Initial Environmental Examination

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IND: Infrastructure Development Investment Program for Tourism (IDIPT) Tranche 4 — (a) Construction of Yatri Nivas for Arulmigu Abathsagayeswarar Temple at Alangudi Village, Thiruvarur District; (b) Construction of Rest House for Vedaranyeswarar Temple in Vedaranyam, Nagapattinam District, Tamil Nadu

Package No. IDIPT/TN/T4/NCB/03/2017

Prepared by the Department of Tourism and Civil Aviation of the Government of Tamil Nadu for the Asian Development Bank.

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CURRENCY EQUIVALENTS

(as of 15 December 2017)

Currency unit	–	Indian rupee (₹)
₹1.00	=	$0.015
$1.00	=	₹65.50

ABBREVIATIONS

ADB	-	Asian Development Bank
CAC	-	common air contaminants
CFE	-	consent for establishment
CFO	-	consent for operation
CRZ	-	Coastal Regulation Zone
DOT	-	Department of Tourism
DSC	-	Design and Supervision Consultant
EIA	-	Environmental Impact Assessment
EMP	-	Environmental Management Plan
GoI	-	Government of India
IEE	-	Initial Environmental Examination
NGO	-	non-government organization
NOC	-	No Objection Certificate
PIU	-	Project Implementation Unit
PMC	-	Project Management Consultant
PMU	-	Project Management Unit
RCC	-	reinforced cement concrete
ROW	-	right-of-way
SEAC		State or Union territory level Expert Appraisal Committee
SPS	-	Safeguard Policy Statement

NOTE

In this report, "$" refers to US dollars.

CONTENTS

EXECUTIVE SUMMARY

Background. The India Infrastructure Development Investment Program for Tourism (the Investment Program) envisages environmentally and culturally sustainable and socially inclusive tourism development in the project states of Himachal Pradesh, Punjab, Tamil Nadu and Uttarakhand, delivered through a multi-tranche financing facility (MFF) modality. Tranche IV includes Tamil Nadu state. Alangudi, with the most visited temples, is one of the proposed beneficiary tourist destination in Tamil Nadu under Tranche IV of the Subproject.

Alangudi is a small village under Alangudi Panchayat an Valangaimaan Taluk in Thiruvarur District of Tamil Nadu State, India. Located 33 km towards west from District headquarters Tiruvarur. It is 307 km from State capital Chennai Alangudi is surrounded by Nidamangalam Taluk towards South, Ammapettai Taluk towards west, Tiruvidaimarudur Taluk towards North, Kumbakonam Taluk towards North. Alangudi is renowned for its 'triglories' i.e Moorthy (The Presiding Deity), Sthalam (Place of divinity) and Theertham (The Holy Water).

Vedaranyam is a Taluk in Nagapattinam District of Tamil Nadu State, India. Vedaranyam Taluk Head Quarters is Vedaranyam town. It is located 48.3 KM towards South from District head quarters Nagapattinam. 349 KM from State capital Chennai towards the North. Vedaranyam Taluk is bound by Thalanayar Taluk towards the North, Muthupettai Taluk towards the west, Tirutturaippundi Taluk towards the North, Keelaiyur Taluk towards the North. The recorded history of Vedaranyam is found from the inscriptions in Vedaranyeswarar Temple. The Vedaranyeswarar temple, an ancient Hindu temple dedicated to Shiva, is located in Vedaranyam. The temple has a shrine for Thyagaraja (a form of Shiva), known for "Hamsapthanathaanam", the dance pose similar to the gait of a swan.

Executing and implementing agencies. Tamil Nadu Infrastructure Development Investment Program for Tourism (TN-IDIPT) is responsible for the implementation of the subproject. The TN-IDIPT Project Management Unit (PMU) will be responsible for overall project management and safeguards compliance monitoring of contractor(s) during construction. The PMU will recruit an environmental staff (or a consultant) who will be working along with the officer designated by TN-IDIPT for environmental safeguards, prior to the award of the civil works contract. Both PMU environmental staff and TN-IDIPT officer will be primarily responsible for ensuring that the EMP is properly implemented and will prepare the environmental monitoring reports for submission to ADB at least twice a year during construction, and annually during operation phase. TN-IDIPT will inform the contractor(s) of their responsibility to comply with the EMP and the requirements of ADB.

Categorization. Alangudi/Vedaranyam subproject package IDIPT/TN/T4/NCB/03/2017 is classified as environmental category B per ADB SPS as no significant impacts are envisioned. Accordingly, this Initial Environmental Examination (IEE) has been prepared to assess the environmental impacts and provide mitigation and monitoring measures to ensure no significant impacts as a result of the subproject.

Subproject Scope. The major scope of this subproject is the (a) Construction of Yatri Nivas for Arulmigu Abathsagayeswarar Temple at Alangudi Village, Valangaiman Taluk, Thiruvarur District, Tamil Nadu. (b) Construction of Rest House for Vedaranyeswarar Temple in Vedaranyam, Nagapattinam District, Tamil Nadu.

Proposed subproject. The primary objective of this subproject is to provide Tourism at Alangudi & Vedaranyam. The following components are proposed under the subproject (a)

“Construction of Yatri Nivas for Arulmigu Abathsagayeswarar Temple at Alangudi Village, Thiruvarur District”: (i) Dormitory – ground floor and first floor area (G+1) to accommodate at least 133 pilgrims, (ii) Type II cottage – ground and one storey reinforced cement concrete (RCC) structure (G+3), (iii) Type I cottage – ground and first floor (G+1), (iv) Office and restaurant – ground floor (G) only, (v) Drivers’ dormitory – ground and first floor (G+1); (b) Construction of Rest Hall for Pilgrims in Arulmigu Vedharanyam Temple, Vedharanyam Town & Taluk Nagapattinam District.

Description of Environment: Thiruvarur district is one of the 32 districts in the Tamil Nadu State of India and occupies an area of 2161 km². It lies between Nagapattinam district on the east and Thanjavur District on the west, and is bounded by the Palk Strait on the south. According to 2011 census, Thiruvarur district had a population of 1,264,277. Major towns are Thiruvarur, Thiruthuraipoondi, Nachikulam, Muthupettai, Mannargudi. Apatsahayesvarar Temple, Alangudi or Guru Sthalam or Tiru Irum Poolaiis a Hindu temple dedicated to Lord Shiva located in the village of Alangudi in the Valangaiman taluk of Thiruvarur district, is a place of architectural interest and an important tourist centre.The temple complex covers two acres and it houses a two tier gateway tower known as gopurams, one facing the Apathsaheswarar shrine and other towards north. The temple is maintained and administered by the Hindu Religious and Charitable Endowments Department (HR&CE) of the Government of Tamil Nadu. The temple is counted as one of the Navagraha Temples for planet Guru (Jupiter). The temple is one of the most visited temples in the district.

The town of Vedaranyam, a major tourist destination is situated near in Nagapattinam district of Tamil Nadu. It has a resident population of 34266, 2011 census. The existing basic infrastructural services in the town include i) Dug/bore well based piped water supply, ii) household/public toilets with septic tanks for disposal of domestic wastes and iii) a system of municipal solid waste collection and disposal by composting. Vedaranyam is located away from CRZ areas as per the CZMP for Tamil Nadu. Vedaranyam is a place of architectural interest and an important tourist centre. The recorded history of Vedaranyam is found from the inscriptions in Vedaranyeswarar Temple. The Vedaranyeswarar temple, an ancient Hindu temple dedicated to Shiva, is located in Vedaranyam. The temple has a shrine for Thyagaraja (a form of Shiva), known for "Hamsapthanathaanam", the dance pose similar to the gait of a swan.

The selection of components is consistent with the subproject selection criteria outlined in the Environmental Assessment and Review Framework (EARF) aimed at enhancing protection of these sites and enhancing their environmental quality. Subprojects are consistent with defined management plans designed to protect environmentally sensitive and cultural locations. Management plans guided subproject design and location; therefore, all proposed facilities in natural areas are located outside sensitive areas and sited in designated tourist development zones.

Environmental Management. An environmental management plan (EMP) is included as part of this IEE, which includes (i) mitigation measures for environmental impacts during implementation; (ii) an environmental monitoring program, and the responsible entities for mitigating, monitoring, and reporting; (iii) public consultation and information disclosure; and (iv) grievance redress mechanism. A number of impacts and their significance have already been reduced by amending the designs. The EMP will be included in civil work bidding and contract documents.

Impacts are readily mitigated through careful siting, specific selection criteria for procuring

contractors with demonstrated experience; execution of proven mitigation measures during the design; and adoption of good engineering practices during construction and implementation. A detailed monitoring plan prepared as part of this IEE will further mitigate negative environmental impacts during implementation.

Potential induced impacts are addressed through the following: (i) awareness- building of local management plans at proposed sites specifically addressing the need to regulate tourism related development and planning in the area through coordination with related Government Departments and local land use committees; and (ii) project-supported environmental awareness campaigns in surrounding communities to encourage participatory sustainable development consistent with eco-tourism principles and in compliance with the state's tourism policy ecotourism aspects.

The Investment Program includes upfront and on-going supervision and training assistance for environmental monitoring reporting in project management structures. The effective implementation of the measures proposed will be ensured through the building up of capacity towards environmental management within the project management unit (PMU) supplemented with the technical expertise of a Safeguards Specialist as part of the Design and Supervision Consultants (DSC) and Project Management Consultants (PMC). Further, the environmental monitoring plans provide adequate opportunities towards course correction to address any residual impacts during construction or operation stages.

Tranche IV includes additional environmental awareness-building to raise conservation values consistent with management plans and Tamil Nadu's environmental and tourism policies (which emphasize ecotourism) amongst local communities and local governments in order to ensure future sustainable development in and around these locations.

Information Disclosure, Consultation, and Participation. Public consultations were done in the preparation of the project and IEE. Ongoing consultations will occur throughout the project implementation period. A grievance redress mechanism (GRM) is described within the IEE to ensure any public grievances are addressed quickly.

Grievance Redress Mechanism. A GRM will be established by the TN-IDIPT to deal with complaint(s) from affected persons (TNs) during implementation. This would be done in line with the GRM as described in the IDIPT environmental assessment and review framework (EARF) that has been prepared for the IDIPT and this IEE. Affected persons can seek redress of their grievance at three levels: (i) the TN-IDIPT at implementation level, (ii) the grievance redress committee (GRC) at PMU level, and (iii) the appropriate courts of law. GRC is set up by the PMU as soon as the project commences and will function as such from construction to operation. The PMU will ensure the representation of women on the members of GRC which will consist of representatives from the local Panchayat Head, a District Revenue Commissioner, representative from the contractor(s) only during construction phase, designated staff of TN-IDIPT on safeguards, Manager/Director of TN-IDIPT, and a witness of the complainant/affected person.

Monitoring and Reporting. The PMU, PIU, PMC and DSC will be responsible for environmental monitoring. The PIU, with support from the DSC, will submit semi-annual monitoring reports to the PMU. The PMU will consolidate the semi-annual reports and send it to ADB. ADB will post the environmental monitoring reports on its website.

Conclusion. The proposed subproject is unlikely to cause significant adverse impacts. The

potential impacts that are associated with design, construction and operation can be mitigated to standard levels without difficulty through proper engineering design and the incorporation of application of recommended mitigation measures and procedures. Based on the findings of the IEE, there are no significant impacts and the classification of the subproject as Category B is confirmed. No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB SPS 2009 or Government of India EIA Notification 2006.

I. INTRODUCTION

A. Background

1. The proposed Tranche IV (the Project) targets enhanced economic growth and provision of livelihood opportunities for local communities through tourism infrastructure development with a focus on preservation and development of natural and cultural heritage and incidental services. The Project supports the states of Uttarakhand and Tamil Nadu to develop the tourism sector as a key driver for economic growth.

2. The Project aims to enhance contribution of the tourism industry to sustainable and inclusive economic growth for each participating state. Increased visits of domestic and international tourists to tourist destinations within each participating state would be the outcome of the Project.

3. The India Infrastructure Development Investment Program for Tourism (IDIPT) envisages environmentally and culturally sustainable and socially inclusive tourism development in the project states of Himachal Pradesh, Punjab, Tamil Nadu and Uttarakhand, delivered through a multi-tranche financing facility (MFF) modality. Tranche IV includes Tamil Nadu state. Alangudi, with the most visited temples in Tamil Nadu, is one of the proposed beneficiary tourist destination in Tamil Nadu under Tranche IV of the Subproject.

4. Alangudi is a small village under Alangudi Panchayat an Valangaimaan Taluk in Thiruvarur District of Tamil Nadu State, India. Located 33 km towards west from District headquarters Tiruvarur. It is 307 km from State capital Chennai. Alangudi is surrounded by Nidamangalam Taluk towards South, Ammapettai Taluk towards west, Tiruvidaimarudur Taluk towards North, Kumbakonam Taluk towards North. Alangudi is renowned for its 'triglories' i.e Moorthy (The Presiding Deity), Sthalam (Place of divinity) and Theertham (The Holy Water).

5. Vedaranyam is a place of architectural interest and an important tourist centre. The recorded history of Vedaranyam is found from the inscriptions in Vedaranyeswarar Temple. The Vedaranyeswarar temple, an ancient Hindu temple dedicated to Shiva, is located in Vedaranyam. The temple has a shrine for Thyagaraja (a form of Shiva), known for "Hamsapthanathaanam", the dance pose similar to the gait of a swan.

6. **Executing and implementing agencies**. The executing agency is the Department of Tourism and Culture, Government of Tamil Nadu. Project Management Unit (PMU) is set up at Alangudi to coordinate the overall execution. The implementing agency is Hindu Religious and Endowments Culture (HR & CE). Project Implementation Unit (PIU) is set up at Alangudi, to be supported by the Design Supervision Consultant (DSC). The asset owner is the Hindu Religious and Endowments Culture (HR & CE).

7. **Proposed subproject**. The primary objective of this subproject is to provide Tourism at Alangudi & Vedaranyam. The following components are proposed under the subproject (a) "Construction of Yatri Nivas for Arulmigu Abathsagayeswarar Temple at Alangudi Village, Thiruvarur District": (i) Dormitory – ground floor and first floor area (G+1) to accommodate at least 133 pilgrims, (ii) Type II cottage – ground and one storey reinforced cement concrete (RCC) structure (G+3), (iii) Type I cottage – ground and first floor (G+1), (iv) Office and restaurant – ground floor (G) only, (v) Drivers' dormitory – ground and first floor (G+1); (b) Construction of Rest Hall for Pilgrims in Arulmigu Vedharanyam Temple, Vedharanyam Town & Taluk Nagapattinam District.

8. The IEE was based on a careful review of subproject site plans and reports defined management plans; field visits, and secondary data to characterize the environment and identify potential impacts; and consultations/ discussions with stakeholders. An environmental management plan (EMP) outlining the specific environmental measures to be adhered to during implementation of the subproject has been prepared. Subprojects will provide needed environmental and tourist infrastructure to improve the environmental management and quality of the sites towards preserving their ecological and cultural integrity. The subproject will conform to all Government regulations, policies, and standards, as well as Asian Development Bank's Safeguard Policy Statement (2009).

9. **Categorization**. Alangudi/Vedaranyam subproject package IDIPT/TN/T4N/NCB/03/2017 is classified as environmental category B per ADB SPS as no significant impacts are envisioned. Accordingly, this Initial Environmental Examination (IEE) has been prepared to assess the environmental impacts and provide mitigation and monitoring measures to ensure no significant impacts as a result of the subproject.

10. Under the EIA Notification, 2006 promulgated under Environment (Protection) Act 1986 of the MOEF, Govt of India, all developmental projects and activities listed under the schedule of the Notification are broadly categorized in to two categories - Category A and Category B, based on the spatial extent of potential impacts on human health and natural and manmade resources.

11. All projects or activities under Category 'A' in the Schedule, including expansion and modernization of existing projects or activities and change in product mix, shall require prior environmental clearance from the Central Government in the Ministry of Environment and Forests (MoEF) on the recommendations of an Expert Appraisal Committee (EAC) to be constituted by the Central Government for the purposes of this Notification.

12. All projects or activities under Category 'B' in the Schedule, including expansion and modernization of existing projects or activities as specified in sub paragraph (ii) of paragraph 2, or change in product mix as specified in sub paragraph (iii) of paragraph 2, but excluding those which fulfill the General Conditions (GC) stipulated in the Schedule, will require prior environmental clearance from the State/Union territory Environment Impact Assessment Authority (SEIAA). The SEIAA shall base its decision on the recommendations of a State or Union territory level Expert Appraisal Committee (SEAC) as to be constituted for in this Notification. In the absence of a duly constituted SEIAA or SEAC, a Category 'B' project shall be treated as a Category 'A' project.

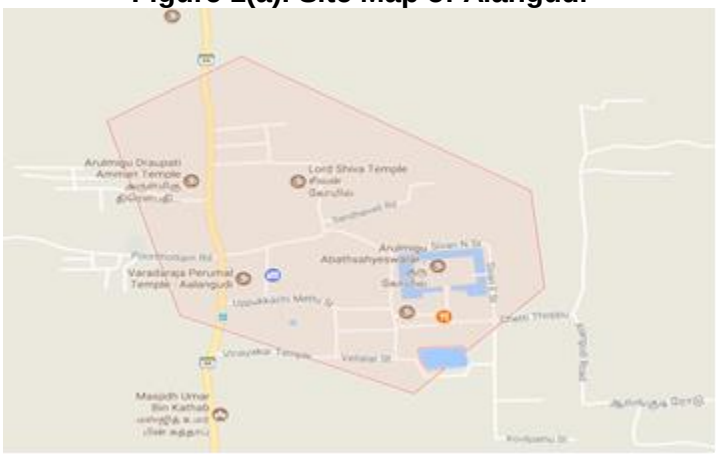
13. **Purpose of the IEE**. The IEE was based on preliminary design and will be updated once detailed design is completed. The adverse environmental impacts for this contract package are primarily related to the construction of yatri nivas for Alangudi Temple in Thiruvarur for the state of Tamil Nadu. Therefore, as per the Asian Development Bank's (ADB) Environmental Assessment Guidelines (SPS 2009), the subproject components are categorized as 'B' and an IEE carried out. This IEE provides mitigation measures for impacts related to location, design, construction, operation, and maintenance. The REA checklist is attached as Appendix 3 in this report.

II. DESCRIPTION OF THE SUBPROJECT

A. Existing Condition and Need of the Subproject

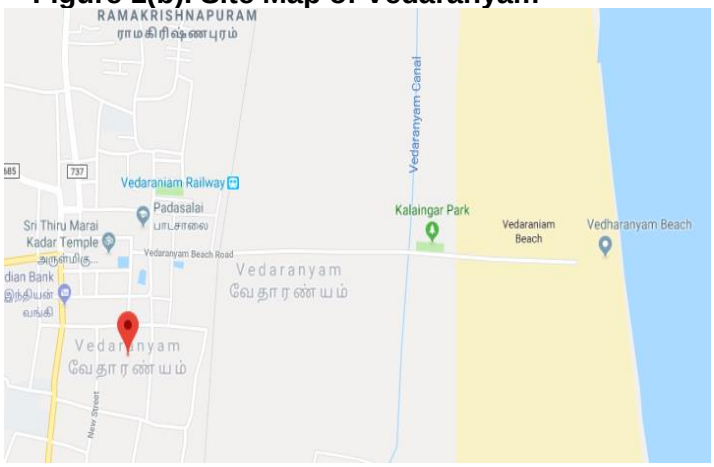
14. **Location.** Alangudi is a small village under Alangudi Panchayat an Valangaimaan Taluk in Thiruvarur District of Tamil Nadu State, India.Located 33 km towards west from District headquarters Tiruvarur. It is 307 km from State capital Chennai Alangudi is surrounded by Nidamangalam Taluk towards south, Ammapettai Taluk towards west, Tiruvidaimarudur Taluk towards north, Kumbakonam Taluk towards north. Thanjavur, Thiruvarur, Nanjikottai, Thiruthuraipoondi are the nearby cities to Alangudi. This place is in the border of the Thiruvarur District and Thanjavur District. Thanjavur District Kumbakonam is north towards this place. The site map of Alangudi is given in figure 1(a) below.

Figure 1(a). Site Map of Alangudi



15. Vedaranyam is a Taluk in Nagapattinam District of Tamil Nadu State, India. Vedaranyam Taluk Head Quarters is Vedaranyam town . It is located 48.3 KM towards South from District head quarters Nagapattinam. 349 KM from State capital Chennai towards North. Vedaranyam Taluk is bounded by by Thalanayar Taluk towards North , Muthupettai Taluk towards west, Tirutturaippundi Taluk towards North, Keelaiyur Taluk towards North. Vedaranyam City, Thiruthuraipoondi City, Nagapattinam City, Thiruvarur City are the nearby Cities to Vedaranyam. It is in the 6 m elevation(altitude) . It is near to bay of bengal. There is a chance of humidity in the weather. Vailankanni (Velankanni), Nagapattinam, Thiruvarur, Nagore, Navagraha Sthalas are the nearby Important tourist destinations. The site map of Vedaranyam is given in figure 1(b) below.

