarpaulin sheets. Sufficient illumination and water supply to the toilets (running water to each unit or to each block) will be made available from existing infrastructure system.

Operation and maintenance of the toilets during and after the mela will be done exclusively by local people. They will be provided necessary training. The permanent units of the semi permanent toilet blocks will be operated as pay and use toilets after the mela . Small groups will be formed from the local people for maintenance of the toilet unit during and after the mela. They will be endowed with the responsibility of maintaining the substructures through out the year. This
will ensure proper maintenance of the resources created and generate local employment.

**Awareness campaign on Open Defecation Free Zone for Mela Ground**
The mela will be declared as an **Open Defecation Free (ODF) area**. Extensive awareness campaign among the pilgrims for preventing open defecation or urination will be done through
- Print, audio, visual media, public announcement in the mela area, use of signage and distribution of leaflets etc. and imposing penalties on the violators
- Involving NGOs who are also working for sanitation campaign in the similar religious congregation in the Northern India (as substantial part of the visitors are from North and Western India)
- Extensively involving local people in different activities (like cultural programs, interfacing with the local people, assisting the mela authority in identifying the offenders etc.) related to public awareness campaign through proper training and CLTS initiatives.

**Drainage**
The drainage system in the mela ground consists of two components:
- **Stormwater management**: The portion to the North of the mela ground contains a number of low lying areas, pond and agricultural land. So a structured drainage network in that area will not be required. To ensure that the areas in front of the Kapil Muni Temple is not flooded and the wash water etc. generated from the proposed installations like Nat Mandir, dala arcade, roadside drains will be provided for roads 2,3,4.
- **Prevention of tidal ingress to mela ground**: Construction of tide control gates at both ends of the creek flowing behind the Kapil Muni Temple. It should be a combination of sluice and flap gate. The sluice gates will be operated manually during periods of very high tides. During normal periods, the sluice gate will remain partially open to facilitate entry of tide water to the creek for flushing it and maintaining the tide supported ecology on both banks of the creek.

**Solid Waste Management**
The SWM system will be designed to run throughout the year and the SWM team will be supplemented by the PHE team during the Melas. Main features are summarized below:
- Waste bins will be located in the Mela Ground so that tourists can use them avoiding to litter the ground and the beach.
- **Primary collection** will be implemented by hand carts. The same carts used by PHE during the Mela can be used to empty street bins.
- Waste collected shall be conveyed to three Manual Segregation Facilities operated by freelance refuse workers which will make their living selling the recyclable waste. The same will function also as **Transfer Stations** before final disposal of residual waste.
- A **composting plant** nearby the main segregation facility # 1 will treat the biodegradable waste. A shredder will be used to reduce the size of the
material and a crashing unit will be used for coconut shelves. The whole system will be designed to cover the needs during the Mela times therefore it will be largely sufficient in smaller Melas and during low season.

After discussion with relevant stakeholder the 3 SWM units functioning as both sorting facility and transfer station will be operational during the Mela whereas the centralized windrow composting plant treating the organic waste of the whole mela ground will function all year around to treat the waste of the local markets. This option was approved by SIDCL with letter 109/1(2)/ED/SIDC/ICZMP-1/12 of 6/6/2013.

SWM in the Mela Ground is the ideal case in which reduction/recycling policies should prevail on the idea of building a sanitary landfill. The following table shows a partial lists of possible actions which are included in the plan:

<table>
<thead>
<tr>
<th>Principle</th>
<th>Action</th>
</tr>
</thead>
</table>
| Reduce    | - Enforce the restriction to forbid the use of plastic in Sagar Island. For example forbid the use of plastic disposal dishes and use instead pressed leaves plates (salpata)  
- Install water purification systems in tourist facilities (e.g. Larica Hotel) to avoid the use of bottled water  
- Propose a **Zero Waste Mela 2015** |
| Reuse     | - Promote the use of reusable dishes in tourist facilities avoiding the use of disposable items |
| Recycle   | - Recycle glass, plastic, metals, paper by separating these from the waste flow  
- Use biodegradable waste to produce compost  
- Explore the possibility to produce oil with coconut shelves  
- Explore the possibility to use coconut shelves for handcraft products |

**Awareness campaign on solid waste management**

The Consultant will develop a strategy for communication to minimize solid waste generation and its indiscriminate disposal with the use of street signs in strategic locations from Kolkata bus Station and all along the start of the transport route from the Lot-8 jetty to Kachberia jetty and along the road leading to Ganga Sagar informing of the ban on the use and transport of plastics to Sagar Island.

In line with the plan of local authorities the Consultant will propose Ganga Sagar as Plastic Free fair and will propose the vision of Zero Waste Mela 2015 for Gangasagar Mela 2015 (in terms of zero waste to be disposed). This shall be developed in detail with full collaboration of relevant stakeholders.

Similarly to what done this year during Mahakumbh Mela NGOs shall be involved for the implementation of the awareness campaign. The Consultant will evaluate several options such as local ONGs and groups, or the same ONGs who worked for Khumb Mela.
Possible actions to be implemented during the Mela are the following:

a) Short duration film (1 minute), highlighting how people should behave in order not to pollute the mela ground and the Ganga, can be displayed at several locations. This shall include faces and messages of eminent personalities to make good impact among common people.

b) Sagar Island and the Mela Ground has a limited number of entry points so it is possible to forbid the entry of plastic in the mela by keeping strong vigil in this points

c) Vendors may be given a reduction in the rentals if they commit to use paper bags, salpata plats, etc. instead of the plastic items. Also they will have to make sure that users dispose of waste in the bins provided by the future SWM scheme otherwise they will have to pay a penalty.

**TOURISM FACILITIES**

**Community Campsite**

The project consists in the construction of a low-cost community-managed Campsite equipped with 30 permanent bungalows. There will be 2 models of bungalows, for 2 to 6 people. These bungalows will be wooden (for 2 people) or half-tented for easy removal, storage and maintenance. The campsite will offer facilities (maintained toilets and showers, Internet access…) and extra services (rental of badminton sets, cycles, books…). The site will be appropriately beautified with local plants and the management will be done by local staff under supervision of the CBTC.

As far as possible, the campsite will be equipped and will promote the use of renewable energies and sustainable consumption.  

The Campsite is located between roads 4 and 5, between the Tourist lodge complex being built by the Ministry of Tourism and the bus stand (Fig.1). Opposite to the Campsite and set in the building constructed on the Project Implementation Cell’s land (a very convenient location close to the hotels, the Interpretation Center and the N°2 Bus station), the Community Facility Centre hosts the administration and maintenance offices of the Campsite.
Pic#10 – Plan of the Campsite

Pic#12: Suggestions for bungalows and tents:
Community-based Homestays
The plan proposal consists in the organization and development of a guest-houses service directly managed by local community, enabling activities development and cultural exchanges.

This option consists in the organization of 5 homestays in the surrounding villages. Tourists can stay overnight and share village life at selected community houses. The houses will be selected from voluntary families, according to their visual and cultural interest (location, sightseeing, architecture, etc.). The motivated voluntary families, members of the SCBTA, will be trained on basics of CBT (Cf. "Institutional Development").

5 houses will be selected in 5 villages (one family house per village), located within the buffer zone (5 km around KMT) including:
- Gangasagar
- Beguakhali
- Natendrapur
- Purrusottampur
- Sibpur

Ganga Sagar Tourism Office and Community Shop
The GSTO is in charge of 3 main activities:
- The information of the public (tourists and pilgrims) re transportations (bus and ferries time schedules, taxi fares…);
- The promotion of the place, towards tour operators from Kolkata and other places through the presentation of the attractions of the area and the different cultural and leisure activities, displayed in the Museum and in the villages. The GSTO will offer:
  - Free maps of the area,
  - Interpretation leaflets,
  - Information about the issues in this region and the local initiatives that are being taken…
  - The promotion and commercialization of the community activities:
    - Booking of homestays accommodation,
    - Bicycle rental and tourist platform rickshaw booking,
    - Boat trips (canals and mangrove excursions, sunset tour…),
    - Guide hiring,
    - Taxi booking…

GSTO will host The Community Shop, which will develop, promote and sell community-made local handicraft products adapted to city tourists expectations (design and style):
- Local organic food items as pickles and jams;
- Tie-dye and stamp clothes (pyjamas, saris, longhis, scarves, table clothes, cushion covers…),
- Handicraft made from local natural fibers and straw (baskets, mattresses, hats), iron and wood artefacts, recycled products (using plastic, tyres…)
- Locally-made offerings to be sold to pilgrims for pujas in the temple;
• Postcards, souvenirs (different from the ones available in the Dala Arcade), books and guides relevant to the site and the museum themes and displays (religion, mythology…).