Figure 1(b). Site Map of Vedaranyam



16. **Brief History**. Thiruvarur district is one of the 32 districts in the Tamil Nadu State of India and occupies an area of 2161 km². It lies between Nagapattinam District on the east and Thanjavur District on the west, and is bounded by the Palk Strait on the south. According to 2011 census, Thiruvarur district had a population of 1,264,277. Major towns are Thiruvarur, Thiruthuraipoondi, Nachikulam, Muthupettai, Mannargudi. Apatsahayesvarar Temple, Alangudi or Guru Sthalam or Tiru Irum Poolaiis a Hindu temple dedicated to Lord Shiva located in the village of Alangudi in the Valangaiman taluk of Thiruvarur District, is a place of architectural interest and an important tourist centre.The temple complex covers two acres and it houses a two tier gateway tower known as *gopurams*, one facing the Apathsaheswarar shrine and other towards North. The temple is maintained and administered by the Hindu Religious and Charitable Endowments Department(HR&CE) of the Government of Tamil Nadu.The temple is counted as one of the Navagraha Temples for planet Guru (Jupiter). The temple is one of the most visited temples in the district.

17. Alangudi is renowned for its 'triglories' i.e Moorthy (The Presiding Deity), Sthalam (Place of divinity) and Theertham (The Holy Water).

18. Vedaranyam is a town in Nagapattinam district in the Indian state of Tamil Nadu. The town is named after the presiding deity of the Vedaranyeswarar Temple. The recorded history of Vedaranyam is known from medieval Chola period of the 9th century and has been ruled, at different times, by the Medieval Cholas, Later Cholas, Later Pandyas, Vijayanagar Empire and the British. During India's independence struggle, C. Rajagopalachari, who later became independent India's first Governor-General, launched a salt march in Vedaranyam parallel to the Dandi March launched by Gandhi in 1930 to protest against the sales tax levied on salt extraction.

19. The town is administered by the Vedaranyam municipality, which covers an area of 36.26 sq km. As of 2011, the town had a population of 34,266. Vedaranyam was a part of Thanjavur District till 1991 and Nagapattinam District from then on. The town is a part of the fertile Cauvery delta region, but salt extraction and prawn cultivation are the major occupations. Roadways are the major mode of transportation to Vedaranyam and the nearest Airport is Tiruchirapalli Airport, located 135 km (84 mi) away from the town.Vedaranyam is named after Vedaranyeswarar, the presiding deity of the Vedaranyeswarar Temple, a Hindu temple dedicated to Shiva. The place was earlier known as "Tirumaraikadu", meaning the place where Vedas, oldest scriptures of Hinduism, originated. The 7th century Saiva canonical work

Tevaram by Appar and Tirugnanasambandar mentions the place as "Tirumaraikadu". As per Hindu legend, the Vedas worshipped Shiva in this place, giving the name "Vedaranyam" to the place.

20. **Existing Conditions**. The Arulmigu Abathsahyeswarar Temple also known as Guru Temple, located at Alangudi Valangaiman Taluk, Thiruvarur District is an important tourist destination. Most of the tourists prefer to stay at Thiruvarur considering that it is a bigger place or some small private places at Alangudi. Considering this, Tamil Nadu Tourism Development Corporation is planning to construct a Yatri Nivas[1] at Alangudi to provide accommodation for the tourists from different economic backgrounds. Tourists have generally been satisfied with the services and good hospitality facility at other Yatri Nivas's and so TTDC envisages this project to do well. Most of the private hotels are profit oriented. But since this hotel is going to be operated by a Government body it will be service oriented, so it is essential to have a hotel at Alangudi operated by the Government body. To provide accommodation with modern facilities at a reasonable cost to the tourists, the new Yatri Nivas type accommodation with all the modern facilities needs to be constructed at Alangudi.

21. The Vedaranyeswarar temple, an ancient Hindu temple dedicated to Shiva, is located in Vedaranyam. The temple has a shrine for Thyagaraja (a form of Shiva), known for "Hamsapthanathaanam", the dance pose similar to the gait of a swan. Vedaranyam, Nagapattinam District is an important tourist destination. Most of the tourists prefer to stay at Nagapattinam considering that it is a bigger place or some small private places at Vedaranyam. Considering this, Tamilnadu Tourism Development Corporation is planning to construct a Rest Hall at Vedaranyam, Nagapattinam District to provide accommodation for the tourists from different economic backgrounds. Tourists have generally been satisfied with the services and good hospitality facility at other places and so TTDC envisages this project to do well. Most of the private Rest Halls are profit oriented. But since this Rest Hall is going to be operated by a Government body it will be service-oriented so it is essential to have a Rest Hall at Vedaranyam, Nagapattinam District operated by the Government body.

22. **Proposed Subproject**. The primary objective of this subproject is to provide Tourism at Alangudi. The following components are proposed under the subproject

(a) "Construction of Yatri Nivas for Arulmigu Abathsagayeswarar Temple at Alangudi Village, Thiruvarur District"

(i) Office and Restaurant. This building serves the basic requirement of the site. It is located near the entry itself. It is accessible from all the other buildings as well. This is located behind the planned VIP Cottage building. This building has been planned with ground Floor of area 262.92 m^2. It is a RCC structure roof slab terrace and sunshade covered with Mangalore tiles supported by steel trusses members.

(ii) Dormitory Building [(ground and first floor) G+1], 28 rooms to accommodate 280 persons. The dormitory building has been planned as a RCC structure and the roof covered with Mangalore tiles which are supported by steel trusses members. The building is planned with ground and first floor an area of 1022.55 m^2.

(iii) Type II Cottage G+3. This building serves the requirement of tourists. It is located towards the rear of the site, behind the planned office and restaurant building. This building has been planned as a Ground + 1 Story RCC structure. The building is planned with an area of 266.34 m^2 (nearly 2866 ft^2).

[1] In English, "yatri" means traveler and "nivas" means place of a place of residence, a house, or a block of flats.

(iv) Driver's Dormitory. This building serves the requirement of drivers of the tourists and some staff. It is located towards the rear of the site, to the left of the planned dormitory building. This building has been planned as a Ground + 1 Story RCC structure, the roof covered with Mangalore tiles which are supported by steel trusses members. The building is planned with an area of 265 m^2 (nearly 2852.44 ft^2).

(v) Type I Cottage – [Ground and First floor (G+1)]. This building serves the requirement of the tourists with his/her family. It is located towards the entry of the site, to the left of the planned office and restaurant. This building has been planned as a ground floor and first floor. It is a RCC structure. The building is planned with a ground area/built-up area of 520.56 m^2 (nearly 5603.26121 ft^2).

(vi) Provision for lawns, garden and fountain and children play area

(vii) Provision for internal roads, pavers for car parking, arch entrance and exit gate

(viii) Provision for bore well (1no.) and external water supply.

(b) Construction of Rest Hall for Pilgrims in Arulmigu Vedharanyam Temple, Vedharanyam Town & Taluk Nagapattinam District.

23. All sites for subproject are owned by government thus no land acquisition or No Objection Certificate (NOC) is required. The sites are not within or adjacent to any protected area. Location map of proposed site is shown in Figure 2 & proposed site plan is in Figure 3. All pre-construction, construction, and operation activities that are likely to cause environmental impacts were identified, and evaluated to assess their magnitude, duration, and potential receptors in consultation with the stakeholders. Consultations were held with the government representatives HR&CE Department and local communities. Accordingly, an IEE has been prepared for each package to mitigate any adverse impacts that may occur during implementation of the project.

24. The design, material and scale will be compatible to the local architectural, physical, cultural and landscaping elements. Preference will also be given to the use of local material and labor as best as possible.

Figure:2 (a) Proposed Site Location - Alangudi

Figure :3(a) Proposed site plan for subproject components - Alangudi

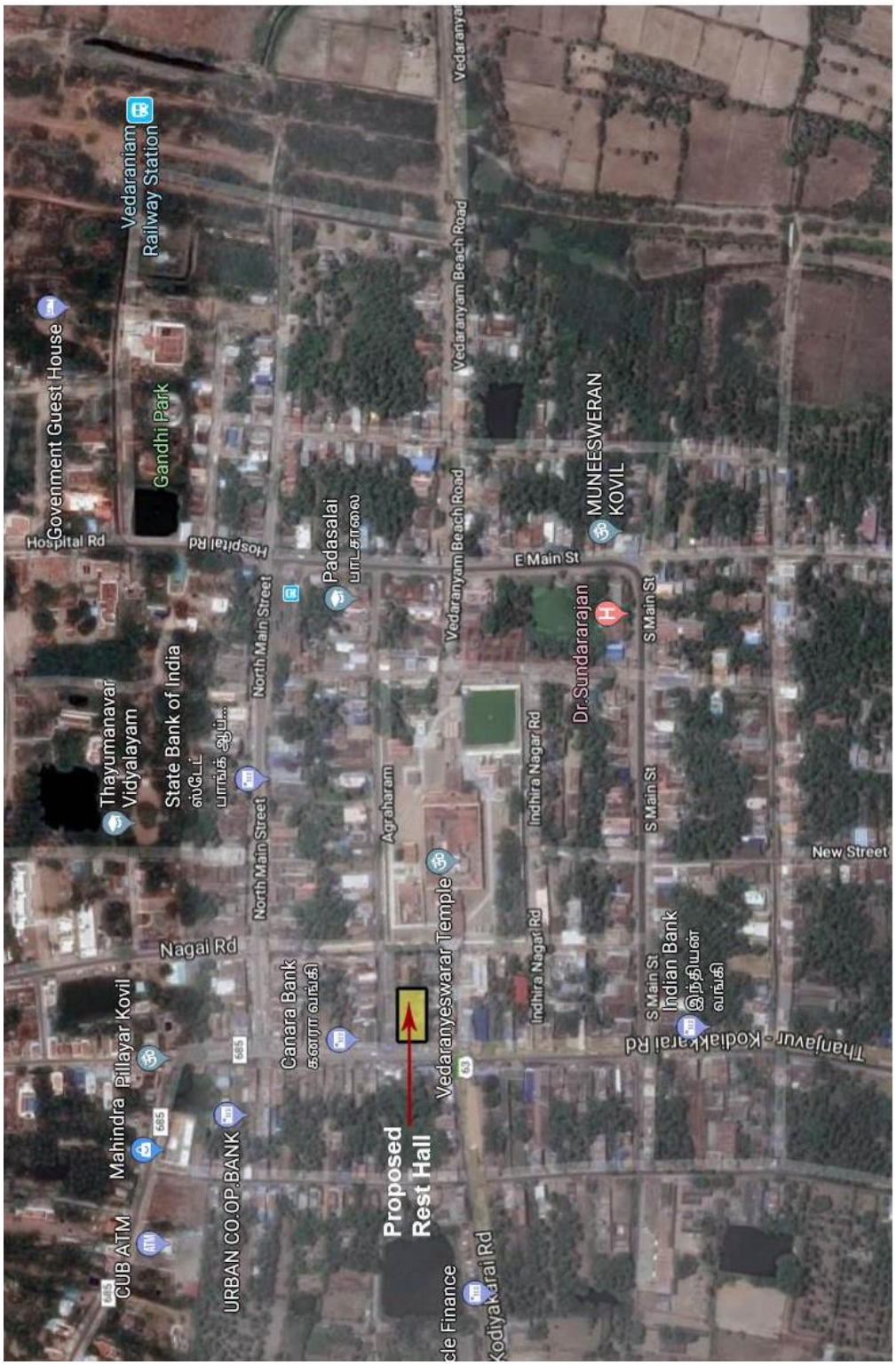


Figure:2 (b) Proposed Site Location - Vedaranyam

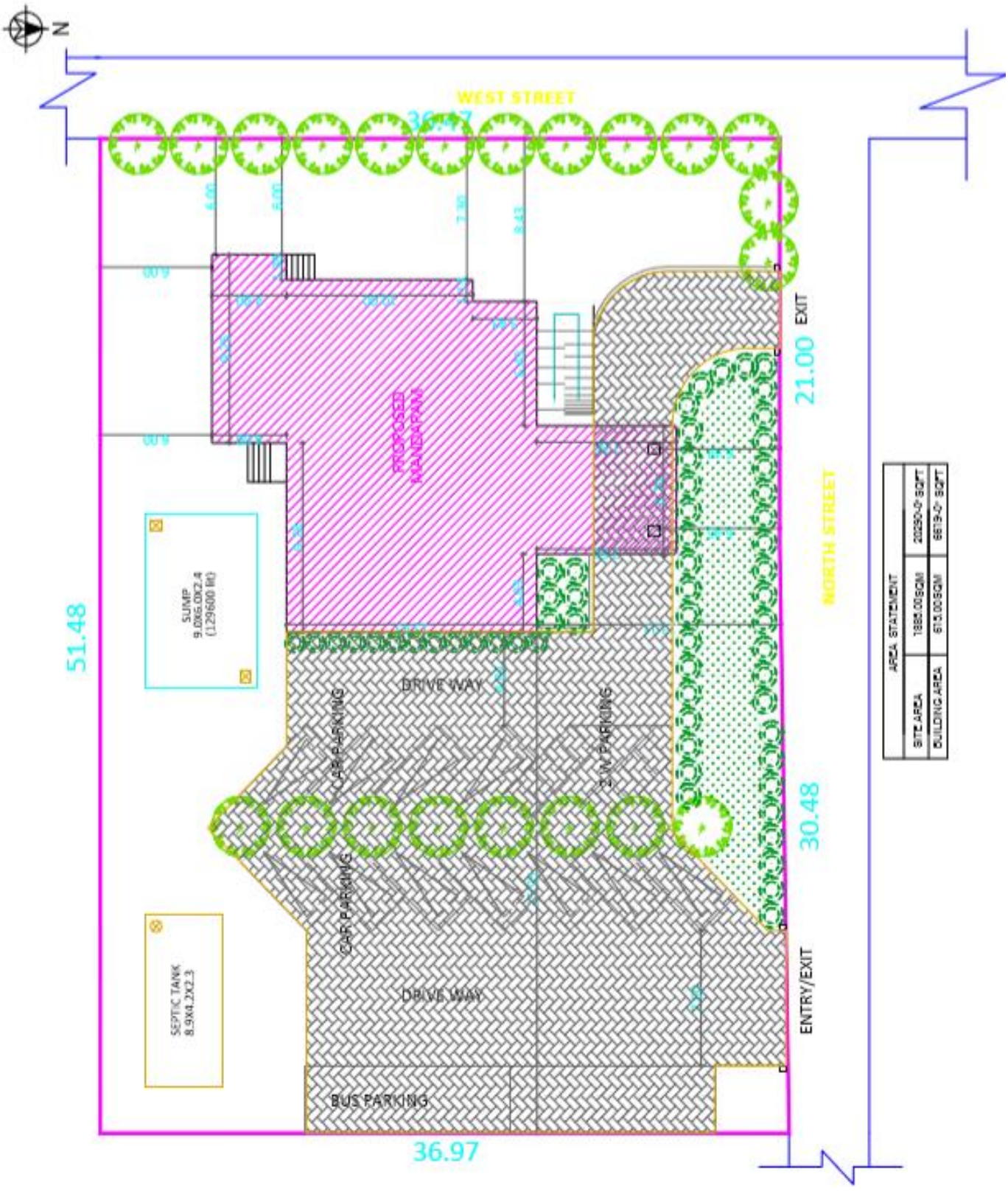


Figure :3(b) Proposed site plan for subproject components - Vedaranyam

B. Implementation Schedule

25. Preliminary design of the subproject has been done by the Design and Supervision Consultant (DSC) team and will be finalized during detailed design stage. It is estimated that construction period will cover 18 months.

26. The final detailed implementation schedule will be provided in the updated IEE once the detailed design phase is completed.

III. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

A. ADB Policy

27. ADB requires the consideration of environmental issues in all aspects of ADB's operations, and the requirements for environmental assessment are described in ADB SPS, 2009. This states that ADB requires environmental assessment of all project loans, program loans, sector loans, sector development program loans, and loans involving financial intermediaries, and private sector loans.

28. **Screening and Categorization**. The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type and location of the project, the sensitivity, scale, nature and magnitude of its potential impacts, and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impact and are assigned to one of the following four categories:

(i) Category A: A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An environmental impact assessment is required.

(ii) Category B: A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible and, in most cases, mitigation measures can be designed more readily than for category A projects. An initial environmental examination is required.

(iii) Category C: A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed.

(iv) Category FI: A proposed project is classified as category FI if it involves investment of ADB funds to or through a financial intermediary

29. **Environmental Management Plan**. An EMP which addresses the potential impacts and risks identified by the environmental assessment shall be prepared. The level of detail and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the Project's impact and risks.

30. **Public Disclosure**. The IEE will be put in an accessible place (e.g., local government offices, libraries, community cum tourist reception centers, etc.), and a summary translated into Hindi for the project affected people and other stakeholders shall also be disclosed. The following safeguard documents will be put up in ADB website so that the affected people, other stakeholders, and the general public can provide meaningful inputs into the project design and implementation:

(i) For environmental category A projects, a draft EIA report at least 120 days before Board consideration;
(ii) Final or updated EIA and/or IEE upon receipt; and
(iii) Environmental monitoring reports submitted by the Project Management Unit (PMU) during project implementation upon receipt.

31. During the design, construction, and operation of the project the pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the **World bank Environmental, Health, and Safety (EHS) Guidelines -General EHS Guidelines: Occupational, Health and safety** (www.ifc.org/ifcext/enviro.nsf/Content/ Environmental guidelines) and EHS Guidelines for water & sanitation will be followed (http://www.ifc.org/wps/wcm/connect/e22c050048855ae0875cd76a6515bb18/Final%2B-%2BWater%2Band%2BSanitation.pdf?MOD=AJPERE)

32. Employers and supervisors are obliged to implement all reasonable precautions to protect the health and safety of workers. Preventive and protective measures should be introduced according to the following order of priority:

(i). Eliminating the hazard by removing the activity from the work process. Examples include substitution with less hazardous chemicals, using different manufacturing processes, etc;
(ii). Controlling the hazard at its source through use of engineering controls. Examples include local exhaust ventilation, isolation rooms, machine guarding, acoustic insulating, etc;
(iii). Minimizing the hazard through design of safe work systems and administrative or institutional control measures. Examples include job rotation, training safe work procedures, lock-out and tag-out, workplace monitoring, limiting exposure or work duration, etc.
(iv). Providing appropriate personal protective equipment (PPE) in conjunction with training, use, and maintenance of the PPE
(v). Comply with: Child Labour (Prohibition and Regulation) Amendment Act, 2016; Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 as amended from time to time from appropriate authorities; Trade Unions Act, 1926; The Building and Other Construction Workers (Regulation of Employment and conditions of Service Act) 1996 and the Cess Act of 1996; The Factories Act, 1948; and Prohibition of Employment as Manual Scavengers and Their Rehabilitation Act 2013.

33. During the design, construction, and operation of the project, the borrower/client will apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards, such as the World Bank Group's Environment, Health and Safety Guidelines.

A comparison on noise level requirements between the WB EHS guidelines and the NAAQS under the Air (Prevention and Control of Pollution) Act, 1981 of GOI as given in table B shows that the required levels are equal for residential, institutional and educational areas. The NAAQS requirements for commercial areas are more stringent while the WB EHS requirement for daytime noise in industrial area is more stringent.

Table A3.1: Ambient Noise level standards of WB EHS Vs. the GOI NAAQS

Receptor	WB EHS		GOI NAAQS	
	Daytime	Nighttime	Daytime	Nighttime
	7:00-22:00	22:00-7:00	6:00-22.00	22:00-6:00
Residential	55	45	55	45
Institutional; educational			None	None
Industrial	70	70	75	70
Commercial			65	55
Silence Zone	None	None	50	40

B. National and State Laws

34. Implementation of the subproject will be governed by the national and State of Tamil Nadu environmental acts, rules, regulations, and standards. These regulations impose restrictions on activities to minimize/mitigate likely impacts on the environment. It is the responsibility of the project executing and implementing agencies to ensure subprojects are consistent with the legal framework, whether national, state or municipal/local. Compliance is required in all stages of the subproject including design, construction, and operation and maintenance.

35. The realm of environmental regulations and mandatory requirements for the proposed subproject is shown in Table 1. The EIA Notification (2006) by the Government of India Ministry of Environment, Forests and Climate Change(MOEFCC) specifies the mandatory environmental clearance requirements. Accordingly, all projects and activities are broadly categorized in to two categories2 - Category A and Category B, based on the spatial extent of potential impacts and potential impacts on human health and natural and man-made resources.

36. Applicability of these laws, regulations, policies etc. has been verified and their applicability matrix has been presented in Table 1.

37. The Department of Tourism and HR&CE will ensure compliance of legal and regulatory framework during the project cycle.

[2] All projects or activities included as Category A in the Schedule, including expansion and modernization of existing projects or activities and change in product mix, will require prior environmental clearance from the Central Government in the Ministry of Environment and Forests, Climate Change (MOEFCC) on the recommendations of an Expert Appraisal Committee (EAC) to be constituted by the Central Government for the purposes of this Notification. All projects or activities included as Category B in the Schedule, including expansion and modernization of existing projects or activities as specified in sub paragraph (ii) of paragraph 2, or change in product mix as specified in sub paragraph (iii) of paragraph 2, but excluding those which fulfil the General Conditions (GC) stipulated in the Schedule, will require prior environmental clearance from the State/Union territory Environment Impact Assessment Authority (SEIAA). The SEIAA will base its decision on the recommendations of a State or Union territory level Expert Appraisal Committee (SEAC) as to be constituted for in this Notification. In addition, GC of the Notification specifies that any project or activity specified in Category B will be treated as Category A, if located in whole or in part within 10 km from the boundary of (i) protected Areas notified under the Wild Life Protection) Act, 1972, (ii) critically polluted areas as notified by the Central Pollution Control Board from time to time, (iii) notified eco-sensitive areas, and (iv) inter-State boundaries and international boundaries.