The community-ruled Ganga Sagar Tourism Office and shop will be located in the eastern wing of the ground floor of the outside amphitheatre, at the entrance of the museum, near the restaurant & café and the Museum office. Its surface is 60sqm.

Pic#13: Facilities located under the amphitheatre

Community Restaurant & Café
The Community Restaurant & Café is run by a Self Help Group of local women, members of SCBTA, who display and sell their own specialties, made with local organic products.

The goal of this restaurant is to:
• provide original recipes made from local women, promoting local organic products;
• enable the development of packaged food items made by the women SHG (a specific brand could be created to market local organic products);
• retain visitors in the Museum and make it an activities’ hub;
• create full-time employments and extra employment during Mela time.

The community-ruled restaurant & cafe will be located in the eastern wing of the ground floor of the outside amphitheatre, at the entrance of the museum. Its surface is 60sqm, with an open-air terrace shaded by trees.

Run by women members of the SCBTA, it sells traditional meals found in local restaurants, with an emphasize on their own home specialties, made as far as possible with local organic products.

Other facilities
Other planned facilities include:
- 1 kids playground, located in front of the new restaurant;
- 1 exercise trail along the west side of the beach, consisting of 10 halts with wooden poles assembled for exercise purpose, spread along a 1 km trail on the sand under the casuarinas and along the fishermen’s village;
- 10 open terraces on the beach, made of wood, covered with straw and containing fixed tables and benches; they are disposed every 100m, 50m above the high-tide level;
- 20 picnic tables and benches, locally built, disseminated on the Mela ground.

**INSTITUTIONAL DEVELOPMENT**

With the purpose to assist local stakeholders to set up the ecotourism development model, including the CBT Council and the CBT Committee and its Sub-Committees, the Consultant will organize specific training activities during the first phase of the implementation of Part-C of the present assignment.

This capacity building and training activities will be as follows:
- Capacity building of the organization in charge of the implementation of the communities’ trainings (“Train the trainers” activity) in the first stage of the project;
- Training of the defined community members involved in the different activities;
- Capacity building of the CBT Committee (CBTC);
- Sensitization of the communities on the need for conservation.

Although capacity development programs are common in Sagar Island on several topics, Community-based tourism (CBT) is a new concept; as the actual tourists are all religious pilgrims coming for the Temple, even the basics of tourism activities are new to the majority of the population.

For the success of mobilization, the CBT component of the main project needs to be managed on the long run by a local infrastructure: the CBTC is in charge of this aspect.

The CBT Council and Committee (and its Sub-Committees) will be trained in all the management aspects by the expert team of the Consultant in collaboration with renowned local organizations, knowing the culture, the people and having a strong experience in the field of capacity building programs and education. Few organizations are present in Sagar and already active, especially in the fields of health, sanitation and agriculture (farming, poultry, husbandry…).

The selected local organization, hired on a contractor basis for the sub-components of the capacity building programs, are therefore trained on all the CBT aspects by the Consultant, with a strong emphasize on the set up of the governance model.

The beneficiaries will be:
- The NGOs active locally, selected by the consultant to accompany the projects components on the long run;
- Community members involved in the Museum compound activities (restaurant/café cooks and employees, shopkeepers, Tourism Information employees, maintenance employees…);
- Community members involved in activities outside the Museum (selected homestays, guides, fishermen, handicraft groups, cart drivers…);
• The CBTC on the management of the overall project components and the development of the community activities.

The objectives are to:
• work with the existing social structures and identify the resource persons;
• enable women, young and poor people to access activities and being sustainable in the long term;
  - promote the concept of CBT and tourism activities among local communities and villagers;
  - run and manage tourist services (food, accommodation and activities) for Sagar inhabitants, tourists and KMT visitors;
  - provide employment to the local people through rendering services to tourists.

Project components will include:
• Interviews and Focus Group Discussions with the leaders of the 5 villages concerned by the Ecotourism Development Plan (views on emerging challenges and implication on their livelihoods and conservation, selection of homestays);
• Capacity building of the NGOs;
• Capacity building and training of all the people involved in tourism activities, from qualified to operational:
  - Managing Directorate: projects management and supervision, role and duties;
  - Implementation Unit: administration, communication;
  - CBT Committees;
  - Homestays owners (after selection of 5 houses): guest management, hygiene…;
  - Museum employees: duties and maintenance;
  - Restaurant management: local cuisine, conservation, hygiene, day to day duties;
  - GSTO: administration, ITC, social networks, promotion…;
  - Guides: guest management, English, history of Sagar, population and religions, activities, Kapil Muni Temple, Sundarbans region, mangrove…;
  - Boat/fishermen: security and safety rules…;
  - Handicraft organizations: innovative products, gastronomy items (pickles and jams), fair trade branding, market and marketing, accountancy…;
  - Maintenance team: training on all the aspects of usual maintenance of commonly used products (electricity, bikes, repair…);
  - Creation of tourism trails, inside and around the villages, as well as on the beach.

**LANDSCAPE IMPROVEMENTS**

The proposed facilities and interventions has been spatially located appropriately bringing in compatible, sustainable and pleasant landscape established in tandem with other eco-tourism initiatives. For this the present large camp site in front of Kapil
Muni Temple has been re-visited taking in to consideration the scenic quality of the area, architectural necessity and requirements of sanitation and waste management especially during mela time. The proposed eco-tourism trail routes and proposed village home stay tourism plans have been integrated to be a part of this landscape development. The challenge to develop a sustainable landscape system attractive and elastic enough to accommodate demands of accommodation, sanitation and waste management for temporary population of several lakhs during mela time that reduces to a few thousands during rest of the year has been met.

**Tree planting**
Trees will be planted around the proposed facilities to beautify the sites and provide shades to tourist. This will include the eco-campsite, the museum, the bus stand, and main roads

**Removal of wirings**
As part of the beautification of the main camp site the electrical wiring which is disturbing the natural beauty of the area shall be removed replaced by underground wiring. Sockets shall be places at the base of the light poles allowing vendors, to plug their electrical units.

**OTHER FACILITIES**
Other facilities proposed by Sundarban Development Board such as Greenhouse, Centre for art and crafts and Handicrafts exhibition centre might be taken into consideration for future, long term development plans in case the embryonic facilities within the Museum will require larger spaces.

6. **Program implementation**

6.1 **Timetable of projects and activities**

Based on the program need and budget amount, the Consultant propose to implement the different proposal proposals and activities as listed in the table below:

<table>
<thead>
<tr>
<th>Projects / Activities in 2 years</th>
<th>Projects / Activities in 5 years</th>
<th>Projects / Activities in 10 years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cultural infrastructures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Museum and interpretation centre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Nat Mandir</td>
<td></td>
<td></td>
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<tr>
<td>- Dhala Arcade</td>
<td></td>
<td></td>
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<tr>
<td><strong>Basic infrastructures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Bus station</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Sanitation (623 toilet units, considering an user load of 117 per toilet unit)</td>
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<td></td>
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<tr>
<td>- Awareness campaign on Open Defecation Free</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Basic infrastructures</strong></td>
<td></td>
<td>To be estimated after monitoring the 5 previous years.</td>
</tr>
<tr>
<td>- Sanitation (200 additional toilet units)</td>
<td></td>
<td></td>
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<tr>
<td>Zone for Mela Ground</td>
<td></td>
<td></td>
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<tr>
<td>----------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Drainage system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Solid Waste Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Awareness campaign on solid waste management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projects / Activities in 2 years</td>
<td>Projects / Activities in 5 years</td>
<td>Projects / Activities in 10 years</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>----------------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td><strong>Tourism facilities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Ecotourism camp-site</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Home-stays</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Ganga Sagar Tourism Office and Community Shop</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Community managed restaurant &amp; Cafè</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Other facilities (Kid playground, open terraces and picnic tables on the beach)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Institutional development</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Community-Based Tourism Capacity-building and Training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Community-Based Tourism Governance Model</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Landscape improvements</strong></td>
<td><strong>Landscape improvements</strong></td>
<td><strong>Other Facilities</strong></td>
</tr>
<tr>
<td>- Tree planting</td>
<td>- Removal of wirings</td>
<td>- Greenhouse</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Centre for art and crafts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Handicrafts exhibition centre</td>
</tr>
</tbody>
</table>

The project proposals included in the group “Other Facilities” will be initially included in the museum (especially, the centre for art and crafts and the handicrafts exhibition centre). It is because, during the first implementation years, tourist flows are not important yet and these facilities will be organized at their embryonic status. However, they could have to be built separately in around 10 years, when tourist flows have increased dramatically, especially during not mela time.

### 6.2 Implementation arrangements

Construction of civil structures will commence upon the award of the work to a contractor following application of the World Bank’s standard procurement procedure after submission of the tender documents prepared by the Consultant and duly approved by the competent authority. Construction will be supervised by the selected Supervision Consultant Group following the standard procedure of the Government procedure of payment of works.
6.3 Operation and maintenance management plan

The O&M management will be in the hands of local people and service providers of the facilities. The elected representatives of various levels will head such management bodies.

For this reason, the Consultant consider important to conceptualize and develop the Operation and Maintenance Management Plan of the different infrastructures in collaboration with the Sagar Community Based Tourism Development Council, after its organization.

7. Estimated budget

7.1 Program implementation costs

Total budget for the implementation of the ecotourism development program is 346.6 million INR, as showed in the following table:

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>COSTS (in INR) (Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cultural infrastructures</strong></td>
<td>181,00</td>
</tr>
<tr>
<td>Museum and interpretation centre</td>
<td>90,00</td>
</tr>
<tr>
<td>Nat Mandir</td>
<td>17,00</td>
</tr>
<tr>
<td>Dhala Arcade</td>
<td>74,00</td>
</tr>
<tr>
<td><strong>Basic infrastructures</strong></td>
<td>95,80</td>
</tr>
<tr>
<td>Bus station</td>
<td>10,00</td>
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<tr>
<td>Sanitation</td>
<td>46,00</td>
</tr>
<tr>
<td>Awareness campaign on Open Defecation Free Zone for Mela Ground</td>
<td>0,50</td>
</tr>
<tr>
<td>Drainage system</td>
<td>35,00</td>
</tr>
<tr>
<td>Solid Waste Management</td>
<td>4,00</td>
</tr>
<tr>
<td>Awareness campaign on solid waste management</td>
<td>0,30</td>
</tr>
<tr>
<td><strong>Tourism facilities</strong></td>
<td>41,00</td>
</tr>
<tr>
<td>Ecotourism camp-site</td>
<td>40,00</td>
</tr>
<tr>
<td>Home-stays</td>
<td>1,00</td>
</tr>
<tr>
<td>Ganga Sagar Tourism Office and Community Shop</td>
<td>(Included in Museum and Interpretation Centre)</td>
</tr>
<tr>
<td>Community managed restaurant &amp; Café</td>
<td></td>
</tr>
<tr>
<td>Other facilities (Kid playground, open terraces and picnic tables on the beach)</td>
<td></td>
</tr>
<tr>
<td><strong>Institutional development</strong></td>
<td>23,80</td>
</tr>
<tr>
<td>Community-Based Tourism Capacity-building and Training</td>
<td>23,80</td>
</tr>
<tr>
<td>Community-Based Tourism Governance Model</td>
<td></td>
</tr>
</tbody>
</table>
### Final Report – Part A

#### 7.2 Cost of operation and maintenance

The basic philosophy regarding meeting the cost of O & M will be that the operators or managements of the facilities are to generate their own resources for operation and maintenance of the facilities. Government will neither be interfering with the management nor it will financially support the facilities’ operation and maintenance.

Please, see next paragraph 8.1 for more details about the long term sustainability approach that will be implemented by local stakeholders.

#### 8. Long term sustainability

##### 8.1 Expected social and economic impacts

The present ecotourism development model has been conceived to be long term sustainable. In particular, local population will manage directly the infrastructures and ecotourism activities identified during this assignment, allowing them to create new job opportunities and generate new incomes for local population.

Considering the new infrastructures and tourism activities that will be developed through the ecotourism development program, the revenues for local population will be made as follows:

- **Management of the infrastructures**: museum, parking, toilets and SWM
- **Tourism services and activities**: accommodation, food&beverage, tourism activities (such as, excursion for tourists, tourism guides, etc.), handicraft sales.

Out of the revenue made on the activities and products sold, and after payment of fair wages and fees to the members involved in activities according to a “Long
Term Sustainability Chart”, the benefits are saved on a **community fund** in order to:

- be re-invested into the community business to expand and diversify the products and activities (to buy land for expansion, to build new bungalows, to maintain trails across the villages, water pumps, bridges, roads, ponds...);
- Support community projects such as schools, health centers, bridges...;
- Set up villages micro finance establishments to assist especially women SHG and young entrepreneurs.

Benefit sharing is mediated through transparent and participatory mechanisms and processes. The “fair” wages and the percentage remaining for the community fund will be decided by the SCBT Council. The community fund shall be transparent and accountable, to reduce potential conflicts among community members.

**IMPORTANT:** During the implementation of Part-B, the Consultant will work hand by hand with local stakeholders and local communities to set-up the Community Fund and all regulation needed for the long term sustainability model.

Referring to the generation of new job opportunities for local population, it is expected that the project will generate around **750 new jobs during mela time** as showed by table#1:
<table>
<thead>
<tr>
<th>Activity</th>
<th>Job creation</th>
<th>Description</th>
</tr>
</thead>
</table>
| Museum *      | 19           | This personnel for tourism services provided in the museum.  
|               |              | a) Director - Could be appointed from the associated institutions and be non-resident, just involved in producing the exhibitions.  
|               |              | b) Curators - 3 No. (also could be appointed from associated institutions and be non-resident, just involved in producing the exhibitions)  
|               |              | c) Guards - 4 No. (2 day and 2 night)  
|               |              | d) Ticket office/book shop operators - 2 No.  
|               |              | e) Cleaners - 2 No.  
|               |              | f) Cooks - 2 No.  
|               |              | g) Servers for tables - 4 No.  
|               |              | Totals = Museum Staff = 4; Local Staff = 15  
| Dalha Arcade *| 5            | It includes one Director and four assistances responsible for operation and maintenance of the infrastructure.  
| Parking *     | 5            | It includes one Director and four assistances responsible for operation and maintenance of the infrastructure.  
| Sanitation / Toilets * | 475 + 50 = 525 | It includes 475 staff managing the toilets and 50 people for green police. These people is considered during mela time. After the mela time, it is estimated around 20-30 permanent staffs for maintenance of the permanent toilets created under this program.  
| SWM *         | 15           | It includes the following people:  
|               |              | - Responsible for SWM operations – n.1  
|               |              | - Responsible for Composting Plant – n.2  
|               |              | - Responsible for public awareness strategy – n.1  
|               |              | - Responsible for waste reduction and recycling - n.1  
|               |              | - Refuse workers – n.6  
|               |              | - Waste pickers – n.4  
| Eco camping * | 15           | It includes one Director and 14 assistances responsible for operation and maintenance of the infrastructure.  
| Homestay      | 20           | It includes an average of four people working for each homestay  
| Tourism activities | 150       | This is the estimation of local population that will be involved in the new tourism services that will be organized by local population: tourist guides, local transport, fishermen, handicraft, etc.  