Table 1: Applicability of Acts and Rules

	Acts and Rules	Year	Compliance Criteria
1	Environment (Protection) Act	1986	This act is applicable all environmental Notifications, rules and schedules issued under this act.
2	Environment Impact Assessment Notification	2006	As per the Notification, Projects categorized as A and B need prior Environmental clearance from the Central and State Expert Appraisal Committee respectively. But, this Subproject does not come under the purview of the above categories hence this Notification is not applicable.
3	Forest Conservation Act	1927 and 1980	This Act will be applicable in case the proposed project road is passing through the Forest Areas which requires the diversion of forest land to the non-forestry purposes. The subproject site is not within forest areas and tree-cutting is not required, thus, this Act is not applicable.
4	Wild Life (Protection) Act	1972	This act will be applicable in case the project road traverses through wildlife protected areas for which permission will be sought from National Board for wildlife. The subproject site is not within or adjacent to wildlife protected areas, thus, this Act is not applicable.
5	Coastal Regulation Zone (CRZ) Notification	1991 and 2011	Per the notification, the coastal land up to 500m from the High Tide Line (HTL) and a stage of 100m along banks of creeks, estuaries, backwater and rivers subject to tidal fluctuations, is called the CRZ. Government of Tamil Nadu have prepared Coastal Zone Management Plan Maps for its entire coastal stretches of Tamil Nadu on the basis of CRZ Notification 1991. The activities in CRZ areas have been regulated based on the above approved Coastal Zone Management Plan maps till date. CRZ-III-Areas that are relatively undisturbed and those do not belong to either CRZ-I or II which include coastal zone in the rural areas (developed and undeveloped) and also areas within municipal limits or in other legally designated urban areas, which are not substantially built-up. The subproject is located in the bank of backwater categorized us CRZ-III area. Regulations: a) The area up to 200m from the HTL is be

	Acts and Rules	Year	Compliance Criteria
			earmarked as 'No Development Zone'. No construction shall be permitted in this zone except for repairs of existing authorized structures not exceeding existing FSI, existing plinth area and existing density. However, the following uses may be permissible in this zone- agriculture, horticulture, gardens, pastures, parks, play fields, forestry and salt manufacture from sea water. b) Development of vacant plots between 200 and 500m of High Tide Line in designated areas of CRZ-III with prior approval of Ministry of Environment and forests permitted for construction of hotels/beach resorts for temporary occupation of tourists / visitors. c) Construction/ reconstruction of dwelling units between 200m and 500m of the High Tidal Line permitted so long as it is within the ambit of traditional rights and customary uses such as existing fishing villages and gothans. Building permission for such Construction/reconstruction will be subject to the conditions that the total member of dwelling unit shall not be more than twice the number of existing units; total area covered on all floors shall not exceed 9 meters and construction shall not be more than 2 floors (ground floor plus one floor). d) Reconstruction/alteration of an existing authorized building permitted subject to (1) to (3) above. The subproject does not involve any new developments, therefore, it does not come under the purview of CRZ regulations.
6	Water (Prevention and Control of Pollution) Act	1974	The Subprojects require consent to establish from the State Pollution Control Board if it involves discharge waste water from labor camps which is applicable during construction phase of the project. Contractors will be required to obtain discharge permits to ensure proper handling of wastewater from labor camps.
7	Air (Prevention and Control of Pollution) Act	1981	The project requires consent to establish from the State Pollution Control Board if it involves operation and Diesel Generator Sets. Contractors will be required to obtain consent to establish before start of civil works.
8	Noise Pollution Regulation and Control Act	1990	The project requires consent to establish from the State Pollution Control Board if the noise level from the construction machinery and the vehicles are above the standards.

	Acts and Rules	Year	Compliance Criteria
			Contractors will be required to obtain consent to establish before start of civil works.
9	Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013 (Act 30 of 2013), GoI	2013	This act will be applicable in case land is being acquired for the project road. This act will not be applicable as no land acquisition is required for the project development. The project is being developed on TTDC owned land.
10	Ancient Monuments and Archaeological Sites and Remains Act	1958	This act is applicable is case of any chance finds during construction phase of the project which may be remains/ monuments which are deemed to be protected by ASI or the State Directorate of Archaeology. This act will not be applicable as no archaeological sites are affected because of the project development. However, provision has been made so that chance found ancient properties are protected.
11	The Hazardous Wastes (Management, Handling andTran boundary movement) Rules	1989 2003 2008	These rules will be applicable if contractors during construction phase will store and handle hazardous material such as high speed diesel (HSD) and paints etc. But, the EMP spells out that all such materials will be procured from licensed depots and consumed immediately so storage is ruled out
12	The Explosives Act (and Rules)	1884	This Act specifies regulations regarding the use of explosives and precautionary measures while blasting and quarrying. Provisions of these rules are not applicable to this subproject as materials will be procured from third party licensed holders.

38. Further, during project execution influx of workmen from other states is anticipated and considering the large number of workmen to be engaged in various activities, the applicable Acts that are binding on the contractor have been enumerated in Table 1.

39. Further, for sand, soil and stone quarrying, prior permission is to be obtained from the state authorities for the purpose. However, considering the project profile, it is preferred to procure materials from the licensed third-party owners.

40. Considering the kind and quantum of activities, it is envisaged that no borrow areas and quarry sites will be established as a part of activity / subproject. Raw materials will be procured from licensed quarry owners. Similarly, no crusher sites will be opened by the contractor. Also, no borrow area shall be made available by the Employer for this work. The arrangement for the source of supply of the material for the civil works shall be the sole responsibility of the Contractor.

41. The contractor need to use diesel generator sets for which the permission will be required under Air Act 1981.

42. No fuel storage is envisaged in this project and for construction purposes, the fuel shall be procured from the existing fuel outlets.

43. For labor accommodation, no labor camp will be established and for accommodation of labors nearby construction sites rented houses will be engaged by the contractor.

44. Considering the workforce to be mobilized during construction phase, the Contractor is expected to acquaint with all the latest applicable/binding Acts as listed in Appendix 2.

45. The table above indicates that the proposed subproject does not need to go through a full scale environmental assessment process; as the scale of impacts and categorization of the subproject components will not require consent/clearances from competent authorities. Therefore, any further approvals or clearances from the Government of India or GoTN are not envisaged. The ADB guidelines stipulate addressing environmental concerns, if any, of a proposed activity in the initial stages of project preparation. For this, the ADB guidelines categorizes the proposed components into categories (A, B, or C) to determine the level of environmental assessment required to address the potential impacts. The subproject has been categorized as B. Accordingly, this IEE has been prepared to address the potential impacts, in line with the recommended IEE content and structure for Category B projects.

IV. DESCRIPTION OF THE EXISTING ENVIRONMENT

A. Physical Environment

46. Alangudi has a plain terrain of alluvial soil consisting of sand, silt and clay. Vennar and Vettar, the tributaries of Cauvery are the major water bodies around the town. Surface water canals contribute 89% to irrigation, while the rest 11% is accounted by dug wells and tube wells. Paddy is the major crop while the others being black gram, green gram, ground nut and gingelly.

47. The subproject site is located on the banks of the Vegavathy river. The subproject site is a barren land in the possession of the Department of HR&CE not requiring any land acquisition. No protected species have been recorded in this site. No natural or critical habitats being impacted by the subproject and no loss of biodiversity. Site is located in or immediately adjacent to habitats altered for human use (open yards, existing facilities, roadsides, pathways, etc.). Civil works are limited on existing structures.

48. Vedaranyam is a town in Nagapattinam district in the Indian state of Tamil Nadu. The town is named after the presiding deity of the Vedaranyeswarar Temple. The recorded history of Vedaranyam is known from medieval Chola period of the 9th century and has been ruled, at different times, by the Medieval Cholas, Later Cholas, Later Pandyas, Vijayanagar Empire and the British. During India's independence struggle, C. Rajagopalachari, who later became independent India's first Governor-General, launched a salt march in Vedaranyam parallel to the Dandi March launched by Gandhi in 1930 to protest against the sales tax levied on salt extraction.

49. The town is administered by the Vedaranyam municipality, which covers an area of 36.26 sq km. As of 2011, the town had a population of 34,266. Vedaranyam was a part of Thanjavur District till 1991 and Nagapattinam District henceforth. The town is a part of the fertile Cauvery delta region, but salt extraction and prawn cultivation are the major occupations.

Roadways are the major mode of transportation to Vedaranyam and the nearest Airport is Tiruchirapalli Airport, located 135 km (84 mi) away from the town. Vedaranyam is named after Vedaranyeswarar, the presiding deity of the Vedaranyeswarar Temple, a Hindu temple dedicated to Shiva. The place was earlier known as "Tirumaraikadu", meaning the place where Vedas, oldest scriptures of Hinduism, originated. The 7th century Saiva canonical work Tevaram by Appar and Tirugnanasambandar mentions the place as "Tirumaraikadu". As per Hindu legend, the Vedas worshipped Shiva in this place, giving the name "Vedaranyam" to the place.

1. Climate

50. Mean average temperature recorded for summer season was 31.3°C with mean maximum temperature of 36.1°C and mean minimum of 27.4°C. The mean average humidity recorded was 66.5% with mean maximum humidity of 81.5% and mean minimum of 48.0%. Mean average wind speed was observed to be 3.0 km/hour.

51. The Nagapattinam district receives rainfall under the influence of both southwest and northeast monsoon. A good part of the rainfall occurs as very intensive storms resulting mainly from cyclones generated in the Bay of Bengal especially during northeast monsoon. The district receives rainfall almost throughout the year. Rainfall data analysed (period 190170) shows the normal annual rainfall of the district is 1230 mm. The rainfall pattern in the district shows interesting features. Annual rainfall, which is 1500 mm at Vedaranyam, the southeast corner of the district, rapidly decreases to about 1100 mm towards west of the district. The district enjoys humid and tropical climate with hot summers, significant to mild winters and moderate to heavy rainfall. The temperatures varies from 40.6 to 19.3° C with sharp fall in night temperatures during monsoon period. The relative humidity ranges from 70 – 77% and it is high during the period of October to November.

2. Geographical features

52. The town is located at 10.8328° N, 79.4071° E at a distance 27 kilometers from the Bay of Bengal.

53. Vedaranyam has an average elevation of 1 m above MSL and is located on the Coramandel coast of Bay of Bengal. The Vedaranyam swamp is located parallel to the Palk Strait for 48 km.

3. Accessibility

54. The nearest airport to Alangudi is Civil Airport (TRZ) at Tiruchirappalli, Tamil Nadu, which is 58 km away from Alangudi and is 108 km away from Madurai Airport (IXM), Madurai, Tamil Nadu. Thanjavar Railway Station is about 32 km from Alangudi. There are frequent bus services to and from Chennai, Cuddalore, Pondicherry, Tiruchirappalli, Vellankanni, and Nagapttinam.

55. Vedaranyam municipality has within its jurisdiction 102.5 km of roads: 2.05 km of cement roads, 58.85 km of bituminous roads, 8.7 km of WBM roads and 32.9 km of earthern roads. The municipality maintains a bus stand that accommodates local as well as long distance buses. Bus is the primary mode of public transport from the town. The nearest railway station is located at Thiruthuraipoondi Junction, located 35 km away from the town. The nearest Airport is Tiruchirapalli Airport, located 135 km away from Vedaranyam.

4. Geomorphology

56. Thiruvarur district is a plain terrain with a gentle slope towards east in the northern and central parts and towards south in the southern part. The maximum surface elevation is about 30 m a msl in the western part of the district.

57. The prominent geomorphic units identified in the district through interpretation of Satellite imagery are: (i) deltaic plain, (ii) pediment and buried pediment, (iii) natural levee-swale, (iv) lagoon/backwater coastal plain, and (v) beach and beach ridges.

58. Major part of the district including Valangaiman, Nannilam, Thiruvarur and part of Thiruthuraipoondi taluks is occupied by delta plain. Sedimentary high land having pediment and buried pediment landforms are observed in Mannargudi and Needamangalam taluks. Sedimentary plain consisting various landforms like natural levee, swale and marshy area, lagoon/back water coastal plain and beach ridges are seen in the southern part of the district.

59. Vedaranyam municipality has within its jurisdiction 102.5 km of roads: 2.05 km of cement roads, 58.85 km of bituminous roads, 8.7 km of WBM roads and 32.9 km of earthern roads. The municipality maintains a bus stand that accommodates local as well as long distance buses. Bus is the primary mode of public transport from the town. The nearest railway station is located at Thiruthuraipoondi Junction, located 35 km away from the town. The nearest Airport is Tiruchirapalli Airport, located 135 km away from Vedaranyam.

5. Soil

60. Alangudi has mainly alluvial soil consisting of sand, silt and clay.

61. Vedaranyam has a tropical climate and the average temperature is 27°C. The total annual rainfall varies from 1000 to 1500mm with a dry period of 5-6 months.The major part of the district is covered by black clay and isolated patches of brown clay loam in the area bordering the NE boundary of Karaikal Region is seen. Some patches of Arenacious soils are also found along the coastal line.

6. Hydrogeology

62. The entire Thiruvarur district is covered by semi-consolidated formations consisting of sand, silt and clays (Plate-II). Ground water occurs under water table, semi-confined and confined conditions. The important aquifer systems in the district are: (i) Lower Miocene deeper aquifers, and (ii) Pliocene Quaternary shallow aquifers. The Lower Miocene Deeper Aquifers are the deeper aquifer system which can be divided into two hydraulically interconnected aquifers namely; (i) Lower Orathanadu aquifer zone, and (ii) the upper of main flowing aquifer zone.

63. The entire Nagapattinam district covered by semi-consolidated formations consisting of sand, silt and clays (Plate-II). Ground water occurs under water table, semi-confined and confined conditions. The important aquifer systems in the district are i) Lower Miocene deeper aquifers and ii) Pliocene – Quaternary shallow aquifers.

7. Groundwater Quality

64. Ground water in phreatic aquifer in Thiruvarur district, in general, is colorless, odorless and slightly alkaline in nature. The specific electrical conductance of ground water in phreatic (in Micro Seimens/centimeter at 25º C) during May 2007 was in the range 620 (Alankottai) to 4400 (Muthupetai) in the district. It is between 750 and 2250 µs/cm at 25º C in the major part of the district, whereas, conductance exceeding 2250 µs/cm at 25º C has been observed in parts of Muthupetai block.

65. It is observed that the ground water is suitable for drinking and domestic uses, in general, and all the constituents are within the permissible limits for domestic use, except at Muthupetai where Chloride is found to be in excess of the permissible limit, with regard to irrigation suitability based on specific electrical conductance and Sodium Absorption Ratio (SAR). It is observed, that the phreatic aquifer in a major part of the district has medium to high salinity. It is recommended that proper soil management strategies may be adopted.

66. Ground water in phreatic aquifers in Nagapattinam district, in general, is colourless, odourless and predominantly alkaline in nature. In more than 50% of the samples, pH value is >8.00. The specific electrical conductance of groundwater in the phreatic zone during May 2006 was in the range of 714 to 3640 micro Siemens at 25° C, in the district. Conductance below 750 has been observed only in select pockets of the district. Saline ground waters (EC>10,000) are observed at southern part of the district.

67. It is observed that the ground water is suitable for drinking and domestic uses in respect of all the constituents except total hardness and nitrate. The hardness as CaCO3 as well as nitrate is observed to be in excess of permissible limits of drinking water standard of BIS. The incidence of high total hardness is attributed to the composition of litho units constituting the aquifers in the district, whereas nitrate pollution is most likely due to the use of fertilizers for agriculture and other improper waste disposal practices.

8. Natural Disaster / Hazard

68. According to GSHAP data, the state of Tamil Nadu falls mostly in a region of low seismic hazard with the exception of western border areas that lie in a low to moderate hazard zone. Puducherry lies in a low hazard region. As per the 2002 Bureau of Indian Standards (BIS) map, Tamil Nadu and Puducherry fall in Zones II and III. Historically, parts of this region have experienced seismic activity in the M5.0 range.

9. Ambient Air and Noise Quality

69. The air environment of the subproject areas is generally found to be good and is free from industrial pollution. The ambient air quality in Alangudi, Thiruvarur District & Vedaranyam is perceived to be within acceptable standards. However, in absence of baseline ambient air quality data, it has been proposed to conduct pre-construction phase air quality monitoring and twice every year subsequently for the entire construction period. Impacts on air quality (if any) during construction stage are due to operation of various construction equipment and transport vehicles. Consequently, although emissions of common air contaminants (CAC) and fugitive dust may be elevated in proximity to the active work sites, this impact will be of short-term and localized to the immediate vicinity of the project site.

70. Greenhouse gas (GHG) emissions may increase as a result of project activities (i.e., vehicle and equipment operation, concrete production, disposal of excavated material, land filling of residual wastes). Given the subproject's relatively minor contribution to CAC and GHG emissions during construction, the overall significance rating of both these potential residual effects is considered to be negligible during construction.

71. Most of the subproject area is in a quiet environment. Noise intensive industrial operations are not observed in the project influence area. Present ambient noise levels, both in the day and night time, are perceived to be well within permissible levels. However, in absence of baseline ambient air quality data, it has been proposed to conduct pre-construction phase air quality monitoring and twice every year subsequently for the entire construction period.

72. Noise levels in the immediate proximity of most work sites are expected to increase during construction. The duration of this exposure will be relatively brief. This exposure represents temporary, localized, adverse residual effect of low to moderate significance for affected receptors. While building damage due to ground vibrations is unlikely, there may be annoyance to spatially located receptors during construction. Noise levels associated with the subproject operations will be largely imperceptible as civil works will be confined in relatively small sites within the district proper.

73. Since the subproject will be built in existing infrastructure, it will not conflict with existing or planned land use. However, traffic management concerns will occur spatially during construction. Site-specific mitigation measures will be implemented during construction to address temporary disruptions to land use, limitations on access to roads, sidewalk closures, traffic delays and detours, parking modifications, and increased volumes of construction–related traffic. There should be improved traffic movement along the access routes once construction is completed. During operations of the improved infrastructure and services, added residential developments, commercial and business facilities and increased densities are expected to develop and enhance the subproject area. This can be considered a long-term cumulative benefit of the subproject. (Refer Environmental Management plan for Subproject Specific impacts and their mitigation measures).

74. No adverse residual effects to human health will occur as a result of subproject construction or operation. While exposure to elevated noise levels and fugitive dust and CAC emissions will occur in proximity to subproject work sites during construction, due to their short term, localized nature, these effects are expected to be minor and insignificant with no measurable effects on human health. The subproject operations will benefit the general public by contributing to the long-term improvement of tourism in Tamil Nadu and livelihood opportunities to the local people.

B. Socio-economic and Cultural Environment

1. Trade and Commerce

75. Presently, the economy is solely dependent on tourism business and competition from other towns and other states has altered the potentials of the town leading to reduced growth rates and inflow of floating population.

2. Administration

76. The District of Thiruvarur was carved out as a separate district by detaching Valangaiman Taluk from Thanjavur District on 01.01.1997. There are 2 Revenue Divisions, 7 Taluks, 10 Blocks, 4 Municipalities and 7 Town Panchayats in Thiruvarur District. Thiruvarur was promoted to a first-grade municipality in 1978. The municipality has 30 wards and there is an elected councilor for each of those wards. The functions of the municipality are devolved into six departments: general administration/personnel, engineering, revenue, health, town planning and information technology (IT). All these departments are under the control of a municipal commissioner who is the executive head. The legislative powers are vested in a body of 30 members, one each from the 30 wards. The legislative body is headed by an elected Chairperson assisted by a Deputy Chairperson.

77. Vedaranyam is administered by a second grade municipality. It was originally declared a third grade municipality on 28 August 2004 and promoted to a second grade municipality on 9 August 2010.The municipality has 21 wards and there is an elected councilor for each of those wards. The municipality has 3 revenue villages namely Vedaranyam, Thoputhurai and Agasthyanpalli. The functions of the municipality are devolved into five departments: General administration, Engineering, Revenue, Public Health and Town planning. All these departments are under the control of a Municipal Commissioner who is the supreme executive head. The legislative powers are vested in a body of 21 members, one each from the 21 wards. The legislative body is headed by an elected Chairperson assisted by a Deputy Chairperson.

78. Important places to visit in Thiruvarur:

(i) **Arulmigu Abathsagayeswarar Temple**. Alangudi is the holy abode of Jupiter and a divine place where one could propitiate Jupiter and it is a place where Lord Guru can be propitiated in the form of Sri Dakshinamurthy. The Arulmigu Abathsagayeswarar Temple at Alangudi, is well known for its unique natural environment, spiritual and traditional rituals. The Hindu way of life flows undisturbed and this is why pilgrims are attracted to the temple. Alangudi is renowned for its 'Triglories' i.e. Moorthy (The Presiding Deity), Sthalam (Place of divinity) and Theertham (The Holy Water). Lakhs of people throng this place, particularly on the day of Jupiter's transit to the next sign. Maximum number of tourists visit this temple in the months of March, April, May, October, November and December. The tourist inflow nearly 15,00,000 per annum.