* It has to be considered as temporary employment. Its pick is during mela time, while they will be reduced during not mela times.

8.2 Environmental impacts

It is expected that the activities related to the construction of the sanitation system, the solid waste infrastructures, and the drainage system will enhance sensitively the present environmental quality of the project area.
Referring to the **water contamination**, based on a study\(^1\) on the quality condition of the water in the creek in the project area before and after Ganga Sagar Mela, “the comparative study of environmental parameters indicated a degradation of quality of environment basically by human waste, and it showed a persistent nature for at least one to two months……As expected, the worst affected parameter of the environmental quality was found to be the bacterial count of the surface water followed by the hardness and dissolved Oxygen. While the enhancement of fecal coliform count were between 1.5 to 34 times depending upon the specific site locations during GSM period, the depletion of dissolved oxygen were at most 7 per cent, with up to 80 per cent increase in hardness. Comparatively higher degradation of seawater quality in respect to the organic pollution has been reported at the Eastern side of Sagar beach at Dhablat, where the Sagar canal meets the Bay of Bengal. The maximum organic pollution was found at Canal near Jhauban, which is nearest to the temporary toilet complex and also an area of fish drying”. Implementation of the present program, with the construction of additional basic infrastructure facilities (like sanitation, solid waste management facilities) during Ganga Sagar Mela, and the training of local people and awareness campaigns addressed to local population and pilgrims/tourists, will reduce sensitively the present contamination level of the water, putting them under the stipulated standard levels for the human health.

Referring to the **solid waste management**, as stated by the analysis (see Position Paper on Solid Waste Management), there are little data about the present situation. However, the Consultant has found out that solid waste is simply buried in pits dug in the project area. These pits are excavated during the year from animals (or people), spreading the waste on the whole project area. The solid waste infrastructure that will be built with the present project and the information and awareness activities addressed to local population and pilgrims/tourists will eliminate the present problems.

Finally, referring to the **drainage system**, as detected by the topographical analysis the present tide level during monsoon season is around 5.5m above mean sea level, covering the major part of the area in the project area. The solution proposed by the Consultant aims to eliminate the problem in the Southern portion of mela ground, including the camp-site and the high activity zones of Ganga Sagar Mela.

### 8.3 Mitigation and management measures

All project proposal and activities of the ecotourism development plan will improve the present situation of the project area, without affecting local population.

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\(^1\) “Impact of Gangasagar Mela on Sustainability of Sagar Island, West Bengal, India” - International Journal of Research in Chemistry and Environment Vol. 2 Issue 1 January 2012(140-144)
There is only one family which has recently built their house made in mud and reeds/wood at the corner of the land identified by the Consultant for the construction of the museum / interpretation center. It has been constructed without authorization during the last two months. After consultations with the Consultant, local Government already started negotiations with this family with the purpose to remove the house from the museum area.

9. Conclusions and recommendations

Sagar Island is at its first stage of tourism development circle, and it is possible to say that “the Island is starting its tourism development, slowly”.

Globally seen, Sagar Island is an appreciated religious destination able to attract tens of thousands of tourists / pilgrims within the year. This tourism is mainly concentrated during a very short time in January of each year (Ganga Sagar Mela), while during the rest of the year the flows are very limited, with the exception of other two minor melas and other local and State events.

This Ecotourism Development Plan shall be considered as an opportunity for Sagar Island to develop local economy through tourism, especially considering its integrated approach. For this reason, some suggestions that should be taken into consideration during the implementation of the Plan, are listed as follows:

- **Involve as much as possible local NGOs and state universities for capacity building and training activities.**
  As stated in the PPs analysis, local stakeholders and population are not used to the tourism industry yet. Local economy is mainly based on traditional agriculture and fishing, while there is a general lack of skills and competences on how the tourism product is structured and the tourism sector is organized. Training and technical assistance are two very important activities to be addressed to local population with the aim to involve them into the tourism sector. To do this, it will be very important to collaborate with local NGOs, already working in the project area, and state universities. It is because they already know the local stakeholders, making easier their involvement in the next project activities (organization of the Community-based Tourism Council, Committees, etc.)

- **Establish the Community Based Tourism Council and Committees as important tools where public and private sectors and local communities works together for promoting economic development through tourism.**
  There is growing consensus that successful tourism development entails integrating the participation of local businesses, tourists, local governments, and local residents. Maximum visitor enjoyment and local economic benefit can only be attained by a coordinated focus that brings local issues and concerns to the attention of regional and state decision-makers. The structural organization of the Ecotourism Development Model has been conceived to
stimulate the collaboration of all key actors of the project area for tourism development. For this purpose, permanent information and communication with all key actors will make the process transparent and so accessible to all stakeholders, without preferences or discriminations.

- **More appropriate roles for government as a facilitator rather than as an actor in the tourism industry.**
  Very often, the most important role played by local governments in tourism development is not only referred to its financial funds availability, but also to its role as legislation maker. In Sagar Island, local government will be responsible to develop the present legislation framework in a way to help the development of new tourism services, mainly managed by micro enterprises. The Consultant will dedicate specific training for public officers with the purpose to develop skills and competences of the public sector on this issue.
Annex 1 - Monitoring and evaluation arrangements

A) SANITATION

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Benchmark standard</th>
<th>Monitoring frequency</th>
<th>Method of monitoring</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Open defecation incidences</td>
<td>0 incidences</td>
<td>Hourly on each day</td>
<td>Visual inspection</td>
<td>Public Health Engineering Directorate (PHED), Mela authority (during mela) and green police/volunteers, representatives of Sagar Island</td>
</tr>
<tr>
<td>2. Adequacy of toilet units (temporary, mobile and permanent)</td>
<td>Provision of 1 toilet facility per 100 pilgrims during mela / Provision of 25 pilgrims per toilet after mela</td>
<td>Daily during mela Monthly after mela</td>
<td>counting by the Toilet guards/gate keepers, money earned from the toilets after mela</td>
<td>Toilet block supervisors during mela, representatives of Sagar Community based tourism council after mela</td>
</tr>
<tr>
<td>3. Quality of creek and sea water</td>
<td>As per bathing water standard of Govt of India (pH: 6.5-8.5, DO: &gt; 5 mg/l, BOD$_{5,20}$ &lt; 3 mg/l, Fecal coliform) &lt; 2500 MPN/100 ml</td>
<td>2 times a day during mela and once a week after mela at specified locations</td>
<td>Sampling locations: i) Behind Kapil Muni Temple, ii) where the creek meets the sea near the Casuarinas Plantation, iii) location where proposed flap gates are set up 12-hour composed samples are to be prepared by taking sample from whole width of the creek</td>
<td>PHED</td>
</tr>
<tr>
<td>4. Quality of treated Effluent discharged from the toilet</td>
<td>Standard set by MoEF for discharge to Inland surface water (BOD$_{5,20}$: &lt;= 20 mg/l TSS.: &lt;= 30 mg/l Fecal Coliform: &lt;10000 MPN/100 ml)</td>
<td>Once a day from each toilet block during mela and once a week after mela</td>
<td>Sample to be collected at the outlet of the toilet blocks Laboratory analysis of relevant parameters based on MOEF guideline</td>
<td>PHED with assistance from local toilet operators during mela Representative of Sagar Community based tourism council in collaboration with PHED</td>
</tr>
</tbody>
</table>
### B) SOLID AND WASTE MANAGEMENT

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Benchmark standard</th>
<th>Monitoring frequency</th>
<th>Method of monitoring</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Waste is collected in all mela ground avoiding littering of roads and open spaces</td>
<td>100% of waste is collected</td>
<td>Twice a day (morning and afternoon)</td>
<td>Visual inspection</td>
<td>PHED</td>
</tr>
<tr>
<td>2. Sorting of waste implemented at SWM facilities</td>
<td>100% of waste is segregated</td>
<td>Twice a day (morning and afternoon)</td>
<td>Visual inspection</td>
<td>PHED</td>
</tr>
<tr>
<td>3. Organic waste delivered and processed in the composting plant</td>
<td>100% of organic waste is composted</td>
<td>Daily</td>
<td>Visual inspection</td>
<td>PHED</td>
</tr>
<tr>
<td>4. Burning of waste eliminated</td>
<td>Burning of waste is eliminated to stop air nuisance and pollution</td>
<td>Twice a day (morning and afternoon)</td>
<td>Visual inspection</td>
<td>PHED</td>
</tr>
<tr>
<td>5. Recyclables sold in the local market</td>
<td>100% of recyclables waste is recovered</td>
<td>After the melas</td>
<td>Visual inspection</td>
<td>Local community</td>
</tr>
<tr>
<td>6. Residual waste is collected by covered vehicles and disposed of in the landfill</td>
<td>100% of non-recoverable waste is disposed in a landfill</td>
<td>After the melas</td>
<td>Visual inspection and check of landfill receipts</td>
<td>PHED</td>
</tr>
<tr>
<td>7. Disposal of waste into pits dug into the beach is completely eliminated</td>
<td>0 incidence</td>
<td>Twice a day (morning and afternoon)</td>
<td>Visual inspection</td>
<td>PHED</td>
</tr>
<tr>
<td>8. Quality of compost compliant to standard of composting specified Municipal Solid Waste (Management and Handling) Rules, 2000</td>
<td>As per standard specified in schedule IV of Municipal Solid Waste (Management and Handling) Rules, 2000</td>
<td>After composting process is completed</td>
<td>Laboratory analysis of relevant parameters</td>
<td>PHED</td>
</tr>
<tr>
<td>9. Satisfaction of the tourists regarding beach maintenance</td>
<td>At least 80% of tourists is satisfied about maintenance of the beach</td>
<td>Once during mela time and twice during the year</td>
<td>Direct interviews with tourists / visitors</td>
<td>Sagar Community Based Tourism Council</td>
</tr>
</tbody>
</table>
## C) TOURISM FACILITIES

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Benchmark standard</th>
<th>Monitoring frequency</th>
<th>Method of monitoring</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Shelters for night stay</td>
<td>No person sleeping in the open</td>
<td>Daily at night time</td>
<td>Visual inspection</td>
<td>Police department</td>
</tr>
<tr>
<td>2. Availability of quality food</td>
<td>Clean kitchen and dining area and no stale food</td>
<td>Twice daily</td>
<td>Visual inspection and tasting of sampling</td>
<td>Block food inspector</td>
</tr>
<tr>
<td>3. Incidence of gastro-enteritis disease</td>
<td>0 incidence</td>
<td>Daily</td>
<td>Inspection of records of health camps</td>
<td>Block health inspectors</td>
</tr>
<tr>
<td>4. Availability of means of road transport and river crossing</td>
<td>No assembly of more than 10 people waiting for road transport at any time and no assembly of more than 50 people at the ferry ghat</td>
<td>Hourly</td>
<td>Visual estimation</td>
<td>Transport department</td>
</tr>
<tr>
<td>5. Occupancy rate of the eco camp-site</td>
<td>100% during Mela time and at least 40% during no mela time (tourism season)</td>
<td>Monthly</td>
<td>Number of tourists / visitors registered by the eco camp-site</td>
<td>Sagar Community Based Tourism Council</td>
</tr>
<tr>
<td>6. Number of tourists / pilgrims visiting the area</td>
<td>At least 7% annual increment during Mela and around 25% within the year</td>
<td>Once a year</td>
<td>Cross-data of:</td>
<td>Transport department</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- number of passengers of the ferry-boat</td>
<td>Sagar Community Based Tourism Council</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- number of visitors to the museum and the Temple</td>
<td></td>
</tr>
<tr>
<td>7. Number of tourists / pilgrims visiting the museum</td>
<td>At least 40,000 visitors during mela time and around 300,000 visitors within the year (after 5 years of project implementation)</td>
<td>Once each three months</td>
<td>- number of tickets sold</td>
<td>Sagar Community Based Tourism Council</td>
</tr>
<tr>
<td>Indicator</td>
<td>Benchmark standard</td>
<td>Monitoring frequency</td>
<td>Method of monitoring</td>
<td>Responsibility</td>
</tr>
<tr>
<td>------------------------------------------------</td>
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<td>---------------------------------------------------</td>
</tr>
<tr>
<td>8. Shops open all year round</td>
<td>At least 70 permanent shops open all year round</td>
<td>Once a year</td>
<td>- Number of authorizations - Visual inspection</td>
<td>Sagar Community Based Tourism Council</td>
</tr>
<tr>
<td>9. Increment of incomes generated by shops in Ganga Sagar</td>
<td>At least 30% after one year of project finalization</td>
<td>Once a year</td>
<td>- Personal interviews with shop owners</td>
<td>Sagar Community Based Tourism Council</td>
</tr>
<tr>
<td>10. Number of regional TTOOs proposing the destination</td>
<td>At least 5 regional TTOOs promoting and selling tourism in the project area</td>
<td>Once a year</td>
<td>Interviews with TT.OOs</td>
<td>Sagar Community Based Tourism Council</td>
</tr>
<tr>
<td>11. Expenditure of tourists</td>
<td>At least 30% more after one year of project finalization</td>
<td>Once during mela time</td>
<td>Interviews with tourists</td>
<td>Sagar Community Based Tourism Council</td>
</tr>
</tbody>
</table>
## D) COMMUNITY BASED DEVELOPMENT

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Benchmark standard</th>
<th>Monitoring frequency</th>
<th>Method of monitoring</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Number of local people trained about tourism development and its</td>
<td>At least 200 local people before finalization of the project</td>
<td>Once each six months</td>
<td>Participant registration to the training courses</td>
<td>Sagar Community Based Tourism Council</td>
</tr>
<tr>
<td>opportunities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. % of local population sensitized about ecotourism development</td>
<td>At least 50% of total local population in the project area</td>
<td>Once a year</td>
<td>Direct interviews with local population</td>
<td>Sagar Community Based Tourism Council</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Number of local people trained</td>
<td></td>
</tr>
<tr>
<td>3. Number of local NGOs implementing training and awareness activities</td>
<td>At least 3 local NGOs after project finalization</td>
<td>Once a year</td>
<td>Direct interviews with local NGOs</td>
<td>Sagar Community Based Tourism Council</td>
</tr>
<tr>
<td>related to CTB development</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. % of Scholars among the visitors of the Museum</td>
<td>At least 10% of total visitors</td>
<td>Once a year</td>
<td>Tickets sold registered by the museum</td>
<td>Sagar Community Based Tourism Council</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Number of permanent jobs created by the CBT activities</td>
<td>At least 200 permanent jobs created after project finalization</td>
<td>Once a year</td>
<td>Direct interviews with local entrepreneurs</td>
<td>Sagar Community Based Tourism Council</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. % of women, young and disabled employed in CBT activities</td>
<td>At least 40% of total employees</td>
<td>Once a year</td>
<td>Direct interviews with local entrepreneurs</td>
<td>Sagar Community Based Tourism Council</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. % of tourists vs pilgrims</td>
<td>At least 40% of visitors are tourists</td>
<td>Once each three months</td>
<td>Direct interviews with tourists and visitors</td>
<td>Sagar Community Based Tourism Council</td>
</tr>
</tbody>
</table>
Annex 2 - Operation and Maintenance

The present Annex includes the operation and Maintenance arrangements about Sanitation, SWM, main infrastructures and the tourism facilities. For the Museum, due to its importance, the Consultant proposes to define the O&M in collaboration with the Sagar Community Based Tourism Council, after its organization (during the implementation of Part-C of the present assignment).

1. Sanitation

O&M During the mela:

The maintenance of the toilet units will mainly involve cleaning at regular interval and sprinkling of bleaching powder. Approximately gives INR 12 \(^1\) is required for each toilet unit, which include cost of daily cleaning including costs of bleaching powder, lime powder, broom, mug, bucket, detergent powder, phenyl. So the cost for 650 units (if provided) will be around INR 0.055 million during the seven days of mela.

It is suggested that except the 130 permanent pay and use toilet units, all other toilet units are operated free of cost during the mela.