(ii) **Muthupettai Mangrove Forest / Lagoon (70 km)**. also called as the Alaiyathi Kadu, one of the largest of its kind located between Thirutturaipoondi and Pattukkotai. Paminiyaru, Koraiyaru, Kilai thaangi yaaru, Marakka koraiyaru; all these rivers form a lagoon before ending up at Kodiakarai [point calimere]. The lagoon is 8 kms from Muthupet in an area of 120 sq.km. Palanjur, Thamarankottai, Maravakkadu, Vadakadu, Thuraikadu and Muthupet reserve forests are the composition of mangrove forests. The collection of trees includes Thandal, Thillai, Narikanthal, Neermulli and so on. A 162 mts wooden causeway built across, provides an opportunity for a closer look at the mangrove forests. Variety of Migratory birds from Europe, Asia and Middle East flock to this area during season. It is a holistic, exotic and refreshing holiday option for nature lovers.

(iii) **Vaduvur Bird Sanctuary (26 km)**. It is 25 kms from Thanjavur and 30 kms from Thiruvarur. Vaduvur Bird Sanctuary is located in the Vaduvur Lake area and was created in the year 1999. More than 20,000 birds of 40 different species of water birds visits this place during the season. The sanctuary has basic facilities for

tourists to stay overnight and watch the birds from the two watch towers available here.

(iv) **Mannargudi (22 km)**. This is also called as Rajamannargudi. It is said that Mannargudi Temple and Temple tank are two inseparable and beautiful features of the town. Kulothunga Cholan Vinnagaram or the Rajagopalaswamy temple is called as the King of Temples. Here, Lord Vishnu is called as Rajagopalan or Rajamannar. The 24 shrines, 18 vimanams, 16 majestic towers, 7 splendid big halls and a 154 ft towering Rajagopuram are the special features of this large temple complex.

(v) **Udayamarthandapuram Bird Sanctuary (58 km)**. It is a 45 km² protected area in the District of Tiruvarur. It was created in 1998 and more than 10,000 migratory Birds visit here during monsoon season. Notable among them are Painted Storks, Herons and Open Bill Storks. Best suitable months to visit this sanctuary are November, December, February and March.

(vi) **Muthupettai Dargah (59 km)**: The seven hundred year old dargah here has many glorious aspects and traditional background. This dargah known as Andavar Shahul Dawood Khamil Oliyullh was built in Marattah style Architecture. Pilgrims beyond the barriers of Caste, creed and religion visit this holy Islamic place of worship.

(vii) The city of temples has a lot more historically famous and architecturally rich temples to visit. Thiruvarur - World Heritage Monument: The Thyagarajaswami Temple, dedicated to Lord Siva is located here. The biggest Temple Car [Chariot] called as “Aazhi Ther” in Tamil, is a specimen of magnificent workmanship and its beauty is still an attraction to many millions of pilgrims. The Car Festival of the temple is celebrated during March-April, every year. Kamalalayam Tank adjacent to the temple in a 25 acres area, is one of the largest temple tanks in the State. Muthupettai fulfills the blessings of Nature and the presence of Bird Sanctuaries in Udhayamarthandapuram and vaduvur attracts the tourist in large numbers. You can have a perfect holiday and have a great time enjoying the wealth of architectural expertise the ancestors possessed.

79. Important places to visit in Nagapattinam:

(i) The Vedaranyeswarar temple, an ancient Hindu temple dedicated to Shiva, is located in Vedaranyam.The temple has a shrine for Thyagaraja (a form of Shiva), known for "Hamsapthanathaanam", the dance pose similar to the gait of a swan.According to legend, a Chola king named Mucukunta obtained a boon from Indra (a celestial deity) to receive an image of Thyagaraja from the Hindu god Vishnu.Indra tricked the king with six other duplicate images, but the king chose the right image which was later installed at Thyagaraja Temple, Tiruvarur.The remaining six images were installed in Dharbaranyeswarar Temple, Kayarohanaswamy Temple, Kannayariamudayar Temple, Brahmapureeswarar Temple, Vaimoornaathar Temple and Tiruvarur Thyagaraja Temple.All seven Thyagaraja images are believed to possess different dance styles and the temples are classified as Saptha Vidangam, meaning temples with the seven dance moves.The twin festivals celebrated during the full moon days of Tamil month Adi (July – August) and Thai (January – February) attract large number of pilgrims from whole of Tamil Nadu. Pilgrims take a holy dip in the seashore round the year and the holy dip is considered similar to the worship practises at Rameswaram.

(ii) The Salt Sathyagraga Memorial Stupe built in memory of the salt march during India's independence movement is another prominent landmark in Vedaranyam.

The tourist destinations around the town are Ayurvedic Medicinal Forest, Point Calimere Wildlife and Bird Sanctuary located Point Calimere at a distance of 10 km , Historical Light House, Ramar Paatham, Ettukudi Murugan temple located at a distance of 40 km and Our Lady of Good Health, Velankanni located at a distance of 37 km from the town.

3. Area Population

80. Alangudi is a village with 650 families residing as per Population Census 2011and has a population of 2541 of which 1228 are males while 1313 are females. Average Sex Ratio of Alangudi village is 1069 which is higher than Tamil Nadu state average of 996. In 2011, literacy rate of Alangudi village was 85.72 % compared to 80.09 % of Tamil Nadu. In Alangudi village, Schedule Caste constitutes 36.64 % of total population. In Alangudi village out of total population, 1088 were engaged in work activities. Of 1088 workers engaged in Main Work, 135 were cultivators (owner or co-owner) while 486 were Agricultural labors.

81. According to 2011 census, Vedaranyam had a population of 34,266 with a sex-ratio of 1,068 females for every 1,000 males, much above the national average of 929.A total of 3,261 were under the age of six, constituting 1,711 males and 1,550 females. Scheduled Castes and Scheduled Tribes accounted for 14.91% and .2% of the population respectively. The average literacy of the town was 77.86%, compared to the national average of 72.99%.The town had a total of : 8665 households. There were a total of 12,694 workers, comprising 835 cultivators, 912 main agricultural labourers, 98 in house hold industries, 3,440 other workers, 7,409 marginal workers, 421 marginal cultivators, 2,277 marginal agricultural labourers, 175 marginal workers in household industries and 4,536 other marginal workers.

4. Languages

82. In addition to the Tamil language, English, Urdu are also spoken by the local People. Due to its proximity to the neighboring states and it being a popular tourist spot, English, Kannada and Malayalam are also spoken and understood to an extent.

83. In addition to the Tamil language, English, Due to its proximity to the neighbouring states and it being a popular tourist spot, English, Kannada and Malayalam are also spoken and understood to an extent.

5. Sanitation and Sewage Disposal

84. The current sewerage system for disposal of sullage is through septic tanks and public conveniences. The same shall be maintained for this site.

6. Solid Waste Management

85. No formal collection system from the municipality is present. The solid waste is being dumped in dump yards and / or is being incinerated in the open.

86. Vedaranyam Town Panchayat manages to collect nearly 6 metric tonnes of solid waste every day. The workers collect the waste using handcarts and tricycles and store it in dustbins and dumper bins for secondary collection. The waste being collected by tractors and tippers from various localities is disposed of by open dumping yard nearby.

7. Site Details

87. The site is free from encumbrances and is freely available with the Government of Tamil Nadu. Further, there is no necessity of any utility shifting and cutting of trees. The DSC has carried out a field visit and has interacted with the in-charge of the site. Table 2 is applicable to both the sites. While, the figures 4(a) & 4(b) below show the proposed site plans of Alangudi and Vedaranyam respectively.

Table 2: Site Details

	Description	**Yes / No**
1	Protected area	No
2	Archaeological site	No
3	Forest area	No
4	CRZ area	No

Notes: Protected Area includes wildlife sanctuary, bird sanctuary, or national park; CRZ=Coastal Regulation Zone.

Figure 4(a): Site Layout - Alangudi

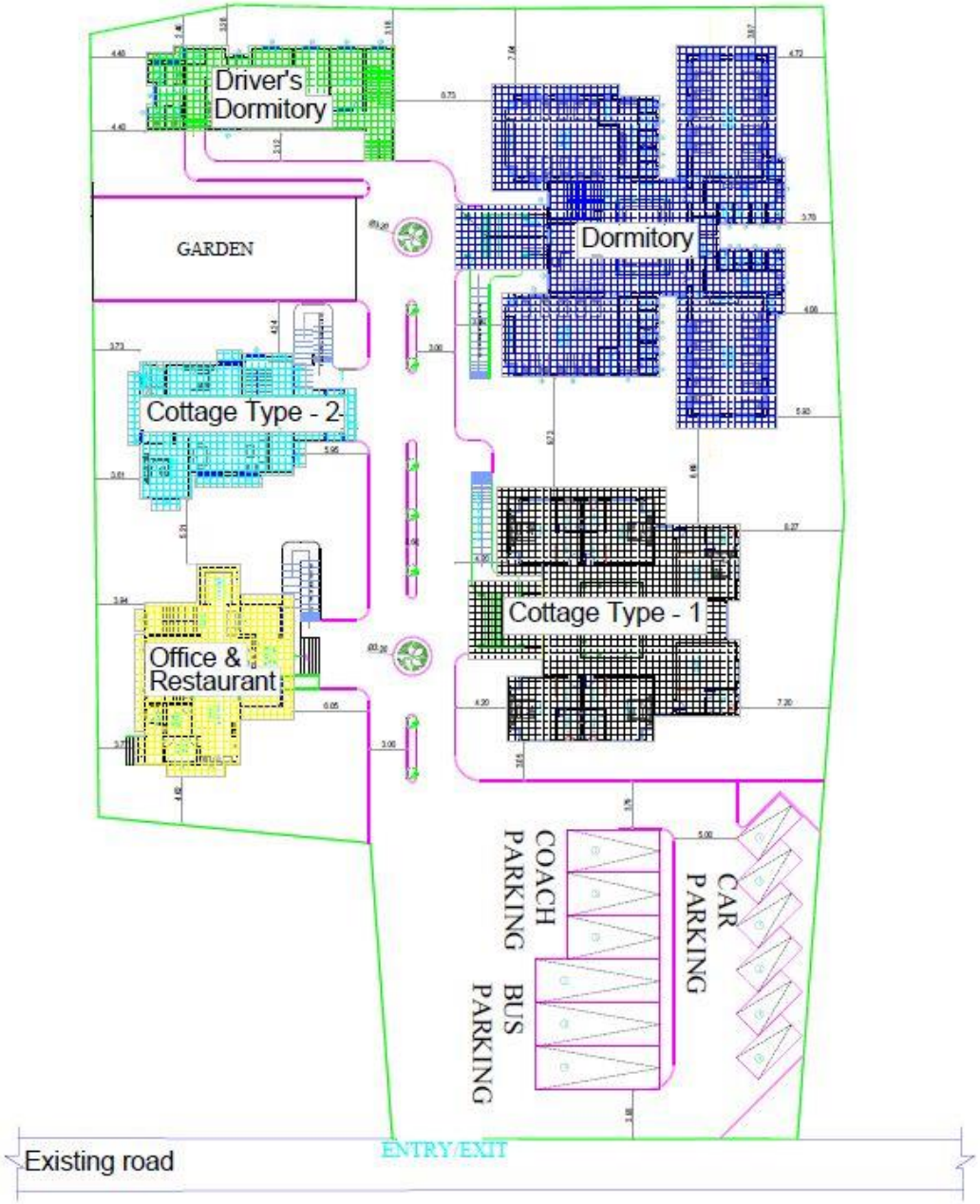
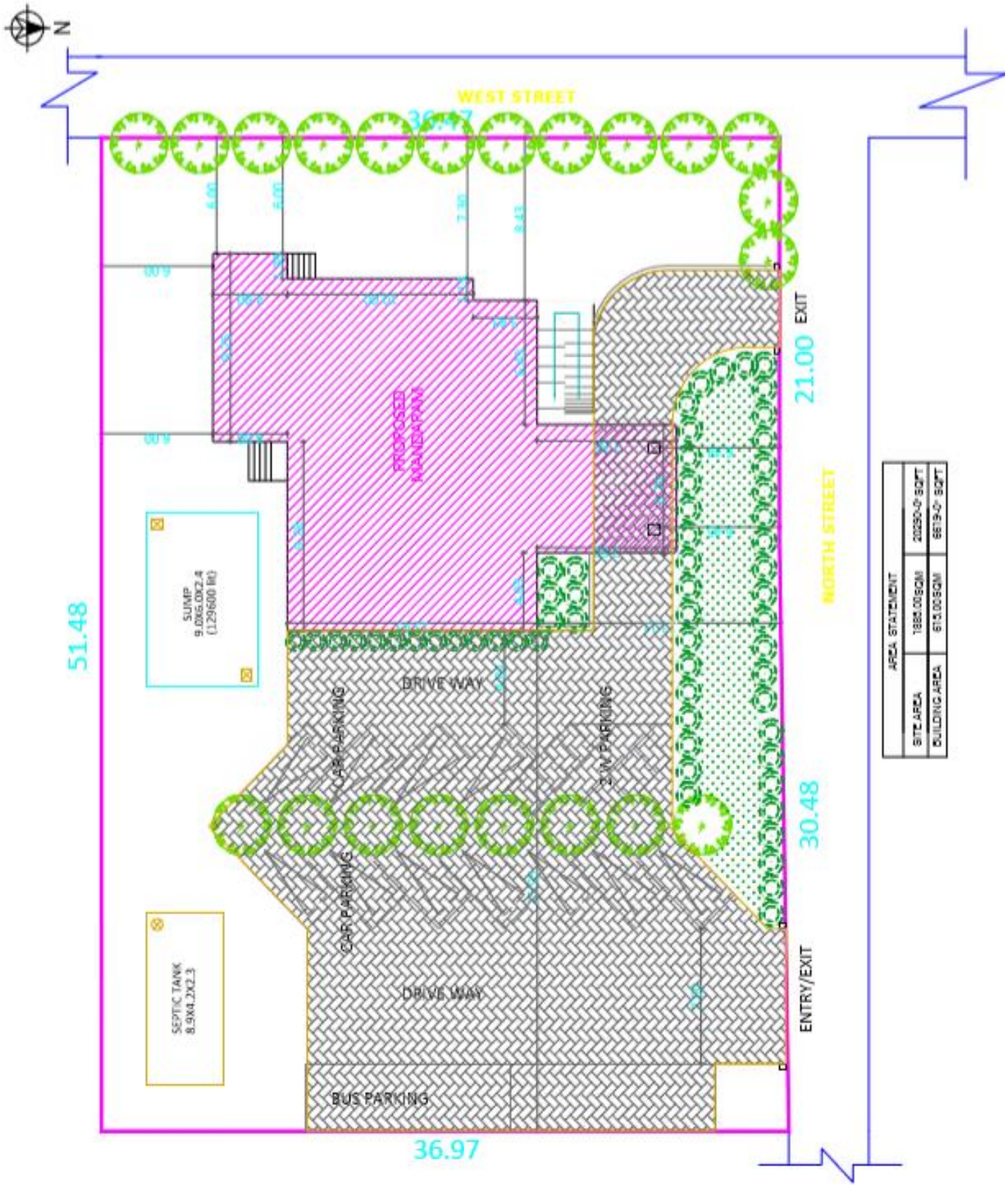


Figure 4(b): Site Layout - Vedaranyam



V. ENVIRONMENTAL IMPACTSAND MITIGATION MEASURES

88. The assessment for each of the subprojects has been carried out for potential impacts during the following stages of the project planning and implementation:

(i) Location impacts. Impacts associated with site selection, including impacts on environment and resettlement or livelihood related impacts on communities;
(ii) Design impacts. Impacts arising from project design, including the technology used, scale of operations, discharge standards, etc.;
(iii) Construction impacts. Impacts resulting from construction activities including site clearance, earthworks, civil works, etc.; and
(iv) O&M impacts. Impacts associated with the operation and maintenance of the infrastructure built in the project.

89. The proposal envisages medium scale construction activity onsite. The total built-up area proposed for the project site is 4,520 m^2. This would result in some environmental impacts typical to building construction activity.

(i) Requisite permissions will be obtained before commencement of construction works on site. Identity cards and vehicle permits shall be provided by the contractor for all such movement to and from the site.
(ii) Other impacts related to construction activities such as generation of dust and noise, removal of construction debris and demolition wastes are anticipated. These shall be minimized and addressed by adopting safe engineering practices and appropriate building design. Caution will be exercised in planning for safe construction and operations phase to minimize disturbance to the adjoining existing activities.
(iii) Relocation of an existing manhole on site and fire hydrant shall be required at the time of execution of works.
(iv) Provision for water for construction will be made through tankers or collected rain water so as not to burden the existing Municipal water demand at the hotel.

90. **Land Acquisition and Resettlement**. The proposed subproject locations are within the lands available with the HR&CE Department of Tamil Nadu. There are no impacts anticipated on land acquisition or resettlement due to the proposed subproject components.

91. The locations considered for the subproject are within the areas designated for tourism support infrastructure development as part of developing Tamil Nadu's conservation, heritage, natural and cultural attractions, and are outside areas demarcated for habitat protection and conservation. The proposed infrastructure will not impact any environmentally-sensitive or protected areas. Rather, it will enhance the tourism experience and livelihood of the local people in total. The public, government and local bodies are very much keen into taking up these proposed works. This proposal suggests areas which do not trigger impacts. No non-titled street vendors are in the area. No displacement or shifting of non-titled street vendors will take place in the identified sites for subproject.

92. **Design Consideration to Avoid Environmental Impacts**. The following are design considerations to avoid environmental impacts:

(i) Incorporation of adequate drainage provisions;
(ii) Adoption of design compatible with the natural environment and suitable selection of materials to enhance the aesthetic appeal and blend with the natural surroundings.

(iii) Straight lines and simple geometry in the proposed landscape and architectural features.
(iv) Use of subtle colors and simple ornamentation in the structures.
(v) Natural tree species in the proposed landscape.
(vi) Use of local stone in the proposed walkways and built structures thus maintaining a rustic architectural character.

A. Assessment of Environmental Impacts

93. Determination of Area of Influence. The primary impact areas are (i) sites for proposed project components; (ii) main routes/intersections which will be traversed by construction vehicles; and (ii) quarries and borrow pits as sources of construction materials. The secondary impact areas are: (i) entire town area outside of the delineated primary impact area; and (ii) entire Alangudi district in terms of over-all environmental improvement.

94. In the case of this subproject the components will involve straight forward construction and operation, and impacts will be mainly localized, short in duration and expected only during construction period.

B. Pre-construction Impacts and Mitigation Measures

95. **Consents, permits, clearances, no objection certificate (NOC), etc**. Failure to obtain necessary consents, permits, NOCs, etc. can result to design revisions and/or stoppage of works.

96. **Mitigation measures**. The following will be conducted during detailed design phase:
(i) Obtain all necessary consents, permits, clearance, NOCs, etc. prior to start of civil works.
(ii) Acknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs, etc.
(iii) Include in detailed design drawings and documents all conditions and provisions if necessary

97. **Erosion control.** Most of the impacts will occur due to excavation and earth movements during construction phase. Prior to commencement of civil works, the contractor will be required to:
(i) Develop an erosion control and re-vegetation plan to minimize soil loss and reduce sedimentation to protect water quality.
(ii) Minimize the potential for erosion by balancing cuts and fills to the extent feasible.
(iii) Identify and avoid areas with unstable slopes and local factors that can cause slope instability (groundwater conditions, precipitation, seismic activity, slope angles, and geologic structure).
(iv) Minimize the amount of land disturbed as much as possible. Use existing roads, disturbed areas, and borrow pits and quarries when possible. Minimize vegetation removal. Stage construction to limit the exposed area at any one time.

98. **Utilities**. Interruption of services (water supply, toilets, bathing areas, etc.) will be scheduled and intermittently related to localized construction activities. To mitigate impacts, PIU/DSC will:

(i) Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during the construction phase.
(ii) Require contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services.
(iii) Require contractor to obtain from the PIU and/or DSC the list of affected utilities and operators;
(iv) If relocations are necessary, contractor along with PIU/DSC will coordinate with the providers/line agencies to relocate the utility.

99. **Social and cultural resources**. There is a risk that any work involving ground disturbance can uncover and damage archaeological and historical remains. Although no such sites have been identified. For this subproject, excavation will occur in and around existing sites, ROWs and specified government land so no risk is foreseen to these structures. Nevertheless, the PIU/DSC will:

(i) Consult Archaeological Survey of India and/or State Department of Archaeology to obtain an expert assessment of the archaeological potential of the site.
(ii) Consider alternatives if the site is found to be of medium or high risk.
(iii) Include state and local archaeological, cultural and historical authorities, and interest groups in consultation forums as project stakeholders so that their expertise can be made available.
(iv) Develop a protocol for use by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognized, and measures are taken to ensure they are protected and conserved.