Man-power requirement

Considering a toilet block of 10 toilet units, the manpower requirement during mela will be

i) 2 gate keepers cum user manager for two shifts (they will double up as money collector in case of pay and use toilets. The gate keepers will also be trained for solving small plumbing problems and other fixing works.

ii) 2 janitors for two shifts (each shift will be for 12 hours). The janitors will also act as a part of the observer who will keep and watch within an area of 100 m of the toilet block and in case anyone commits open defecation or urination in this area, they will ask them to use the toilet. If they do not oblige, it will be brought to the notice of the green police (see later).

For four toilet blocks of 10 units there will be one supervisor, his main responsibility will be to ensure the cleanliness of the units by supervising the janitor, arranging supply of materials for maintenance, coordination of changing of shifts and keeping eye on the ODF offenders. The gate keepers and janitors of the female toilet blocks will be all female. For four blocks two reserve janitors may be kept (one male and one female). Thus a gang of 19 people will look after four toilet blocks during the mela. In case additional 75 toilet block and 25 MTVs

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\(^1\) Kumbh Mela 2010 for construction of temporary toilet with Superstructure, As different places of Kumbh Mela, 2010, Sulabh International Social Service Organisation.. Dehradun, 2010
(in say detailed break up above) are installed during the mela, the number of persons required for operation and maintenance will be around 475. However, in case of mobile toilets, the numbers may be reduced slightly. Considering average salary as 1000 INR during the mela, the total cost for the O&M people will be around 0.48 million INR.

For the maintenance of the toilets, a committee may be formed with representatives from Ganga Sagar GP, the Mela committee, the PHE department, the South 24 Pargana Jilla Parsihad and the self help groups in the Sagar Island. They will recruit the persons and if required provide prior training.

**O&M During the Normal Period:**

Apart from typical maintenance of the cleanliness of the toilet units, main maintenance issue during the normal period is:

i) **Maintenance of the sub structure of the semi-permanent toilet blocks:** The main concern are the maintenance of squatting plates and associated plumbing units, which will be left at site and will be covered by pre cast concrete block. The walls, roof and the doors of the temporary toilets will be dismantled and stored suitably for future use.

ii) **One or two toilet units in any toilet block 10 units will be operated throughout the year.**

iii) **Handling of septage from the existing and new septic tank units (if provided).** Generally septage form the septic tank is co treated with the sewage sludge of a sewage treatment plant. The closest STP near the Sagar island is the South Suburban East STP in the Kolkata Municipality area, at a distance of around 110 km. So the septage is to be handled in the island. Considering high user load on the septic tank units during the mela, the tanks need to be cleaned every year before starting of the mela. It is suggested that one cesspool cleaning tank is purchased from the fund available for the ICZM project. A tank of capacity 3000 litre, can clean around 1 septic tank per day (capacity around 10 m$^3$). So the existing septic tanks (around 60 in the mela area for the toilets blocks exclusively used for mela) can be cleaned in 2-3 months time. During remaining period of the year, it can be used for the buildings in the mela.

In absence of any septage treatment system, the digester tanks can be fed with the septage collected from septic tanks. That will reduce the distance to be travelled by the tanks every day and the cost of fuel consumption can be reduced.

During the normal period one gate keeper for each toilet block and one janitor for 10 toilet units will be sufficient.
2. **Solid Waste Management**

Operation of the composting plant include the following 9 steps:

- Step 1: Sorting
- Step 2: Mixing
- Step 3: Piling the Waste
- Step 4: Turning of Windrows
- Step 5: Temperature Control
- Step 6: Moisture Control
- Step 7: Maturing / Curing
- Step 8: Screening
- Step 9: Storage and Bagging

Operational safety and health protection for workers should be the priority concern. Workers are obliged to wear protective gear like uniforms, gloves and boots at any stage when they are handling waste and compost.

**Step 1: Sorting**

Compost quality is mainly determined by the quality of the input material. Hence, the sorting of the waste plays a vital role. Substances which are not biodegradable need to be separated from the biodegradable fraction. Sorting is especially crucial with regard to hazardous materials. They must be removed before the composting piles are formed otherwise they will contaminate the entire pile and severely compromise the final compost quality.

As soon as the mixed waste arrives at the composting site, it is separated manually into biodegradable material, recyclables, and rejects. Manual sorting will be done on the ground with a small rake as normally done in West Bengal. Workers must wear protective gloves, boots and masks as they are in close contact with the waste.

Rejets and recyclables are sorted into different buckets and/or baskets. Recyclables are stored for sale in a shed. Rejects are temporarily stored on-site before being transported to the landfill whereas the biodegradable waste fraction is further processed inside the plant. After having finished the sorting process, the
Step 2: Mixing

The ratio of carbon (C) to nitrogen (N) - also called C/N ratio is very important for the biological degradation of organic waste. Both C and N are feedstock for micro-organisms responsible for the degradation of the organic matter. While carbon is important for the cell proliferation, nitrogen is the nutrient source. Generally one can classify “green” materials (Cow/chicken manure, vegetable and fruit waste, grass cutting, etc.) as being high in nitrogen and “brown” materials (Leaves, twigs/grances, wood chips, saw dust) as high in carbon. Household waste can be considered being already a combination of green and brown waste. The input material should have a carbon/nitrogen ratio of 25:1 to 40:1 to allow most rapid and efficient degradation of the organic material.

The wide range of the C/N ratio already indicates that a certain variation of waste components is possible. It is recommended to keep incoming “brown” waste separate from “green” waste and to add it later depending on the composition of the waste produced during the melas. For a start, these “green” materials and “brown” materials are mixed in equal volumes. This ratio may need to be adjusted if the composting process is not satisfying. For instance, if the waste is very wet with little structure (e.g. kitchen or restaurant waste) the fraction of “brown” materials has to be increased to correct the C:N ratio, but also to reduce the moisture content and to encourage the movement of air.

It will take some time to learn the specifics of waste produced during the melas. Over time, the plant manager will get a keen sense of how to mix the different incoming waste types and when to add wood chips or animal manure.

Step 3: Piling the Waste on aerators

The sorted organic waste is loosely heaped onto bamboo aerators and formed into long piles (windrows) as shown in the pictures below.
Figure 2, Windrows piled on bamboo aerators.

The composting piles have a width of 1.6 m a length of 2-3 m and a maximum height of 1.6 m. The waste of 2 to 3 days can thus be accumulated on one aerator. It is not recommended to take more than three days to build a windrow because this would lead to inhomogeneous decomposition. A windrow should have volume of approximately 5 m$^3$ and hold about 4 tons of organic waste. This windrow design allows sufficient oxygen supply and optimal heat generation, maximising the decomposition rate of the waste. The aerators and the restricted height and width ensure sufficient oxygen supply and prevent the pile from overheating. (Heat is developed in a compost pile that has the right conditions of C:N ratio, moisture content and air supply because huge numbers of bacteria are actively feeding on the waste.

**Step 4: Turning of Windrows**

One of the important factors during the composting process is to ensure sufficient supply of air. Within a few days, aerobic micro-organisms exponentially proliferate, consuming an enormous amount of oxygen. A lack of oxygen likely favors the growth of anaerobic organisms which cause unpleasant odors. Furthermore, anaerobic conditions slow down the degradation process resulting in a longer composting period. Thus, attention must be given to ensuring an adequate air supply.

The bamboo aerators already increase the oxygen supply by passive aeration through the bottom. Turning the material frequently as shown in the picture aside provides additional oxygen to the system as the waste comes into contact with fresh air.
The system described here is based on manual turning. The composted material is removed from the aerators with rakes, taking care not to damage the aerators. The presence of steam is a good indicator of the effectiveness of the composting process. Initially, the material should be turned 2 to 3 times per week as the composting process is very active with a high oxygen demand and reaching temperatures up to 70°C. When the temperature starts to drop, the pile still needs to be turned every 10 days. In total, 5 to 8 turnings within 40 days are necessary. Turning of waste will have the following effects:

- It helps to keep the pile temperature within the optimum range of 60–65°C. If the temperature becomes too high, the material remains spread out on the floor for about fifteen minutes during the turning process before it is replied (see Step 5 below, temperature control).
- Turning ensures that all biodegradable material gets in contact with air, thus avoiding “anaerobic zones” causing unpleasant odour.
- Water losses can better be compensated for during turning, ensuring a more even distribution of the added water.
- Turning allows the less composted outer layer of the windrow more chance of getting inside the pile, ensuring a better hygienisation (killing of fly eggs and pathogenic microorganisms) of the final compost. The waste should be thoroughly mixed before it is re-piled.
- The mechanical stress on the material favours a high degree of homogenisation of the entire waste material, leading to an accelerated process and an end product with a finer structure.

Windrow Composting Method

Waste is piled onto a triangular wooden rack allowing a passive aeration of the compost pile. The additional aeration from the bottom of the pile allows microorganisms to decompose the organic waste efficiently through a better oxygen supply and improved temperature control. Within 24 hours, the microorganisms within the waste start to multiply and generate heat. Pile temperature increases to 55–65°C, which is optimum for aerobic composting. To enable the microorganisms to obtain sufficient oxygen, the pile is additionally aerated by turning the waste from time to time (approximately once a week). High temperature leads to water losses through evaporation, so additional water must usually be added with each turning. After 40 days of composting, the temperature has decreased, indicating a slowing down of the process. As less oxygen is demanded, the raw compost can be removed from the aerator and piled again for the maturation phase without a central aerator. For another 15 days, mesophilic microorganisms further stabilise the compost leading to the final mature compost product.

Step 5: Temperature Control

Provided that the C:N ratio, and the aeration and the moisture content are all within the optimal range, the microorganisms multiply exponentially. This microbiological activity results in a temperature increase to 65–70°C within 1 to 2 days. Temperatures above 70°C need to be avoided as they are too high for even thermophilic bacteria and so inhibit the microbiological activity. The following pictures show how temperature varies during the comporting period.
Temperatures above 80°C are lethal to most soil microorganisms and the process comes to a halt. Although composting will occur at temperatures below 65°C, a temperature of around 65°C favours rapid composting and ensures the destruction of weed seeds, insect larvae, and potential plant or human pathogens. Therefore, it is preferable for the temperature of the composting pile to stay at around 65°C for at least three days. After the first week, the temperature gradually decreases and the decomposition process slows down. The process moves into the mesophilic phase (45 - 50°C) and other microorganisms take over the transformation until the waste material is transformed into fresh compost.

**How to measure the temperature:**

- Use an alcohol thermometer and attach a string to the top of the thermometer. (Do not use mercury thermometers as the mercury can pollute the entire compost pile if they break during measurement. Mercury belongs to the group of heavy metals and is classified as a hazardous substance.) If available, a digital thermometer with a stick probe is preferable.
- If you use an alcohol thermometer for measurement, firstly push a hole into the compost down to the required depth within the pile using a broom handle or an appropriate stick.
- Then carefully lower the thermometer into the hole with the string
- Leave the thermometer in the compost for about 1 minute then pull the thermometer out by the string and immediately record the temperature.
- Record the temperature trends twice a day at three points within the pile – the top, middle and bottom of the pile.
- Record the ambient air temperature as well.
Figure 5, Temperature curve showing the two composting phases: thermophilic phase with frequent turning, maturation (mesophilic) phase with occasional turning
**Step 6: Moisture Control**

Microbes take up nutrients only as dissolved ions in a film of water. Thus, the moisture content of the waste plays an important role. To ensure rapid decomposition, maintain the moisture content in the composting piles at a level of 40 to 60%. Ideally, water is only added during turning as the material is spread out on the floor. The picture aside shows the watering of a freshly made windrow in which the water content in the outer layer was too low.

Figure 7 describes a quick test for moisture measurement. Take a handful of compost and squeeze it hard. If only a few drops of water appear the moisture content is in the optimal range. If no drops emerge the moisture content is below 40%, indicating that the nutrient provision is hampered. Consequently, the composting process slows down. Often, the temperature of the waste pile decreases though the process is not finished, because the water content is too low. Adding water raises the temperature of the composting pile and the decomposition process continues. If the moisture content is too high, the pile tends to become anaerobic and produces unpleasant odors.

The following steps shall be followed:

- Wear protective gloves when testing the moisture (squeeze test) for hygienic reasons and in case there are sharp materials in the compost.
- Add water during turning with a sprinkler until optimal moisture content is reached.
- In some cases compost produce excessive water (leachate) in the beginning of the process. This leachate can be collected and reused for watering the next pile.
**Step 7: Maturing / Curing**

After about 40 days, the material in the piles has a colour like soil and the pile temperature has fallen below 50°C. This indicates that the process has entered the curing or maturing phase. Other micro-organisms and small insects like caterpillars and bugs re-colonise the still immature compost. Slowly, they further break down the more complex organic materials like cellulose while producing substances somewhat like topsoil. Additional three weeks are necessary to ensure that the compost is mature and suitable for direct application to plants. During this phase the compost needs less oxygen and less water. The temperature constantly goes down to the ambient temperature.

The following steps shall be followed:

- Remove the fresh compost from the aerator
- Pile the fresh compost in the maturing area. The piles can be moved closer together and piled higher (to a maximum height of 1.5 m) to save space.
- Turning is no longer necessary.
- Only little watering is necessary, if the piles are very dry.
- During the rainy season, keep the compost under a roof to prevent it from getting soaked. Rain might leach valuable nutrients from the compost.
- Continue daily temperature monitoring until the compost is at the ambient temperature. If the temperature of the compost rises when water is added to it, the compost is not mature and needs additional days for final curing.
- The presence of white or grey colour indicates the presence of fungi, which are important micro-organisms for the composting process. Their appearance also indicates that the pile is still in the mesophilic phase.
- Mature compost appears dark brown, has an earthy smell and a crumbly texture.

**Step 8: Screening**

The mature compost has a rather coarse texture. The particle size of the compost strongly depends on the size and the composition of the input material and the turning frequency. In many cases finer compost is required and so the compost must be screened. The screening is done by using a flat frame sieve. The frame sieve (a rectangular wooden frame with a wire mesh stretched across it) is propped up in a sloping position. The raw compost is thrown onto the sieve and rubbed through the mesh.

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**Figure 8, Maturing of compost**

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There are four different grades of compost, which may be referred to as coarse, medium, fine and superfine. Screens with four centimetre square openings are used for the medium grade of compost and a one centimeter mesh is used for fine grade of compost. In this plant fine grade compost will be produced.

Compost should be virtually free of all foreign matter such as pieces of plastic or broken glass. Small inorganic particles, which were missed during the initial sorting, should be sent to the disposal site together with other residues. Coarse organic material which has not been completely composted normally remains in the screening residues. This material is a valuable carbon source and should be mixed with fresh incoming waste. It already contains micro-organisms that can accelerate the decomposition of the incoming material.

**Step 9: Storage and Bagging**
If compost reheats above ambient temperature after the screening process it is still not completely mature. In this case sprinkle little water and let the compost rest for another week. The compost should be relatively dry when it leaves the plant to avoid transporting large amounts of water with the compost (moisture content < 40%). Store the mature and screened compost in a dry and covered place as rainwater would leach out valuable nutrients.

Compost will be produced for use in the mela ground and ganga sagar area and therefore bagging should not be necessary. However, in case the production is higher than the local demand it can be bagged and sold to clients out of Ganga Sagar. In this case the following recommendations shall be followed:

- Check the temperature again before you start bagging it
- Pack the compost into bags only just before it is to be sold.
- The bags should be waterproof but permeable to air as compost is still a “living” material requiring air. Woven polypropylene bags proofed to be very suitable for compost.
- Compost is usually sold in bulk or in bags of different sizes (e.g. 5 kg, 10 kg, 40 kg). Some bulk purchasers may like to use a coarser grade of compost if the price is attractive.
- Label the bags. The label should indicate the name and origin of the product, the weight and the date of packing.
- The storage of compost should not be for longer than two years as the nutrient value of the product and the organic matter content slowly decrease over time.
Reference
Decentralised Composting for Cities of Low- and Middle-Income Countries - A Users’ Manual, Published by United Nations ESCAP (Economic and Social Commission for Asia and the Pacific).