100. **Sites for construction work camps and areas for stockpile, storage and disposal**. The contractor will be required to meet the following criteria for the sites:

(i) Will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems, etc.
(ii) Residential areas will not be considered so as to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution and dust, and noise, and to prevent social conflicts, shortages of amenities, and crime).
(iii) Disposal will not be allowed near sensitive areas which will inconvenience the community.
(iv) The construction camp, storage of fuel and lubricants should be avoided at the river bank. Any construction camp site will be finalized in consultation with DSC and PIU.

101. **Sources of construction materials**. Significant amounts of gravel, sand, and cement will be required for this subproject. Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution. The contractor will be required to:

(i) Use quarry sites and sources permitted by government.
(ii) Verify suitability of all material sources and obtain approval from PIU/DSC.
(iii) If additional quarries are required after construction has started, obtain written approval from PIU/DSC.
(iv) Submit to PIU/DSC on a monthly basis documentation of sources of materials.

102. It will be the construction contractor’s responsibility to verify the suitability of all material sources and to obtain the approval of PIU/DSC. If additional quarries are required after construction is started, then the contractor obtains written approval of PIU.

103. **Access**. Hauling of construction materials and operation of equipment on-site can cause traffic problems and conflicts in ROWs. Construction traffic will access most work areas from the existing roads therefore potential impacts will be of short-duration, localized and can be mitigated. The contractor will need to adopt the following mitigation measures:

(i) Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites.
(ii) Schedule transport and hauling activities during non-peak hours.
(iii) Locate entry and exit points in areas where there is low potential for traffic congestion.
(iv) Keep the site free from all unnecessary obstructions.
(v) Drive vehicles in a considerate manner.
(vi) Coordinate with the Traffic Police Department for temporary road diversions and for provision of traffic aids if transportation activities cannot be avoided during peak hours.
(vii) Notify affected sensitive receptors by providing sign boards with information about the nature and duration of construction works and contact numbers for concerns/complaints.
(viii) Provide free access to households and businesses/shops along the ROWs during the construction phase.

104. Summary of pre-construction activities is presented in Table 3. The responsibilities, monitoring program and costs are provided in detail in the EMP. The contractor is required to update the information during detailed design phase. Sample waste/spoils management plan, traffic management plan, etc. are attached as Appendix 4.

Table 3: Summary of Pre-Construction Mitigation Measures

Parameters	Mitigation Measures
Consents, permits, clearances, no objection certificate (NOC), etc.	• Obtain all necessary consents, permits, clearance, NOCs, etc. prior to start of civil works. • Acknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs, etc. • Include in detailed design drawings and documents all conditions and provisions if necessary
Erosion control	• Develop an erosion control and re-vegetation plan to minimize soil loss and reduce sedimentation to protect water quality. • Minimize the potential for erosion by balancing cuts and fills to the extent feasible. • Identify and avoid areas with unstable slopes and local factors that can cause slope instability (groundwater conditions, precipitation, seismic activity, slope angles, and geologic structure). • Minimize the amount of land disturbed as much as possible. Use existing roads, disturbed areas, and borrow pits and quarries when possible. Minimize vegetation removal. Stage construction to limit the exposed area at any one time.
Utilities	• Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during the construction phase. • Require contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services. • Obtain from the Project Implementation Unit (PIU) and/or design and supervision consultant (DSC) the list of affected utilities and operators; • Prepare a contingency plan to include actions to be done in case of

Parameters	Mitigation Measures
	unintentional interruption of services. • If relocations are necessary, contractor will coordinate with the providers to relocate the utility.
Social and Cultural Resources	• Consult Archaeological Survey of India or State Department of Archaeology to obtain an expert assessment of the archaeological potential of the site. • Consider alternatives if the site is found to be of medium or high risk. • Include state and local archaeological, cultural and historical authorities, and interest groups in consultation forums as project stakeholders so that their expertise can be made available. • Develop a protocol for use by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved.
Sites for construction work camps, areas for stockpile, storage and disposal	• Will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems, etc. • Residential areas will not be considered so as to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution and dust, and noise, and to prevent social conflicts, shortages of amenities, and crime). • Disposal will not be allowed near sensitive areas which will inconvenience the community. • The construction camp, storage of fuel and lubricants should be avoided at the river bank. The construction camp site for intake well should be finalized in consultation with DSC and PIU.
Sources of construction materials	• Use quarry sites and sources permitted by government. • Verify suitability of all material sources and obtain approval from PIU/DSC. • If additional quarries are required after construction has started, obtain written approval from PIU/DSC. • Submit to DSC on a monthly basis documentation of sources of materials.
Access	• Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites. • Schedule transport and hauling activities during non-peak hours. • Locate entry and exit points in areas where there is low potential for traffic congestion. • Keep the site free from all unnecessary obstructions. • Drive vehicles in a considerate manner. • Coordinate with the Traffic Police Department for temporary road diversions and for provision of traffic aids if transportation activities cannot be avoided during peak hours. • Notify affected sensitive receptors by providing sign boards with information about the nature and duration of construction works and contact numbers for concerns/complaints. • Provide free access to households and businesses/shops along ROWs during the construction phase.

C. Anticipated Construction Impacts and Mitigation Measures

105. The impacts during the construction of the car parking, convention center and renovation of hotel are generic to the construction activities and not expected to be significant. The EMP specifies the necessary mitigation measures to be strictly followed by the contractor and supervised by the DSC. Key impacts during construction are envisaged on the following aspects: (i) transportation of materials, (ii) dust generation, air and noise from construction activities, (iii) handling of construction materials at site and, (iv) adoption of safety measures

during construction.

106. Construction Schedule and Method. Per preliminary design, construction activities will cover approximately 18 months. The exact implementation schedule will be updated during detailed design phase and will be reflected in this IEE.

107. The infrastructure will be constructed manually according to design specifications. Trenches will be dug by backhoe digger, supplemented by manual digging where necessary. Excavated soil will be placed nearby. Demolished materials will be reused to the maximum extent possible. Materials will be brought to site by trucks and will be stored on unused areas within the temple complexes and nearby vacant areas. Any excavated road will be reinstated. The working hours will be 8 hours daily, the total duration of each stage depends on the soil condition and other local features. Night works may be considered in commercial areas and high day-time traffic as per prevailing conditions at the time of construction.

108. There is sufficient space for a staging area, construction equipment, and stockpiling of materials. However, the contractor will need to remove all construction and demolition wastes on a daily basis.

109. Although construction of these project components involves quite simple techniques of civil work, the invasive nature of excavation and the subproject sites in built-up areas where there are a variety of human activities, will result to impacts to the environment and sensitive receptors such as residents, businesses, and the community in general. These anticipated impacts are short-term, site-specific and within relatively small areas.

110. **Erosion Hazards**. The sites are in the built-up area of the town therefore risk of erosion is low, limited during construction activities and not expected to have any negative impact on the drainage and hydrology of the area. Runoff will produce a highly variable discharge in terms of volume and quality, and in most instances, will have no discernible environmental impact. The contractor will be required to:

(i) Save topsoil removed during excavation and use to reclaim disturbed areas, as soon as it is possible to do so.
(ii) Use dust abatement such as water spraying to minimize windblown erosion.
(iii) Provide temporary stabilization of disturbed/excavated areas that are not actively under construction.
(iv) Apply erosion controls (e.g., silt traps) along the drainage leading to the water bodies.
(v) Maintain vegetative cover within road ROWs to prevent erosion and periodically monitor ROWs to assess erosion.
(vi) Clean and maintain catch basins, drainage ditches, and culverts regularly.
(vii) Conduct routine site inspections to assess the effectiveness of and the maintenance requirements for erosion and sediment control systems.

111. **Impacts on Water Quality**. Excavated materials may end up in drainages and water bodies adjacent to the subproject sites, particularly during monsoon season. Other risks of water pollution may be caused by: (i) poorly managed construction sediments, wastes and hazardous substances; and (ii) poor sanitation practices of construction workers. The contractor will be required to:

(i) Schedule civil works during non-monsoon season, to the maximum extent possible.

(ii) Ensure drainages and water bodies within the construction zones are kept free of obstructions.
(iii) Keep loose soil material and stockpiles out of drains, flow-lines and watercourses.
(iv) Avoid stockpiling of excavated and construction materials (sand, gravel, cement, etc.) unless covered by tarpaulins or plastic sheets.
(v) Re-use/utilize, to maximum extent possible, excavated materials.
(vi) Dispose any residuals at identified disposal site (PIU/DSC will identify approved sites).
(vii) Dispose waste oil and lubricants generated as per provisions of Hazardous Waste (Management and Handling) Rules, 1989.
(viii) Develop a spill prevention and containment plan, educate workers about the plan, and have the necessary materials on site prior to and during construction.
(ix) Refuel equipment within the designated refuelling containment area away from drainages, nallahs, or any water body.
(x) Inspect all vehicles daily for fluid leaks before leaving the vehicle staging area, and repair any leaks before the vehicle resumes operation.

112. **Impacts on Air Quality**. There is potential for increased dust particularly during summer/dry season due to stockpiling of excavated materials. Emissions from vehicles transporting workers, construction materials and debris/materials to be disposed may cause increased in air pollutants within the construction zone. These are inherent impacts which are site-specific, low magnitude, short in duration and can be easily mitigated. The contractor will be required to:

(i) Conduct regular water spraying on earth piles, trenches and sand piles.
(ii) Conduct regular visual inspection along alignments and construction zones to ensure no excessive dust emissions.
(iii) Spreading crushed gravel over backfilled surfaces if re-surfacing of disturbed areas cannot be done immediately.
(iv) Maintain construction vehicles and obtain “pollution under control” certificate from TNSPCB.
(v) Obtain consent for establishment (CFE) and consent for operation (CFO) for hot mix plants, crushers, diesel generators, etc., if to be used in the project.

113. **Noise and Vibration Impacts**. Noise and vibration-emitting construction activities include earthworks, rock crushing, concrete mixing, movement and operation of construction vehicles and equipment, and loading and unloading of coarse aggregates. The significance of noise and vibration impacts will be high in areas where noise-sensitive institutions such as health care and educational facilities are situated. These impacts will be temporary, short-term, intermittent, and expected to be in the range of 80 to 100 dB(A) as per Table 4 (typical noise levels of principal construction equipment).

Table 4: Typical Noise Levels of Principal Construction Equipment

Clearing		**Structure Construction**	
Bulldozer	80	Crane	75-77
Front end loader	72-84	Welding generator	71-82
Jack hammer	81-98	Concrete mixer	74-88
Crane with ball	75-87	Concrete pump	81-84
		Concrete vibrator	76
EXCAVATION and EARTH MOVING		Air compressor	74-87
Bulldozer	80	Pneumatic tools	81-98

Backhoe	72-93	Bulldozer	80
Front end loader	72-84	Cement and dump trucks	83-94
Dump truck	83-94	Front end loader	72-84
Jack hammer	81-98	Dump truck	83-94
Scraper	80-93	Paver	86-88
GRADING AND COMPACTING		LANDSCAPING AND CLEAN-UP	
Grader	80-93	Bulldozer	80
Roller	73-75	Backhoe	72-93
		Truck	83-94
PAVING		Front end loader	72-84
Paver	86-88	Dump truck	83-94
Truck	83-94	Paver	86-88
Tamper	74-77	Dump truck	83-94

Source: U.S. Environmental Protection Agency. Noise from Construction Equipment and Operations. Building Equipment and Home Appliances. NJID. 300.1. December 31. 1971

114. The contractor will be required to:

(i) Limit construction activities in temple complexes and other important sites to daytime only.

(ii) Plan activities in consultation with the PIU/DSC so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance.

(iii) Minimize noise from construction equipment by using vehicle silencers and fitting jackhammers with noise-reducing mufflers.

(iv) Avoid loud random noise from sirens, air compression, etc.

(v) Require drivers that horns not be used unless it is necessary to warn other road users or animals of the vehicle's approach.

(vi) If specific noise complaints are received during construction, the contractor may be required to implement one or more of the following noise mitigation measures, as directed by the project manager:

(vii) Locate stationary construction equipment as far from nearby noise-sensitive properties as possible.

(viii) Shut off idling equipment.

(ix) Reschedule construction operations to avoid periods of noise annoyance identified in the complaint.

(x) Notify nearby residents whenever extremely noisy work will be occurring.

(xi) Follow Noise Pollution (Regulation and Control) Rules, day time ambient noise levels should not exceed 65 dB(A) in commercial areas, 55 dB(A) in residential areas, and 50 dB(A) in silence zone.3

(xii) Ensure vehicles comply with Government of India noise limits for vehicles. The test method to be followed shall be IS:3028-1998.

115. **Impacts on Flora and Fauna**. As per preliminary design, tree-cutting is not required. This will be reassessed during detailed design phase. Though there are no protected areas in the direct and indirect impact zones and no diverse ecological biodiversity is found within project area but, there is an existing aviary in close proximity to the south being managed by the TN Forest Department. Therefore, mitigation measures are required to protect these birds from impacts of construction works. To safeguard the interest of this facility and because of its

[3] Day time shall mean from 6.00 am to 10.00 pm. Silence zone is an area comprising not less than 100 meters around hospitals, educational institutions, courts, religious places or any other area which is declared as such by TNSPCB. Mixed categories of areas may be declared as one of the above-mentioned categories by TNSPCB.

recreation value for the tourists, it is proposed to take adequate noise and sound insulation features in the proposed building to prevent the internal noise from reaching outside and causing any disturbance. This is also recommended to prevent disturbance to resident visitors at the adjoining hotel and guest house accommodation at Peterhoff. In general, the contractor will be required to:

(i) Conduct site induction and environmental awareness.
(ii) Limit activities within the work area.
(iii) Replant trees in the area using minimum ratio of 2 new trees for every 1 tree cut, if any. Replacement species must be approved by District Forest Department.
(iv) Provide sound barriers towards the Aviary site and restrict noisy activities in day time only and use silencers/mufflers in noise producing equipment.
(v) Impacts on Physical and Cultural Resources. There may be inconvenience to tourists, residents, businesses, and other road users due to construction activities in the temple complexes and slower flow of traffic in areas with narrow roads. This potential impact is site-specific, short-term and can be mitigated. The contractor will be required to:
(vi) Ensure no damage to structures/properties near construction zone.
(vii) Provide walkways and metal sheets where required to maintain access of people and vehicles.
(viii) Provide sign boards to inform nature and duration of construction works and contact numbers for concerns/complaints.
(ix) Increase the workforce in front of critical areas such as institutions, place of worship, business establishment, hospitals, and schools;
(x) Implement good housekeeping. Remove wastes immediately. Prohibit stockpiling of materials that may obstruct/slow down pedestrians and/or vehicle movement.
(xi) Ensure workers will not use nearby/adjacent areas as toilet facility.
(xii) Coordinate with DSC for transportation routes and schedule. Schedule transport and hauling activities during non-peak hours. Communicate road detours via visible boards, advertising, pamphlets, etc.
(xiii) Ensure heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites.
(xiv) Provide instructions on event of chance finds for archaeological and/or ethno-botanical resources. Works must be stopped immediately until such time chance finds are cleared by experts.

116. **Impact due to Waste Generation**. Demolished structures will be reused to the maximum extent possible. Construction activities will produce excess excavated soils, excess construction materials, and solid wastes (such as removed concrete, wood, trees and plants, packaging materials, empty containers, oils, lubricants, and other similar items). These impacts are negative but short-term and reversible by mitigation measures. The contractor will need to adopt the following mitigation measures:

(i) Prepare and implement a waste management plan.
(ii) Manage solid waste according to the following hierarchy: reuse, recycling and disposal. Include in waste management plan designated/approved disposal areas.
(iii) Coordinate with Municipal Authorities for beneficial uses of excavated soils/silts/sediments or immediately dispose to designated areas.
(iv) Recover used oil and lubricants and reuse; or remove from the sites.
(v) Avoid stockpiling and remove immediately all excavated soils, excess construction materials, and solid waste (removed concrete, wood, trees and

plants, packaging materials, empty containers, oils, lubricants, and other similar items).

(vi) Prohibit disposal of any material or wastes (including human waste) into drainage, nallah, or watercourse.

117. Impacts on Occupational Health and Safety. Residential accommodation for workers is not proposed. Workers need to be mindful of occupational hazards which can arise from excavation works in high-traffic and busy areas. Exposure to work-related chemical, physical, biological and social hazard is typically intermittent and of short duration, but is likely to reoccur. Potential impacts are negative and long-term but reversible by mitigation measures. Overall, the contractor should comply with IFC Environmental, Health and Safety (EHS) Guidelines on Occupational Health and Safety (this can be downloaded from (http://www1.ifc.org/wps/wcm/connect/9aef2880488559a983acd36a6515bb18/2%2BOccupational%2BHealth%2Band%2BSafety.pdf?MOD=AJPERES). The contractor will be required to:

(i) Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.

(ii) Develop comprehensive site-specific health and safety (H&S) plan. The overall objective is to provide guidance to contractors on establishing a management strategy and applying practices that are intended to eliminate, or reduce, fatalities, injuries and illnesses for workers performing activities and tasks associated with the project.

(iii) Include in H&S plan measures such as: (i) type of hazards during excavation works; (ii) corresponding personal protective equipment for each identified hazard; (iii) H&S training for all site personnel; (iv) procedures to be followed for all site activities; and (v) documentation of work-related accidents.

(iv) Provide H&S orientation training to all new workers to ensure that they are apprised of the rules of work at the site, personal protective protection, and preventing injury to fellow workers.

(v) Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site as well as at construction camps.

(vi) Provide medical insurance coverage for workers.

(vii) Secure construction zone from unauthorized intrusion and accident risks.

(viii) Provide supplies of potable drinking water.

(ix) Provide clean eating areas where workers are not exposed to hazardous or noxious substances.

(x) Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted.

(xi) Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas.

(xii) Ensure moving equipment is outfitted with audible back-up alarms.

(xiii) Mark and provide sign boards in the construction zone, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate.

118. **Impacts on Socio-Economic Activities**. Manpower will be required during the 24 months construction phase. This can help generate contractual employment and increase in local revenue. Thus, potential impact is positive and long-term. As per preliminary design, land

acquisition and closure of roads are not required. However, construction activities may impede access of residents and customers to shops. The potential impacts are negative and moderate but short-term and temporary. The contractor will need to adopt the following mitigation measures:

(i) Leave space for access between mounds of soil.
(ii) Provide walkways and metal sheets where required to maintain access to shops/businesses along trenches.
(iii) Consult businesses and institutions regarding operating hours and factoring this in to work schedules.
(iv) Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.
(v) Employ at least 50% of the labor force, or to the maximum extent, local persons within the 2-km immediate area if manpower is available.

119. **Summary of Mitigation Measures during Construction**. Table 5 provides summary of mitigation measures to be considered by the contractor during construction phase. The detailed mitigation measures, environmental monitoring and reporting requirements, emergency response procedures, related implementation arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators are provided in the EMP.

Table 5: Summary of Mitigation Measures during Construction Phase

Potential Impact	Mitigation Measures
Erosion hazards	• Save topsoil removed during excavation and use to reclaim disturbed areas, as soon as it is possible to do so. • Use dust abatement such as water spraying to minimize windblown erosion. • Provide temporary stabilization of disturbed/excavated areas that are not actively under construction. • Apply erosion controls (e.g., silt traps) along the drainage leading to the water bodies. • Maintain vegetative cover within road right-of-ways (ROWs) to prevent erosion and periodically monitor ROWs to assess erosion. • Clean and maintain catch basins, drainage ditches, and culverts regularly. • Conduct routine site inspections to assess the effectiveness of and the maintenance requirements for erosion and sediment control systems.
Impacts on water quality	• Schedule civil works during non-monsoon season, to the maximum extent possible. • Ensure drainages and water bodies within the construction zones are kept free of obstructions. • Keep loose soil material and stockpiles out of drains, flow-lines and watercourses. • Avoid stockpiling of excavated and construction materials (sand, gravel, cement, etc.) unless covered by tarpaulins or plastic sheets. • Re-use/utilize, to maximum extent possible, excavated materials. • Dispose any residuals at identified disposal site (PIU/DSC will identify approved sites). • Dispose waste oil and lubricants generated as per provisions of Hazardous Waste (Management and Handling) Rules, 1989. • Develop a spill prevention and containment plan, educate workers about the plan, and have the necessary materials on site prior to and during construction. • Refuel equipment within the designated refuelling containment area away from drainages, nallahs, or any water body.