3. Main infrastructures

3.1 Dala Arcade

The facility will be operated and maintained by an elected Committee of a Society to be formed comprising the shop-allottees. The O & M schedule will be standardised by the Committee through consensus. The cost of implementation of the O & M schedule will be met by yearly contribution from the stall-allottees. The Committee will employ a local Watch & Ward agency to ensure security, a Cleaning agency for daily cleaning & washing of the facility and an agency to maintain the landscape around the facility. Special contribution will be collected if routine repair of the facility is required in any particular year.

3.2 Nat Mandir

Nat Mandir is nothing but a large covered open hall where groups of pilgrims will take rest before and after visiting the Kapil Muni temple. Being traditionally a part of the temple complex, O & M management of the Nat Mandir will rest with the Temple authority.

3.3 Bus Station

In a rural area of West Bengal, management of operation and maintenance of Bus station and other public facilities rests with the Gram Panchayet. As such management of operation and maintenance of the refurbished bus station will be the responsibility of the Gangasagar Gram Panchayet.

4. Tourism facilities

4.1 CBT Campsite

Campsite team
- 1 general manager: in charge of the whole campsite activity
- 2 reception staff: in charge of the logistics, bookings…
- 2 security staff: in charge of gate security (night and day) and safety on site
- 2 environment staff: in charge of gardening, campsite cleaning, hygiene, waste and bins management…
- 4 housekeepers (in charge of tents, huts and toilet blocks cleaning)
- 2 laundry staff (for cleaning bed sheets, pillows, towels…)
- 2 cooking staff from a women SHG (working on a rotation basis, in charge of the whole campsite restaurant, mainly used for clients’ breakfast; preparing breakfast and occasionally meals)

O&M during the Normal Period
The campsite is open all year round, except during heavy monsoon time, when there is no tourism activity on the island. The huts and platforms should not suffer from floods and the wooden huts are always available for rent; the tents are set up on the wooden platforms depending on the bookings. During the monsoon, all the tents are maintained and stored.

The maintenance of the sanitary blocks (which are mobile), is under the responsibility of the sanitation management system (see paragraph 1 of the present annex), while their everyday management is done by the housekeepers.

The accommodation is booked directly through the CBT Internet website, through tour operators and directly on arrival if availability. Bed sheets and towel are rented at the reception.

Security is ensured by staff at the gate and in the campsite; they are in charge of all the safety/security aspects of the site.

The O&M during the Mela
The 20 tents are set up and available for renting and the whole campsite hosts visitors. Private tents can exceptionally be set up on the ground. As the campsite is wifi connected, it could be proposed for particular purpose or for a specific category of clients (journalists’ basecamp, VIP and officials’ place…).

The restaurant proposes food to the guests (lunch and dinner). In any case, the guests are PAYING guests (official ones and others), and the rate during this period is more expensive than the rest of the year.

4.2 Restaurant & Café
Self-managed by an existing SHG, it works in accordance with the SCBT Committee rules.
The day to day management is done on a rotation basis, by women who cook their own preferences following a set menu (every day of the week, a different type of meal for instance). The Restaurant & Café and are open according to the Museum. From food earnings, 5% is paid to the community and 5% to the SHG.

4.3 The GSTO & Shop
- Open all year round, it proposes bicycles rental, maps, information, activities booking.
• 6 staff, on a rotational basis, who perceives monthly wages, paid from the Museum’s entrance fees and, bike rental and if necessary, the community fund (which includes the Tourism fund, financing wages).
• 15% out of the handicrafts and products sold in the shop go to the SHG and 5% go to the Community fund.

4.4 Homestays

Homestays are proposed to tourists in the GSTO and on Internet. In the GSTO, a special attention is given to the rotation of the suppliers to avoid conflicts. Whatever the sales canal, 80% of the income remains in the family and 20% goes to the community fund.

4.5 Other activities

From the income received from the local guides, anglers and other registered activity suppliers, 80% remain to the supplier and 20% goes to the community fund.
Annex 3 - Description of regulations, standards, norms and values

The following section describes the regulation, standards and norms, which will be followed during implementation of the Sanitation and Solid Waste project components:

- **Sanitation**

The treated sewage discharged from on-site treatment systems associated with the existing toilets finally go to the saturated brackish water layers, or to the water bodies or to the creek after percolation through soil layers. Following the discharge limits for liquid effluent specified by the MOEF in the Environment Protection Act, 1986 (and its subsequent amendments), this situation requires that the treated sewage should meet the requirement for discharge to inland surface water. This guideline specifies a BOD$_3$,$_{27}$ C value of 30 mg/l and TSS value of 100 mg/l. But the recent standards for the discharge of treated sewage to inland surface water, proposed by CPCB and also recommended by NGRBA for different sewerage projects are as follows:

<table>
<thead>
<tr>
<th>Liquid Effluent Discharge Standard as per Guideline</th>
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<tbody>
<tr>
<td><strong>Parameter</strong></td>
</tr>
<tr>
<td>BOD$<em>3$,$</em>{27}$</td>
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<tr>
<td>TSS</td>
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<tr>
<td>Faecal Coliform (FC)</td>
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</table>

This same guideline, has specified that for certain critical stretches of the river Ganges, the limit for BOD$_3$,$_{27}$ and TSS should be 20 mg/l and 30 mg/l. The state division of the NGRBA has verbally communicated to the Hydea-GBPL that this value is recommended by them for all Sewage treatment plants in the Gangetic West Bengal. Considering that the proposed sanitation system likely to serve the area for another 10-15 years, the more stringent value recommended by NGRBA for BOD and TSS (20 mg/l and 30 mg/l respectively) is adopted for the sanitation system of Ganga Sagar Mela. No data is available regarding the performance of the pit latrines used in the Ganga Sagar mela, to meet this requirement.
• Solid waste management (SWM)

SWM will adhere to the Municipal Solid Waste (Management and Handling) Rules, 2000. In particular, given the peculiarity of this project dealing with waste generated during the melas, which is assimilated to Municipal Solid Waste the proposed system, is compliant to the following criteria of Schedule I:

<table>
<thead>
<tr>
<th>No</th>
<th>Parameters</th>
<th>Compliance Criteria</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Collection of solid waste</td>
<td>V. Collected waste shall be transferred to community bins by hand-driven containerized carts or other small vehicle</td>
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<td></td>
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<td>VII. Waste (garbage, dry leaves) shall not be burnt</td>
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<td></td>
<td></td>
<td>VIII Stray animals shall not be allowed to move around waste storage facilities</td>
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<tr>
<td>2</td>
<td>Segregation of municipal solid waste</td>
<td>In order to encourage the citizens, municipal authority shall organize awareness programmes for segregation of wastes and shall promote recycling or reuse of segregated materials</td>
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<tr>
<td>3</td>
<td>Storage of municipal solid waste</td>
<td>I. Storage facilities shall be created and established by taking into account quantities of waste generation</td>
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<td>4</td>
<td>Transport of municipal solid waste</td>
<td>Vehicle used for transportation of waste shall be covered. Waste shall not be visible to public, nor exposed to open environment preventing their scattering.</td>
</tr>
<tr>
<td>5</td>
<td>Processing of municipal solid waste</td>
<td>i. The biodegradable waste shall be processed by composting, vermicomposting, anaerobic digestion or any other appropriate biological processing for stabilization of waste. It shall be ensured that compost shall comply with standard as specified in Schedule IV</td>
</tr>
<tr>
<td>6</td>
<td>Disposal of municipal solid waste</td>
<td>Land filling shall be restricted to non-biodegradable, inert waste and other waste that are not suitable either for recycling or for biological processing</td>
</tr>
<tr>
<td>Parameters</td>
<td>Concentration not exceed (mg/kg dry basis except pH value and C/N ratio)</td>
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