Potential Impact	Mitigation Measures
	• Inspect all vehicles daily for fluid leaks before leaving the vehicle staging area, and repair any leaks before the vehicle resumes operation.
Impacts on air quality	• Conduct regular water spraying on earth piles, trenches and sand piles. • Conduct regular visual inspection along alignments and construction zones to ensure no excessive dust emissions. • Spreading crushed gravel over backfilled surfaces if re-surfacing of disturbed ROWs cannot be done immediately. • Maintain construction vehicles and obtain "pollution under control" certificate from TNSPCB. • Obtain CFE and CFO for hot mix plants, crushers, diesel generators, etc., if to be used in the project.
Noise and vibrations impacts	• Limit construction activities in temple complexes and other important sites to daytime only. • Plan activities in consultation with the PIU/DSC so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance. • Minimize noise from construction equipment by using vehicle silencers and fitting jackhammers with noise-reducing mufflers. • Avoid loud random noise from sirens, air compression, etc. • Require drivers that horns not be used unless it is necessary to warn other road users or animals of the vehicle's approach. • If specific noise complaints are received during construction, the contractor may be required to implement one or more of the following noise mitigation measures, as directed by the project manager: (i) locate stationary construction equipment as far from nearby noise-sensitive properties as possible; (ii) shut off idling equipment; (iii) reschedule construction operations to avoid periods of noise annoyance identified in the complaint; and/or (iv) notify nearby residents whenever extremely noisy work will be occurring. • Follow Noise Pollution (Regulation and Control) Rules, day time ambient noise levels should not exceed 65 dB(A) in commercial areas, 55 dB(A) in residential areas, and 50 dB(A) in silence zone.4 • Ensure vehicles comply with Government of India noise limits for vehicles. The test method to be followed shall be IS:3028-1998. • Provide sound barriers towards the Aviary site and restrict noisy activities in day time only
Impacts on flora and fauna	• Conduct site induction and environmental awareness. • Limit activities within the work area. • Replant trees in the area using minimum ratio of 2 new trees for every 1 tree cut, if any. Replacement species must be approved by District Forest Department • Provide sound barriers towards the Aviary site and restrict noisy activities in day time only and use silencers/mufflers in noise producing equipment.
Impacts on physical resources	• Ensure no damage to structures/properties near construction zone. • Provide walkways and metal sheets where required to maintain access of people and vehicles. • Provide sign boards to inform nature and duration of construction works and contact numbers for concerns/complaints. • Increase the workforce in front of critical areas such as institutions, place of worship, business establishment, hospitals, and schools;

[4] Day time shall mean from 6.00 am to 10.00 pm. Silence zone is an area comprising not less than 100 meters around hospitals, educational institutions, courts, religious places or any other area which is declared as such by TNSPCB. Mixed categories of areas may be declared as one of the above mentioned categories by TNSPCB.

Potential Impact	Mitigation Measures
	• Implement good housekeeping. Remove wastes immediately. Prohibit stockpiling of materials that may obstruct/slow down pedestrians and/or vehicle movement. • Ensure workers will not use nearby/adjacent areas as toilet facility. • Coordinate with PIU/DSC for transportation routes and schedule. Schedule transport and hauling activities during non-peak hours. Communicate road detours via visible boards, advertising, pamphlets, etc. • Ensure heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites. • Provide instructions on event of chance finds for archaeological and/or ethno-botanical resources. Works must be stopped immediately until such time chance finds are cleared by experts.
Impacts on waste generation	• Prepare and implement a waste management plan. Manage solid waste according to the following hierarchy: reuse, recycling and disposal. Include in waste management plan designated/approved disposal areas. • Coordinate with Municipal Authorities for beneficial uses of excavated soils/silts/sediments or immediately dispose to designated areas. • Recover used oil and lubricants and reuse; or remove from the sites. • Avoid stockpiling and remove immediately all excavated soils, excess construction materials, and solid waste (removed concrete, wood, trees and plants, packaging materials, empty containers, oils, lubricants, and other similar items). • Prohibit disposal of any material or wastes (including human waste) into drainage, nallah, or watercourse.
Impacts on occupational health and safety	• Comply with IFC EHS Guidelines on Occupational Health and Safety • Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively. • Develop comprehensive site-specific health and safety (H&S) plan. The overall objective is to provide guidance to contractors on establishing a management strategy and applying practices that are intended to eliminate, or reduce, fatalities, injuries and illnesses for workers performing activities and tasks associated with the project. • Include in H&S plan measures such as: (i) type of hazards during excavation works; (ii) corresponding personal protective equipment for each identified hazard; (iii) H&S training for all site personnel; (iv) procedures to be followed for all site activities; and (v) documentation of work-related accidents. • Provide H&S orientation training to all new workers to ensure that they are apprised of the rules of work at the site, personal protective protection, and preventing injury to fellow workers. • Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site as well as at construction camps. • Provide medical insurance coverage for workers. • Secure construction zone from unauthorized intrusion and accident risks. • Provide supplies of potable drinking water. • Provide clean eating areas where workers are not exposed to hazardous or noxious substances. • Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted. • Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas. • Ensure moving equipment is outfitted with audible back-up alarms. • Mark and provide sign boards in the construction zone, and areas for storage

Potential Impact	Mitigation Measures
	and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate.
Impacts on socio-economic activities	• Leave space for access between mounds of soil. • Provide walkways and metal sheets where required to maintain access to shops/businesses along trenches. • Consult businesses and institutions regarding operating hours and factoring this in to work schedules. • Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints. • Employ at least 50% of the labor force, or to the maximum extent, local persons within the 2-km immediate area if manpower is available. • "Mobility Plan" has to be chalked out in consultation with the District Administration prior to start of work.

120. The construction related impacts due to proposed subproject components are generic to construction activities and are typical of building and other construction projects. The potential impacts that are associated with construction activities can be mitigated to standard levels without difficulty through incorporation or application of the recommended mitigation measures and procedures.

D. Post-Construction Impacts and Mitigation Measures

121. Site clean-up is necessary after construction activities. The contractor will be required to:

(i) Backfill any excavation and trenches, preferably with excess excavation material generated during the construction phase.
(ii) Use removed topsoil to reclaim disturbed areas.
(iii) Re-establish the original grade and drainage pattern to the extent practicable.
(iv) Stabilize all areas of disturbed vegetation using weed-free native shrubs, grasses, and trees.
(v) Restore access roads, staging areas, and temporary work areas.
(vi) Restore roadside vegetation.
(vii) Remove all tools, equipment, barricades, signs, surplus materials, debris, and rubbish. Demolish buildings/structures not required for O&M. Dispose in designated disposal sites.
(viii) Monitor success of re-vegetation and tree re-planting. Replace all plants determined to be in an unhealthy condition.
(ix) Request in writing from PIU/DSC that construction zones have been restored.

E. Anticipated Operations and Maintenance Impacts and Mitigation Measures

122. Impacts on environmental conditions associated with the operations and maintenance (O&M) of the subproject components pertain to impacts related to increased tourists in the areas resulting to increased vehicular movement along the roads, increased demands for services, and increased solid waste generation. These impacts can be mitigated by:

(i) Increased vehicular movement along the roads - speed restrictions, provision of appropriate road signage and well-located rest points for pedestrians shall minimize impacts on safety of the people.
(ii) Increase demands for services – addressed through the subproject design.

(iii) Increase solid waste generation – Municipal Corporation to put in place solid waste management programs.

VI. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

A. ADB Disclosure Policy

123. Public consultation was undertaken as per ADB SPS requirements. All the five principles of information dissemination, information solicitation, integration, coordination and engagement into dialogue were incorporated during the task. A framework of different environmental impacts likely from the project was prepared based on opinions of all those consulted, especially at the micro level, by setting up dialogues with the local people and fishermen from whom information on site facts and prevailing conditions were collected.

124. As per ADB safeguard requirement, public consultation is to be carried out before and after impact identification. Public consultation was therefore carried out twice, once at the time of start of work with the key stakeholders particularly with wild life authorities and NGOs, and secondly to discuss mitigating measures and get concurrence of stakeholders.

B. Process for Consultation Followed

125. During project preparation, consultations have been held with the TN Department of Tourism, tourists of Alangudi and District administration, District Municipal Administration, local community representatives, tourism officers, and tourist guides/photographers regarding issues pertaining to the selection of subprojects and identification of key issues including addressing the current gaps in provision of basic services and improvement of tourist infrastructure. Records of the consultations are provided in Appendix 1.

C. Plan for Continued Public Participation

126. To ensure continued public participation[5], provisions to ensure regular and continued stakeholder participation, at all stages during the project design and implementation is proposed. A grievance redressal committee will be set up within the PIU to register grievances of the people regarding technical, social and environmental aspects. This participatory process will ensure that all views of the people are adequately reviewed and suitably incorporated in the design and implementation process. Further, to ensure an effective disclosure of the project proposals to the stakeholders and the communities in the vicinity of the subproject locations, an extensive project awareness campaigns will be carried out.

127. The implementing agency will submit to ADB the following documents for disclosure on ADB's website: (i) The final IEE; (ii) A new or updated IEE and corrective action plan prepared during project implementation, if any; and (iii) the environmental monitoring reports.

128. For the benefit of the community the Summary IEE will be translated in the local language (Tamil) and made available at: (i) Office of the PMU; and, (ii) Office of the District Collectors at the Alangudi, Thiruvarur District. These copies will be made available free of

[5] Meaningful consultation will: (i) be carried out on an ongoing basis throughout the project cycle; (ii) involve timely disclosure of relevant information. Affected peoples and stakeholders will have access to relevant project information prior to any decision-making that will affect them; (iii) be conducted free of intimidation or coercion; and (iv) be gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups.

cost to any person seeking information on the same. Hard copies of the IEE will be available in the PMU/PIU as well as the district library at Alangudi, Thiruvarur District, and accessible to citizens as a means to disclose the document and at the same time creating wider public awareness. On demand, the person seeking information can obtain a hard copy of the complete IEE document at the cost of photocopy from the office of the PMU/PIU, on a written request and payment for the same to the Project Director. Electronic version of the IEE will be placed in the official website of the Tourism Department and the website of ADB after approval of the documents by Government and ADB. The PMU will issue Notification on the disclosure mechanism in local newspapers, ahead of the initiation of implementation of the project, providing information on the project, as well as the start dates, etc. The notice will be issued by the PMU in local newspapers one month ahead of the implementation works. This will create awareness of the project implementation among the public.

129. Posters designed to mass campaign the basic tenets of the IEE will be distributed to libraries in different localities that will be generating mass awareness.

VII. GRIEVANCE REDRESS MECHANISM

130. The executing agency will establish a mechanism to receive and facilitate resolution of affected peoples' concerns, complaints, and grievances about the Project's environmental performance. The project-specific grievance redress mechanism (GRM) is not intended to bypass the government's own redress process; rather it is intended to address affected people's concerns and complaints promptly, making it readily accessible to all segments of the affected people and is scaled to the risks and impacts of the Project.

131. The PMU and PIUs will make the public aware of the GRM through public awareness campaigns. Grievances can be filed in writing using the Complaint Register and Complaint Forms (Appendix 5) or by phone with any member of the PMU or PIU. The contact phone number of the PIUs and the PMU will serve as a hotline for complaints and will be publicized through the media and placed on notice boards outside their offices and at construction sites. The safeguard documents made available to the public in an accessible version will include information on the GRM and will be widely disseminated throughout the corridor by the safeguards officers in the PMU and PIUs with support from the NGO engaged to implement the Community Awareness Program.

132. The PIUs will convene Grievance Redress Committees (GRCs) within one week of the voiced grievance at the project level consisting of members of local government, NGOs, project staff, and representatives of the affected people. Decisions on the grievance are to be made within 15 days voiced grievances. If the grievance cannot be solved, the PMU is notified to further advice on the situation with higher government and legal bodies.

133. The GRC will ensure rights of vulnerable and poor are included. The grievance mechanism will be scaled to the risks and adverse impacts of the Project. It will address affected people's concerns and complaints promptly, using an understandable and transparent process that is gender responsive, culturally appropriate, and readily accessible to all segments of the affected people at no costs and without retribution. The mechanism developed will be in a manner that it shall not impede access to the existing judicial or administrative remedies. The affected people will be appropriately informed about the mechanism.

134. The PMU officers will be responsible for processing and placing all papers before the GRC, maintaining database of complaints, recording decisions, issuing minutes of the meetings

and monitoring to see that formal orders are issued, and the decisions carried out. All costs involved in resolving the complaints (meetings, consultations, communication and reporting / information dissemination) will be borne by the PMU.

135. The safeguard monitoring reports will include the following aspects pertaining to progress on grievances:

(i) Number of cases registered with the GRC, level of jurisdiction (first, second and third tiers), number of hearings held, decisions made, and the status of pending cases; and

(ii) Lists of cases in process and already decided upon may be prepared with details such as Name, ID with unique serial number, date of notice, date of application, Date of hearing, decisions, remarks, actions taken to resolve issues, and status of Grievance (i.e., open, closed, pending).

136. The affected person/aggrieved party can give their grievance verbally or in written to the local grievances committee. Grievances of affected person will first be brought to the attention of the PIU who can resolve the issue at site level. If the matter is not solved within 7 days period by the PIU, it will be brought to the GRC constituted for the purpose in PIU. This GRC shall discuss the issue in its monthly meeting and resolve the issues within one month of time after receiving the grievance. If the matter is not resolved by GRC at PIU level within stipulated time, it shall be referred to GRC at PMU level by Executive Engineer of PIU.

137. GRC at PMU shall discuss the issue and try to resolve it and inform the PIU accordingly. If the matter is not resolved by the GRC at PMU level within one month of time, the aggrieved person/party can bring the matter to The Court of Law. The PIU shall keep records of all grievances received including contact details of complainant, date of receiving the complaint, nature of grievance, agreed corrective actions and the date these were affected and final outcome. The grievance redress process is shown below.

A. Composition and Functions of Grievance Redress Committee

138. Local Grievance Committee (LGC). In this LGC has worked with NGO, SHG, Line Agency, Special invitee.

139. GRC at PIU. In each PIU there shall be one GRC, which will include Project Manager (PIU), District Tourist Officer of Department of Tourism of Govt. of Tamil Nadu, Community Development Officer of PIU, nominated representative of District Magistrate and nominated representative committee shall be headed by Project Manager (PIU). The committee will meet at least once in every month. Agenda of meeting shall be circulated to all the members and affected persons/aggrieved party along with venue, date and time; informed in written at least 7 days in advance of meeting. The matters shall remain with GRC at PIU level for one month and if grievance is not resolved within this time period, the matter shall be referred to GRC at PMU.

140. GRC within Environmental and Social Management Cell (ESMC) at PMU. There shall be one GRC in PMU. The matters not resolved by the GRC at PIU level within one month shall come under GRC at PMU. GRC at PMU will include Community Development Expert of PMU, Safeguard Specialist of PMU and Additional Project Director (APD) of PMU. The Committee shall be headed by APD of PMU. This committee shall look the matters, which are referred to and not resolved by GRC at PIU level. If the matter is not resolved by the GRC at PMU level within one month of time, the aggrieved person/party can bring the matter to The Executive

Committee/State Level Empowered Committee (SLEC). Sample Grievance Redress Form is attached as Appendix 5.

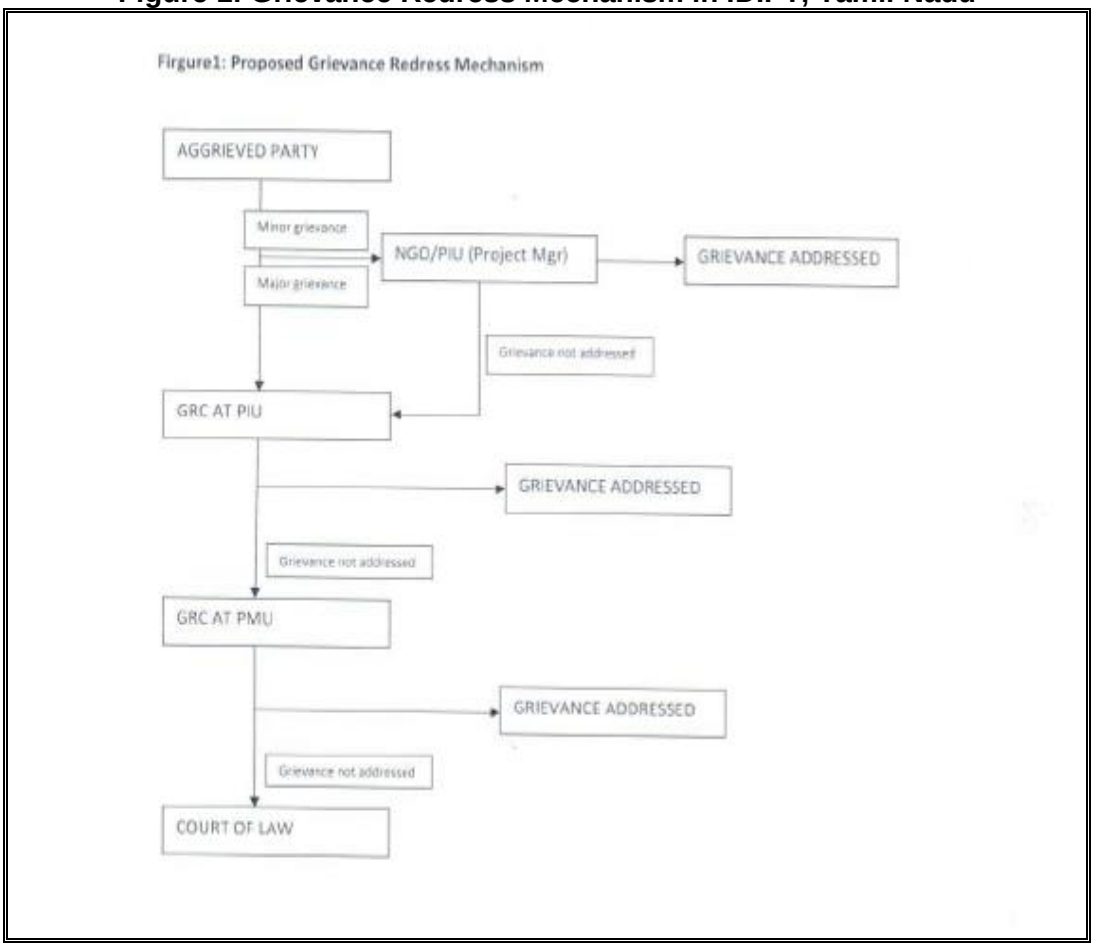
B. Approach to Grievance Redress Committee

141. Affected person/aggrieved party can approach to GRC for redress of his/their grievances through any of the following modes:

(i) **Web based:** A separate corner will be developed at the program website so that public / community/ affected person can register their complaint in the online column.

(ii) **Telecom based:** A toll free no. Will be issued by the PMU/ PIU so that general public can register their complaint through telephone / mobile phone to the PIU/PMU office.

Figure 1: Grievance Redress Mechanism in IDIPT, Tamil Nadu



Note: LGC -NGO, SHG, Line Agency, Representative of Gram Panchayat, Special invitee GRC – PM, CDO, Engineer, DFO, DTO, SDM GRC in Environment and Social Management Cell (ESMC) –PMU (APD, SS, CDS, FS), PMC (EE, CDE)

C. Accountability Mechanism

142. People who are, or may in the future be, adversely affected by the project may submit complaints to ADB's Accountability Mechanism. The Accountability Mechanism provides an independent forum and process whereby people adversely affected by ADB-assisted projects

can voice, and seek a resolution of their problems, as well as report alleged violations of ADB's operational policies and procedures. Before submitting a complaint to the Accountability Mechanism, affected people should make an effort in good faith to solve their problems by working with the concerned ADB operations department. Only after doing that, and if they are still dissatisfied, should they approach the Accountability Mechanism.[6]

VIII. ENVIRONMENTAL MANAGEMENT PLAN

143. The purpose of the environmental management plan (EMP) is to ensure that the activities are undertaken in a responsible, non-detrimental manner with the objectives of: (i) providing a proactive, feasible, and practical working tool to enable the measurement and monitoring of environmental performance on-site; (ii) guiding and controlling the implementation of findings and recommendations of the environmental assessment conducted for the project; (iii) detailing specific actions deemed necessary to assist in mitigating the environmental impact of the project; and (iv) ensuring that safety recommendations are complied with (Table 5).

144. A copy of the EMP must be kept on work sites at all times. This EMP will be included in the bid documents and will be further reviewed and updated during implementation. The EMP will be made binding on all contractors operating on the site and will be included in the contractual clauses. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

145. The contractor will be required to (i) establish an operational system for managing environmental impacts (ii) carry out all of the monitoring and mitigation measures set forth in the EMP; and (iii) implement any corrective or preventative actions set out in safeguards monitoring reports that PMU and PIU will prepare from time to time to monitor implementation of this IEE and EMP. The contractor shall allocate a budget for compliance with these EMP measures, requirements and actions.

A. Responsibilities for Environmental Management Plan Implementation

146. The following agencies will be responsible for EMP Implementation:

(i) Department of Tourism and Civil Aviation, H.P. is the executing agency responsible for overall management, coordination, and execution of all activities funded under the loan;

(ii) PIU, Alangudi will be the Implementing Agency (IA) responsible for coordinating procurement and construction of the project. PIU through its Project Management Unit (PMU) at Alangudi will be implementing the project;

(iii) The Project Management Consultant (PMC) assists PMU in managing the project including procurement and assures technical quality of design and construction;

(iv) The Design and Supervision Consultant (DSC) will prepare the DPR of the project and will carry out construction supervision during project implementation. Their responsibility will also include EMP implementation supervision;

(v) A Project Implementation Unit (PIU) shall be established in Alangudi. This PIU will look into progress and coordination of day to day construction works with the assistance of DSC; and

(vi) The contractor will be responsible for execution of all construction works. The contractor will work under the guidance of the PIU Alangudi and DSC. The

[6] Accountability Mechanism. http://www.adb.org/Accountability-Mechanism/default.asp.

environmental related mitigation measures will also be implemented by the contractor.

147. The contractor's conformity with contract procedures and specifications during construction will be carefully monitored by the PIU. Safeguard Specialists are deputed in PMU, PMC and DSC, who will monitor the environmental performance of contractors. Terms of References of Safeguards Specialists are given in boxes below:

Box 1: Terms of Reference of Safeguards Specialist – PMU

- Review the IEE document and ensure adequacy under Safeguard Policy Statement, 2009 and identify any areas for improvement.
- Ensure that the project design and specification adequately reflect the IEE, co-ordinate the obtaining of requisite environmental clearances for the project
- Monitor construction activities to ensure that identified and appropriate control measures are effective and in compliance with the IEE and advise PIU for compliance with statutory requirements.
- Develop training programme for the PMU/PIUs staff, the contractors and others involved in the project implementation, in collaboration with the Environmental Specialist of the PMC and DSC
- Review and approve the Contractor's Implementation Plan for the environmental measures, as per IEE.
- Liaise with the Contractors and Consultants on the implementation of the Environmental management measures proposed in the IEE
- Liaise with the various Government agencies on environmental and other regulatory matters
- Continuously interact with the NGOs and Community groups to be involved in the project
- Establish dialogue with the affected communities and ensure that the environmental concerns and suggestions are incorporated and implemented in the project.
- Review the environmental performance of the project through an assessment of the periodic environmental monitoring reports submitted by the DSC; provide a summary of the same to the Project Director, and initiate necessary follow-up actions
- Provide support and assistance to the Government Agencies and the Asian Development Bank to supervise the implementation of the IEE during the construction as well as operation stage of the project
- Document the good practices in the project on incorporation and integration of environmental issues into engineering design and on implementing measures in the construction, and dissemination of the same

Box 2: Terms of Reference of Safeguards Specialist (Environment) of DSC

- Review the IEE document and ensure adequacy under ADB SPS, 2009.
- Interact on a regular basis with the sector specialists of the DSC and integrate environmentally sound practices into the detailed design of project components.
- Advise PMU/PIU for compliance with statutory clearances.
- Work out the site specific mitigation measures for components as required and integrate the same into contractual provisions.
- Develop, organize and deliver environmental training programmes and workshops for the staff of the PIU and Contractors and in accordance to the Capacity Building Programme as specified in the IEE.
- Preparation of Activity Plans as identified in IEE (these include Site Management Plans,

Box 2: Terms of Reference of Safeguards Specialist (Environment) of DSC

Waste Management Plans, Sludge Management and Disposal Plans, Occupational Safety Plans etc.).

- Supervise the implementation of the Environmental provisions by the Contractors.
- Review and approve site specific environmental enhancement/mitigation designs worked out by the Contractor. Hold regular consultation meetings with the Environmental specialist of the PMU
- Review the Contractors' Environmental Implementation Plans to ensure compliance with the IEE.
- Develop good practice construction guidelines to assist the contractors in implementing the provisions of IEE.
- Prepare and submit regular environmental monitoring and implementation progress reports.
- Assist Environmental Specialist of the PMU to prepare good practice dissemination notes based on the experience gained from site supervision.

Box 3: Terms of Reference of Safeguards Specialist (Environment) of PMC

Support and Advice the PMU and Consultants team in-

- Best Environmental Practices for responding to environmental issues involved with implementation of the projects on a sustainable basis
- Assistance and advice on institutional strengthening and capacity building at the PMU and PIU levels in regards to environmental practices.
- Ensure that baseline surveys, environmental monitoring plans and programs, initial environmental examinations (IEE) as may be required are carried out.
- Preparation of ADB procedure compliant environmental safeguard actions including impact assessment if any during the design stage
- Management plan and mitigation measures
- Oversight of implementation of environmental standards and safeguards as part of project implementation
- Participate in preparation of Master Plan for additional sites and contribute to the environmental safeguards to the plan and sub components
- Preparation of performance monitoring reports

148. Responsibility for updating IEE during detailed design. DSC will be responsible for preparation of IEE and updating it time to time, when required during detailed design and implementation phase.

149. Responsibility for monitoring. During construction, DSC's Environmental Specialist and the designated representative engineer of the PIU will monitor the contractor's environmental performance on day to day basis while PMC expert will randomly monitor the performance for corrective measures if required. During the operation phase, monitoring will be the responsibility of the Municipal Authority and Department of Tourism.

150. Responsibility for Reporting. PIU in coordination with DSC will submit monthly, quarterly and semi-annually monitoring report to PMU. On the basis of it PMU will submit to ADB semi-annual monitoring reports on implementation of the EMP and will permit ADB to field environmental review missions which will review in detail the environmental aspects of the project. Any major accidents having serious environmental consequences will be reported immediately. PMC environmental expert will help in preparation and finalization of quarterly,

semi-annual and annual progress reports. The sample environmental monitoring template is attached as Appendix 4.

B. Environmental Management Plan Tables

151. Tables 6 to 8 show the potential adverse environmental impacts, proposed mitigation measures, responsible parties, and cost of implementation. This EMP will be included in the bid documents and will be further reviewed and updated during implementation.

Table 6: Pre-Construction Environmental Management Plan Table

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds to Implement Mitigation Measures
Consents, permits, clearances, no objection certificate (NOC), etc.	Obtain all necessary consents, permits, clearance, NOCs, etc. prior to start of civil works.	Consents, permits, clearance, NOCs, etc.	Project Management Unit (PMU)	Executing agency to report to ADB in environmental monitoring report (EMR)	check consent for establishments (CFEs), permits, clearance, prior to start of civil works	PMU
	Acknowledge in writing and provide report on compliance all obtained consents, permits, clearance, NOCs, etc.	Records and communications	PMU	Executing agency to report to ADB in EMR	Acknowledge upon receipt Send report as specified in consent for establishment (CFE), permits, etc.	PMU
	Include in detailed design drawings and documents all conditions and provisions if necessary	Detailed design documents and drawings	Contractor	PMU and PMC PIU and Design and Supervision Consultant	Upon submission by contractor	Contractor
Establishment of baseline environmental conditions prior to start of civil works	Conduct documentation of location of components, areas for construction zone (camps, staging, storage, stockpiling, etc.) and surroundings (within direct impact zones). Include photos and GPS coordinates	Records	Contractor	PMU and PMC PIU and DSC	to be included in updated Initial Environmental Examination (IEE) report	PMU
Erosion control	Develop an erosion control and re-vegetation plan to minimize soil loss and reduce sedimentation to protect water quality. Minimize the potential for	Erosion control and re-vegetation plan covering construction phase	Contractor	PMU and PMC PIU and DSC	to be included in updated IEE report	Contractor

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds to Implement Mitigation Measures
	erosion by balancing cuts and fills to the extent feasible. Identify and avoid areas with unstable slopes and local factors that can cause slope instability (groundwater conditions, precipitation, seismic activity, slope angles, and geologic structure). Minimize the amount of land disturbed as much as possible. Use existing roads, disturbed areas, and borrow pits and quarries when possible. Minimize vegetation removal. Stage construction to limit the exposed area at any one time. Minimize the amount of land disturbed as much as possible. Use existing roads, disturbed areas, and borrow pits and quarries when possible. Minimize vegetation removal. Stage construction to limit the exposed area at any one time.					
Utilities	Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during the construction phase. Require contractors to prepare a contingency plan to include actions to be done in case of	List and maps showing utilities to be shifted Contingency plan for services disruption	- DSC to prepare preliminary list and maps of utilities to be shifted - During detailed design phase, contractor to (i) prepare list and operators of	PMU and PMC PIU and DSC	to be included in updated IEE report	DSC – preliminary design stage Contractor – implementation stage

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds to Implement Mitigation Measures
	unintentional interruption of services. Obtain from the PIU and/or DSC the list of affected utilities and operators; If relocations are necessary, contractor will coordinate with the providers to relocate the utility.		utilities to be shifted; (ii) contingency plan			
Social and Cultural Resources	Consult Archaeological Survey of India (ASI) or TN State Archaeology Department to obtain an expert assessment of the archaeological potential of the site. Consider alternatives if the site is found to be of medium or high risk. Include state and local archaeological, cultural and historical authorities, and interest groups in consultation forums as project stakeholders so that their expertise can be made available. Develop a protocol for use by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved.	Chance find protocol	- PMC to consult ASI or TN State Archaeology Department - PMC to develop protocol for chance finds	PMU	to be included in updated IEE report	PMC
Sites for construction	Will not promote instability and result in destruction of property,	List of pre-approved sites for	- DSC to prepare list of potential	PMU	to be included in updated IEE	Contractor

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds to Implement Mitigation Measures
work camps, areas for stockpile, storage and disposal	vegetation, irrigation, and drinking water supply systems, etc. Residential areas will not be considered so as to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution and dust, and noise, and to prevent social conflicts, shortages of amenities, and crime). Disposal will not be allowed near sensitive areas which will inconvenience the community. The construction camp, storage of fuel and lubricants should be avoided at the river bank. The construction camp site for intake well should be finalized in consultation with DSC and PIU.	construction work camps, areas for stockpile, storage and disposal Waste management plan	sites DSC to inspect sites proposed by contractor if not included in pre-approved sites	PIU	report	
Sources of construction materials	Use quarry sites and sources permitted by government. Verify suitability of all material sources and obtain approval from PIU. If additional quarries are required after construction has started, obtain written approval from PIU. Submit to DSC on a monthly basis documentation of sources of materials.	Permits issued to quarries/sources of materials	Contractor PMC and DSC to verify sources (including permits) if additional is requested by contractor	PMU PIU	Upon submission by contractor	Contractor
Access	Plan transportation routes so that heavy vehicles do not use	Traffic management plan	Contractor	PIU and DSC	to be included in updated IEE	Contractor

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds to Implement Mitigation Measures
	narrow local roads, except in the immediate vicinity of delivery sites. Schedule transport and hauling activities during non-peak hours. Locate entry and exit points in areas where there is low potential for traffic congestion. Keep the site free from all unnecessary obstructions. Drive vehicles in a considerate manner. Coordinate with the Traffic Police Department for temporary road diversions and for provision of traffic aids if transportation activities cannot be avoided during peak hours. Notify affected sensitive receptors by providing sign boards with information about the nature and duration of construction works and contact numbers for concerns/complaints. Provide free access to households along the alignments of raw and clear water transmission routes during the construction phase.				report	
Occupational health and safety	Comply with IFC EHS Guidelines on Occupational Health and Safety Develop comprehensive site-	Health and safety (H&S) plan	Contractor	PMU and PMC PIU and DSC	to be included in updated IEE report	Contractor

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds to Implement Mitigation Measures
	specific health and safety (H&S) plan. The overall objective is to provide guidance to contractors on establishing a management strategy and applying practices that are intended to eliminate, or reduce, fatalities, injuries and illnesses for workers performing activities and tasks associated with the project. Include in H&S plan measures such as: (i) type of hazards in the intake wells site; (ii) corresponding personal protective equipment for each identified hazard; (iii) H&S training for all site personnel; (iv) procedures to be followed for all site activities; and (v) documentation of work-related accidents. Provide medical insurance coverage for workers.					
Public consultations	Continue information dissemination, consultations, and involvement/participation of stakeholders during project implementation.	- Disclosure records - Consultations	PMU and PMC PIU and DSC Temple administrators Contractor	PMU and PMC	- During updating of IEE Report -During preparation of site- and activity-specific plans as per EMP - Prior to start of construction - During construction	PMU Contractor to allocate funds to support

Table 7: Environment Management Plan for Construction Phase

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
Erosion hazards	• Save topsoil removed during excavation and use to reclaim disturbed areas, as soon as it is possible to do so. • Use dust abatement such as water spraying to minimize windblown erosion. • Provide temporary stabilization of disturbed/excavated areas that are not actively under construction. • Apply erosion controls (e.g., silt traps) along the drainage leading to the water bodies. • Maintain vegetative cover within road ROWs to prevent erosion and periodically monitor ROWs to assess erosion. • Clean and maintain catch basins, drainage ditches, and culverts regularly. • Conduct routine site inspections to assess the effectiveness of and the maintenance requirements for erosion and sediment control systems.	Erosion control and re-vegetation plan	Contractor	PIU and DSC PIU to submit EMP monitoring report to PMU	- daily visual inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent during monsoon season and if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	Contractor
Impacts on water quality	• Schedule construction activities during non-monsoon season, to the maximum extent possible.	Work schedule	Contractor	PIU and DSC PIU to submit EMP monitoring report to PMU	- daily inspection by contractor supervisor and/or environment specialist	
	• Ensure drainages and water bodies within the construction zones are kept free	Visual inspection				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	of obstructions.				- weekly visual inspection by DSC (more frequent during monsoon season and if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	
	• Keep loose soil material and stockpiles out of drains and flow-lines.	Visual inspection				
	• Avoid stockpiling of excavated and construction materials (sand, gravel, cement, etc.) unless covered by tarpaulins or plastic sheets.	Visual inspection				
	• Re-use/utilize, to maximum extent possible, excavated materials.	condition in waste management plan				
	• Dispose any residuals at identified disposal site (PIU/DSC will identify approved sites).	condition in waste management plan				
	• Dispose waste oil and lubricants generated as per provisions of Hazardous Waste (Management and Handling) Rules, 1989.	condition in waste management plan				
	• Refuel equipment within the designated refuelling containment area away from drainages, nallahs, or water body.	condition in list of pre-approved sites for construction work camps, areas for stockpile, storage and disposal				
	• Inspect all vehicles daily for fluid leaks before leaving the vehicle staging area, and repair any leaks before the vehicle resumes operation.	Vehicle inspection report				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
Impacts on air quality	• Conduct regular water spraying on stockpiles.	- Visual inspection - No complaints from sensitive receptors - Records	Contractor	PIU and DSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent during dry season and if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	Contractor
	• Conduct regular visual inspection in the construction zones to ensure no excessive dust emissions.	Visual inspection				
	• Maintain construction vehicles and obtain "pollution under control" certificate from TNSPCB.	PUC certificates				
	• Obtain CFE and CFO for hot mix plants, crushers, diesel generators, etc., if to be used in the project.	Consent to establish (CTE) and Consent to operate (CTO)				
Noise and vibrations impacts	• Limit construction activities in temple complexes and other important areas to daytime only. • Plan activities in consultation with PIU/DSC so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance.	Work schedule	Contractor	PIU and DSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent during noise-generating activities and if corrective	Contractors
	• Minimize noise from construction equipment by using vehicle silencers and fitting jackhammers with noise-reducing	Report on ambient noise level monitoring within direct impact zones				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	mufflers.				action is required) - random inspection by PMU, PIU, PMC and/or DSC	
	• Avoid loud random noise from sirens, air compression, etc.	zero incidence				
	• Require drivers that horns not be used unless it is necessary to warn other road users or animals of the vehicle's approach.	feedback from receptors within direct and direct impact zone				
	• If specific noise complaints are received during construction, the contractor may be required to implement one or more of the following noise mitigation measures, as directed by the project manager: • Locate stationary construction equipment as far from nearby noise-sensitive properties, such as the hospital, as possible. • Shut off idling equipment. • Reschedule construction operations to avoid periods of noise annoyance identified in the complaint. • Notify nearby residents whenever extremely noisy work will be occurring.	- Complaints addressed satisfactory - Grievance Redress Mechanicm (GRM) records				
Impacts on flora and fauna	• Conduct site induction and environmental awareness.	Records	Contractor	PIU and DSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by	Contractor
	• Limit activities within the work area.	Barricades along excavation works				
	• Replant trees in the area using minimum ratio of 2 new trees for every 1 tree cut. Replacement species must be approved by Chief Wildlife	-Number and species approved by Tamil Nadu State Forest Department				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	Warden of Tamil Nadu State Forest Department. • Provide sound barriers towards existing aviary and restrict noisy activities during day time only.	-Sound barriers installed towards aviary			DSC (more frequent if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	
Impacts on physical cultural resources	• Ensure no damage to structures/properties adjacent to construction zone.	- Visual inspection - any impact should be addressed by project resettlement plan	Contractor In coordination with PIU and DSC for any structures within WTP site and construction zone	PIU and DSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	Contractor
	• Provide sign boards to inform nature and duration of construction works and contact numbers for concerns/complaints.	- no complaints received - photo-documentation				
	• Increase the workforce in WTP components near the hospital and other sensitive receptors.	- Records of workers deployment - Work schedule				
	• Implement good housekeeping. Remove wastes immediately.	- Visual inspection - No stockpiled/ stored wastes				
	• Ensure workers will not use nearby/adjacent areas as toilet facility.	- No complaints received - Sanitation facilities for use of workers				
	• Coordinate with PIU/DSC for transportation routes and schedule. Schedule transport and	- Approved routes in traffic management plan				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	hauling activities during non-peak hours. Communicate road detours via visible boards, advertising, pamphlets, etc. • Ensure heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites.					
	• Provide instructions on event of chance finds for archaeological and/or ethno-botanical resources. Works must be stopped immediately until such time chance finds are cleared by experts.	condition in chance find protocol				
Impact due to waste generation	• Prepare and implement a waste management plan. Manage solid waste according to the following hierarchy: reuse, recycling and disposal. Include in waste management plan designated/approved disposal areas. • Coordinate with PIU/DSC for beneficial uses of excavated soils or immediately dispose to designated areas. • Recover used oil and lubricants and reuse; or remove from the site. • Avoid stockpiling and remove immediately all excavated soils, excess construction materials, and solid waste (removed concrete, wood, trees and plants, packaging materials, empty containers, oils, lubricants,	condition in waste management plan	Contractor	PIU and DSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	Contractor

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	and other similar items). • Prohibit disposal of any material or wastes (including human waste) into drainage, nallah, or watercourse.					
Impacts on occupational health and safety	• Comply with IFC Environmental, Health and Safety (EHS) Guidelines on Occupational Health and Safety (OHS)	- Visual inspection - Records	Contractor	PIU and DSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by DSC (more frequent if corrective action is required) - random inspection by PMU, PIU, PMC and/or DSC	Contractor
	• Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.	- Visual inspection - Work schedule - Noise level monitoring in work area				
	• Provide H&S orientation training to all new workers to ensure that they are apprised of the rules of work at the site, personal protective protection, and preventing injury to fellow workers.	- Records - Condition in Health and Safety (H&S) plan				
	• Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site as well as at construction camps.	- Visible first aid equipment and medical supplies - Condition in H&S plan				
	• Provide medical insurance coverage for workers.	Records				
	• Secure construction zone from unauthorized intrusion and accident risks.	- Area secured - Trenches barricaded				
	• Provide supplies of potable drinking water.	- Supply of water				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	• Provide clean eating areas where workers are not exposed to hazardous or noxious substances.	- Workers area				
	• Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted.	- Records - Condition in H&S plan				
	• Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas.	- Visual inspection - Condition in H&S plan				
	• Ensure moving equipment is outfitted with audible back-up alarms.	- Construction vehicles - Condition in H&S plan				
	• Mark and provide sign boards in the construction zone, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate.	- Visible and understandable sign boards in construction zone - H&S plan includes appropriate signs for each hazard present				
Impacts on socio-economic activities	• Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.	Visible and understandable sign boards in construction zone	Contractor	PIU and DSC	- daily inspection by contractor supervisor - weekly visual inspection by DSC (more frequent if	Contractor
	• Employ at least 50% of the labor force, or to the maximum	Employment records				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	extent, local persons within the 2-km immediate area if manpower is available.				corrective action is required) - random inspection by PMU, PIU, PMC	

Table 8: Environmental Management Plan for Post-Construction Phase

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
Solid waste (debris, excavated soils, etc.)	• Backfill any excavation and trenches, preferably with excess excavation material generated during the construction phase. • Use removed topsoil to reclaim disturbed areas. • Re-establish the original grade and drainage pattern to the extent practicable. • Stabilize all areas of disturbed vegetation using weed-free native shrubs, grasses, and trees. • Restore access roads, staging areas, and temporary work areas. • Restore roadside vegetation, if removed • Remove all tools, equipment, barricades, signs, surplus materials, debris, and rubbish. Demolish buildings/structures not required for O&M. Dispose in designated disposal sites. • Monitor success of re-	Pre-existing condition Construction zone has been restored	Contractor	PIU and DSC PIU to submit EMP monitoring report to PMU	- visual inspection by contractor supervisor and/or environment specialist	Contractor

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	vegetation and tree re-planting. Replace all plants determined to be in an unhealthy condition. • Request in writing from PIU/DSC that construction zones have been restored.					

Summary of Site- and Activity-Specific Plans as per EMP

152. Table 9 summarizes site and activity specific plans to be prepared as per EMP tables.

Table 9: Site- and Activity-Specific Plans/Programs as per EMP

To be Prepared During	Specific Plan/Program	Purpose	Responsible for Preparation	Responsible for Implementation
Detailed Design Phase	Environmental monitoring program as per detailed design	Indicate sampling locations, methodology and parameters	PMU/PIU and PMC/DSC	Contractor
Detailed Design Phase	Erosion control and re-vegetation plan	Mitigate impacts due to erosion	Contractor	Contractor
Detailed Design Phase	List and maps showing utilities to be shifted	Utilities shifting	DSC during preliminary stage Contractor as per detailed design	Contractor
Detailed Design Phase	Contingency plan	Mitigate impacts due to interruption of services during utilities shifting	Contractor	Contractor
Detailed Design Phase	Chance find protocol	Address archaeological or historical finds	PMU and PMC	Contractor
Detailed Design Phase	List of pre-approved sites	Location/s for work camps, areas for stockpile, storage and disposal	PIU and DSC	Contractor
Detailed Design Phase	Waste management plan	Mitigate impacts due to waste generation	Contractor	Contractor
Detailed Design Phase	Traffic management plan	Mitigate impacts due to transport of materials and pipe laying works	Contractor	Contractor
Detailed Design Phase	H&S plan	Occupational health and	Contractor	Contractor

To be Prepared During	Specific Plan/Program	Purpose	Responsible for Preparation	Responsible for Implementation
		safety		

C. Environmental Monitoring Plan

153. Through integration of mitigation measures in project design, impacts are mostly insignificant, temporary in nature and can be properly avoided or mitigated by following proposed mitigation measures given in the EMP of this IEE report.

154. Table 10 provides the indicative environmental monitoring program which includes relevant environmental parameters, with a description of the sampling stations, frequency of monitoring, applicable standards, and responsibility. This will be updated during detailed design to ensure EMP and monitoring program is commensurate to the impacts of the subproject.

155. Environmental monitoring will be done during construction in three levels; namely monitoring development of project performance indicators done by the DSC Environmental Specialist, monitoring implementation of mitigation measures done by the Contractor; and overall regulatory monitoring of the environmental issues done by the PMC/PMU Environmental Specialist. The monitoring carried out by the contractor through the approved agency will be supervised by the Safeguard Specialist of the Design and Supervision Consultant. The Environmental Monitoring Plan for the project is presented in Table 16. The proposed monitoring of all relevant environmental parameters, with a description of the sampling stations, frequency of monitoring, applicable standards and responsible agencies are presented.

Table 10: Environmental Monitoring Plan

	Attributes	Stage	Parameters to be Monitored	Location	Frequency	Responsibility
1	Debris /Construction materials disposal	Construction Stage	Safe disposal of construction wastes	Major construction sites	Random checks	Contractor
2	Dust suppression	Construction Stage	No. of tankers for water sprinkling, Timing of sprinkling, Location of sprinkling, Log Book	Major construction sites	Random checks	Contractor
2	Ambient Air Quality	Construction Stage	RPM, SPM, SO2, NOx, CO	Major construction sites	Once in a season (except monsoons) for the entire construction period	Contractor, to be monitored by an agency engaged with approval using and under NABL Accreditation norms
4	Water quality	Construction stage	TDS, TSS, pH, DO, BOD, COD, Faecal Coliform, Ammonia, Nitrogen	Locations to be decided during detailed design	Twice a year (pre-monsoon and post-monsoon) for the entire period of construction	Contractor, to be monitored by an agency engaged with approval using and under NABL Accreditation norms
5	Noise Levels	Construction	Equivalent Day	All	Once in a	Contractor, to

	Attributes	Stage	Parameters to be Monitored	Location	Frequency	Responsibility
		and Operation Stage	and Night Time Noise Levels	Construction sites	season during construction stage	monitor through approved Monitoring Agency
6	Supply of PPE	Construction Stage	Provision of PPE on site, adequacy of equipment	All Construction sites	Continuous	Contractor
7	Establishing Medical facilities	Construction Stage	Access to health facilities for the construction workers	All Construction sites	Continuous	Contractor
8	Accident record	Construction Stage	No. of fatal accidents, No. of injuries, No. of disabilities	All construction sites	Continuous	Contractor
9	Post construction clearance of site	Post construction	Whether temporary locations for workers camp, site office, and other construction locations are restored to pre-project conditions	All Construction sites	Post construction	Contractor

D. Capacity Building

156. The Environmental Specialist of the DSC will provide the basic training required for environmental awareness followed by specific aspects of Infrastructure Improvement Projects along with Environmental implications for projects. Specific modules customized for the available skill set will be devised after assessing the capabilities of the members of the Training Programme and the requirements of the project. The entire training would cover basic principles of environmental assessment and management; mitigation plans and programmes, implementation techniques, monitoring methods and tools. The proposed training program along with the frequency of sessions is presented in Table 10 below. This training program is intended for the entire destination and is not just specific to this package.

Table 11: Training Modules for Environmental Management (common for entire project)

Program	Description	Participants	Form of Training	Duration/ Location	Training Conducting Agency
A. Pre-Construction Stage					
• Sensitization Workshop	• Introduction to Environment: • Basic Concept of environment • Environmental Regulations and Statutory requirements as per Govt. of India and ADB	• Tourism/Forest/Roads/Culture Department Officials, Project Director and Environmental Specialist of the PMU/PIU	• Workshop	• ½ Working Day	• Environmental Specialist of the PMC and DSC
B. Construction Stage					
• Module 1	• Roles and Responsibilities of officials/contractors/consultants towards protection of environment • Implementation Arrangements	• Engineers and staff of line depts. of GoTN, and PMU/PIU (including the Environmental Specialist)	• Lecture/Interactive Sessions	• ½ Working Day	• Safeguards Specialist of the PMC and DSC
• Module 2	• Monitoring and Reporting System	• Engineers and staff of implementing agencies and PMU/ PIU (including ES)	• Lecture / Interactive Sessions	• ½ Working Day	• Safeguards Specialist of the PMC and DSC

Table 12Training Modules for Environmental Management

Programme	Description	Participants	Form of Training	Duration/ Location	Training Conducting Agency
A. Pre-Construction Stage					
Sensitization Workshop	Introduction to Environment: Basic Concept of Environmental Regulations, Guidelines, EIA Notification, process and methodology for IEE, EMPs and their use and Statutory requirements as per Government of India and ADB.	Tourism /HR&CE Department Officials, Project Director and Environmental Specialist of the PMU/PIU and PMC	Lectures cum interaction & Workshop	½ Working Day	Environmental Specialist of the DSC
Session I					
Module I	Introduction to Environment: Basic	PMU/PIU (including the	Lecture	1 Working	Safeguards Specialist

Programme	Description	Participants	Form of Training	Duration/ Location	Training Conducting Agency
	Concept of Environment Safeguards Regulations and Statutory requirements as per Government of India and ADB guidelines on cultural resources, Environmental considerations in planning, design and implementing projects.	ES), PMC and Engineering staff of the implementing Agencies		Day	of the DSC
Module II	Environmental components impacted in constructions and operation stages Activities causing pollution during Construction and Operation stages Environmental Management Environmental Provisions Implementation Arrangements Methodology of Assessment Good Engineering Practices to be integrated into Contract Documents.	PMU/PIU/PMC (including the ES) and Engineering staff of Tourism Dept.	Workshop	¼ Working Day	Safeguards Specialist of the DSC.
Module III	Implementation of EMPs: Basic features of an EMP, Planning, designing and execution of environmental mitigation and enhancement measures, monitoring and evaluation of environmental conditions – during construction and operation	PMU/PIU (including the ES) Engineering staff of Tourism/HR&CE Dept.	Lecture / Interactive sessions and site visits	2 Working Days	Safeguards Specialist of the PMC with support from the conservation specialist of the PMC.
Module IV	Improved co-ordination with other Departments: Statutory permissions – Procedural requirements co-operation and co- ordination with other Departments.	PMU/PIU (including the ES) Engineering staff of Tourism Dept. and PMC	Lecture / Interactive sessions	1 Working Day	Safeguards Specialist of the DSC.
Module V	Environmental principles of eco-tourism and training and awareness building	Local community groups, NGOs	Lecture / Interactive sessions	½ Working Day	Institutes such as the Wild Life Institute of India
B. Construction Stage					
Session II					

Programme	Description	Participants	Form of Training	Duration/ Location	Training Conducting Agency
Module VI	Role during Construction Roles and Responsibilities of Officials / Contractors / Consultants towards protection of Environment Implementation Arrangements Monitoring Mechanisms	Engineers and Staff of Line Departments of the Govt. of Tamil Nadu and PMU/PIU (including the ES)	Lecture / Interactive sessions	½ Working Day	Safeguards Specialist of the DSC
Session III					
Module VI	Identification of birds species in Pong Wetland, habits of species, biology, ecology of important species, basic knowledge of reptiles of amphibians and fauna identification of plants, including medicinal plants orientation on wetland ecology, monitoring methods, use of instruments as binoculars, digital camera, GPS, etc.	Staff of Forest Department, Youth in the villages, periphery of the Wetland, and other NGOs in the District.	Site visits, Interactive sessions	5-7 working days	Institutes as the Wild Life Institute of India
Module VII	Skill up gradation on eco-tourism and nature guides dealing with tourists interpretational skills, micro planning, natural resources, management of self-help groups, etc.	Youth in the villages, periphery and other NGOs in the District	Site visits, Interactive sessions	5-7 Working Days	Tourism Department, and Institutes as the Wild Life Institute of India.
Module VIII	Monitoring Environmental Performance during Construction: Air, Water, Soil and Noise, tree survival Monitoring requirement and techniques, Evaluation and Review of results, Performance indicators and their applicability, possible corrective actions, reporting requirements and mechanisms	PIU/ PMC/NGOs and community representatives	Lectures, Workshop and site visits	4 – 5 Working Days	Safeguards Specialist of the DSC – During initial stage of Construction

E. Environmental Management Plan Implementation Cost

157. As part of good engineering practices in the project, there have been several measures as safety, signage, dust suppression, procurement of personal protective equipment, provision of drains, etc. and the costs for which will be included in the design costs of specific subprojects. Therefore, these items of costs have not been included in the IEE budget. Only those items not covered under budgets for construction are considered in the IEE budget.

158. This is a small construction project and it is not expected to cause much significant air, water and noise pollution. The main EMP cost will arise from monitoring of environmental parameters (air, water and noise) and training.

159. The costs of water sprinkling for dust suppression and providing personal protective equipment's to construction workers shall borne by contractor as part of conditions of contract. In addition, the sources of funds for Mitigation measures during construction stage including monitoring during construction stage are also to be borne by the contractor. These are deemed to be included as part of the contract price amount quoted by the contractor for the works. The costs of components for monitoring in operation stage and the capacity building costs are to be funded by the PMU. The EMP cost is given in the Table 11 below.

Table 13: Indicative Environmental Management Plan Budget

	Particulars	Stages	Unit	Total Number	Rate (₹)	Cost (₹)	Source of Fund
A. Monitoring Measures							
1	Air quality monitoring	Detailed design	Per sample	1	10,000	10,000	PMU
2	Noise Levels – silence zones	Detailed design	Per location	1	4,000	4,000	PMU
3	Ambient Air Quality	Construction	Per Sample	4	10,000	40,000	Contractor budget
4	Ambient Noise Quality	Construction	Per Sample	6	4,000	24,000	Contractor budget
Sub- Total (A)						78,000	
B.	Capacity Building – Training cost						
1	Sensitization Workshop	Pre-Construction	L.S			1,50,000	PMU
2	Training Session I	Construction	L.S			1,50,000	PMU
3	Training Session II	Construction	L.S			1,50,000	PMU
Sub -Total (B)						4,50,000	
Total (A+B) (₹)						5,28,000	

IX. FINDINGS AND RECOMMENDATIONS

160. The proposed components as part of the package are in line with the subproject selection criteria for the program. The subproject conforms to all Government of India and ADB regulations, policies, and standards including all necessary government permits and clearances. The proposed subproject components involve various interventions in the identified for construction of Yatri Nivas at a major tourist destination in Tamil Nadu. The selection of components in line with the subproject selection criteria laid down by ADB, and the recommendations of the Central Public Health and Environmental Engineering Organization (CPHEEO) Sewerage Manual avoids any significant encroachment / direct impact on tourist attractions and the livelihood of the people in the area. Further, the siting of the components has

been based on appropriate considerations to minimize environmental impacts. The subproject will conform to all Government of India/Tamil Nadu and ADB regulations, policies, and standards including all necessary government permits and clearances.

161. The significance of the environmental impacts will be primarily due to the construction related activities. The resultant potential impacts from these proposals can be offset through provision of proven mitigation measures during the design and adoption of good engineering practices during construction and implementation. Further, the provision of environmental infrastructure, including access to sanitation and waste management facilities within the YatriNivas, will enhance the environmental conditions and minimize the pollution related aesthetic quality near the Yatri Nivas and the other destinations.

162. The specific management measures laid down in the IEE will effectively address any adverse environmental impacts due to the subproject. The effective implementation of the measures proposed will be ensured through the building up of capacity towards environmental management within the PMU supplemented with the technical expertise of a Safeguards Specialist as part of the DSC Consultants. Further, the environmental monitoring plans provide adequate opportunity towards course correction to address any residual impacts during construction or operation stages.

X. CONCLUSIONS

163. The IEE carried out for the subproject shows that the proposed Yatri Nivas at Alangudi, Thiruvarur District will result in increasing tourist arrival to Alangudi, Thiruvarur District, provide better facilities and comfort to the tourists with enhanced environmental benefits, and that any adverse environmental impact can be addressed through proper location, planning, and design of the proposed subproject; control of construction activity and mitigation measures. The EMP provides for mitigation of all identified impacts and the contract clauses for the environmental provisions will be part of the civil works contracts. Further, the proposed subproject elements have been consulted with the stakeholders and no significant issues requiring redressal in terms of environmental safeguards exist.

164. Based on the findings of the IEE, there are no significant impacts and the classification of the subproject as Category “B” is confirmed. No further special study or detailed environmental impact assessment (EIA) needs to be undertaken to comply with ADB SPS (2009).

Appendix 1(a): PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

Details of the Site: The site is free from encumbrances and is freely available with the Government of Tamil Nadu (HR&CE) further, there is no necessity of any utility shifting and cutting of trees. The DSC has carried out a field visit and has interacted with various stake holders. The details of the site visit are given below:

Date of Visit: 07.06.2017

Name of the work: Construction of Yatri Nivas for Arulmigu Abathsagayeswarar Temple at Alangudi Village, Thiruvarur District

Name of the Person Visited the site: Mr. Anil Kumar Panda (Safeguard Specialist - Environmental and Social) and Mr. Loganathan (Field Engineer)

Description of the Site: The site is located 50 m away from the temple. The site is very close to the Bitumen concrete approach road. It is separated from the temple compound by cultivated land in between. A BSNL office has been located to the left of the property. A pictorial map has been provided in the following page. This site is barren and free from any encroachments. The property boundaries are clearly marked. This property is in the possession of the Department of HR&CE, Government of Tamilnadu. Hence, there is no requirement for any land to be acquired.

Soil sample collection: Soil samples have been collected at different depths in 2 locations at site.

The Public Consultation was held with the local people and department officials' participants. This is with reference to the need and justification for selecting these components with the scope to increase the inflow of tourists. During the discussion the IEE components and Social Safeguard issues (Water/Air/Soil/Noise/Flora/Fauna/Climate etc.) were explained and the following suggestions were received from the participants.

The participants concurred with the selection of components for the infrastructure development for Yatri Nivas, Alangudi.

They also suggested the need for maintenance of the new components to be introduced need to be taken care by the line department with full participation with the local community. The local educated men/women at the age group of 15-35 with minimum qualification of Degree or 10+2 could be selected by the line Department for providing the need-based skill development for guides and volunteers and securities.

The local community members especially self-help groups could be given the entrepreneur training to manage the souvenir and mini restaurants to provide assistance to the tourists.

The local community members are willing to take up training on the major components related to environmental enhancement so as to monitor "activities and its follow up" in the future.

Drinking water facility with treatment and adequate toilet facilities to be given priority. While laying road the present component of cement road could be replaced by the latest technology of paver blocks. Waste collection, segregation and final disposal need to be planned and implemented.

Figure 2: Pictures Taken during Site Visit

Participants of Public Consultation

ATTENDANCE OF THE PARTICIPANTS FOR THE PUBLIC CONSULTATION HELD ON 7th JUNE 2017
FOR THE TOURISM INFRASTRUCTURE DEVELOPMENT AT: Mangudi, Yatrinivas, HR&CE Dept

Sr. No.	Name	Occupation	Contact Details	Signature
1	Atul Panda	Consultant	9861048089	[signature]
2	S. Karunanidhi	Accountant	9787273012	[signature]
3	B. GUNASEELAN	Public	9566464916	[signature]
4	K. Narayanan	Public	8220292853	[signature]
5	ELAVARASAN	"	9786978997	Selvasami
6	Sankar	"	9655128686	Sankar
7	Vinoth	Public	9843469487	[signature]
8	S. Baskar	Clerk	9787278038	S. Baskar
9	Panneerselvam	Public	9787799504	P. Pan[illegible]
10	P. Mahendran	Public	9786571659	P. Mahendran
11	Selvakumari, U.	Public	9600584698	[signature]
12	S. CHITRAKANTHAM	clerk	9443589460	[signature]
13	M. Gnanasekaran		7402339941	[signature]
14				
15				

Land area - 2.40 Acres

Appendix 2(b): PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

The site visit by the DSC team (Mr. Anil Kumar Panda (Safeguard Specialist - Environmental & Social), Mr. Loganathan (Field Engineer)) was conducted on 07th June, 2017 to organize a public consultation with a view to appraise. The progress made in IDIPT project implementation by the line department (HR&CE) and to elicit the public opinion/issues/problems faced during the construction stage- (Environmental Impacts, Constraints, benefits, tree felling, enhancement measures) . After the dialogue with the respective community the summary is presented to the line department for necessary action. The main objective of this field visit was to study and observe the impacts of the proposed infrastructure projects on the respective community in order to suggest suitable preventive, promotional and protective interventions to be undertaken by the implementing agency.The visits were made with prior intimation to the concerned officials in the district with advanced communication to Tamil Nadu Tourism Department, Government of Tamil Nadu. The visit included the site/location selected for the infrastructure development with the help of state holders:

- the concerned official of Temple Management Authorities
- discussion with the local people,
- Elected council/ward members.

The perspectives of the subproject development were discussed during the consultation with the participants. This is with reference to the need and justification for selecting these components with the scope to increase the inflow of tourists. During the discussion the IEE components and Social Safeguard issues (Water/Air/Soil/Noise/Flora/Fauna/Climate etc.) were explained and the following suggestions were received from the participants.

- The participants concurred with the selection of components for the infrastructure development for Vedaranyeswarar Temple.
- They also suggested the maintenance of the new components to be introduced need to be taken care by the line department with full participation with the local community.
- The local educated man/women at the age group of 15-35 with minimum qualification of Degree or 10+2 could be selected by the line Department for providing the need based skill development for guides and volunteers and securities.

- The local community members specially self help groups could be given the entrepreneur training to provide assistance to the Tourists.
- The local community members are willing to take up training on the major components related to environmental enhancement so as to monitor in the future.
- Drinking water facility with treatment and adequate toilet facilities to be given priority.
- While laying road the present component of cement road could be replaced by the latest technology of paver blocks.
- Waste collection, segregation and final disposal need to be planned and implemented.

Figure No : A&B- Pictures taken during site visit

ATTENDANCE OF THE PARTICIPANTS FOR THE PUBLIC CONSULTATION HELD ON 7th JUNE 2017
FOR THE TOURISM INFRASTRUCTURE DEVELOPMENT AT: Vedhaariyaram

Sr. No.	Name	Occupation	Contact Details	Signature
1	Anil Panda	Consultant	9861048089	[signature]
2	R. Ravisamy	Manager	9047802171	[signature]
3	A. Raman	Accountant	9486520316	[signature]
4	P. Chitra	H.wife	9688791960	[signature]
5	K. Arumugam	Owner of Sakthi Priya Silk House	9443150649	[signature]
6	P. Gunasekaran	Ambal Group	9443350332	[signature]
7	K. PACKRISAMY	GANESH JEWELLRY	9486044966	[signature]
8	Arunkumar. J	Store	9444721282	[signature]
9	Moorthy Raney	[illegible]	9940754717	[signature]
10				
11				
12				
13				
14				
15				

Appendix 3: CONTRACT CLAUSES TO BE INTEGRATED INTO BID DOCUMENTS

A. Construction of Yatri Nivas, Alangudi, Thiruvarur District & Construction of rest house at Vedaranyam, Nagapattinam District

1. Movement / Circulation Plan during Construction

For all construction activities in active tourist destinations, the Contractor will prior to initiation of construction activities, prepare and get approved by the Engineer, a construction plan including the staging, sequencing of construction activities, circulation plans to ensure smooth movement to pilgrims and tourists, including provision of alternative routes, etc. The plans will be disseminated at key entry points to these tourist locations.

2. Quarry and Borrowing

Considering the quantum of activities, it is envisaged that no borrow areas and quarry sites will be opened. Raw materials will be procured from licensed quarry owners. Similarly, no crusher sites will be opened by the contractor. Also, No borrow area shall be made available by the Employer for this work. The arrangement for the source of supply of the material for the civil works shall be the sole responsibility of the Contractor.

3. Debris Disposal

Dismantled material shall be stacked, collected and disposed at suitable locations so that no pollution arises out of this. Those shall be neatly piled at points designated by the Engineer with all lifts and leads. Materials, which can be used or auctioned, shall be stored in neat piles at locations designated by Engineer with all lifts and leads.

The contractor will identify potential sites for disposal of hazardous construction debris and general construction wastes prior to start of construction and dismantling operations. The contractor will obtain approval on identified sites from the Engineer of Supervision Consultant and disposal will be only after consent letter from the Engineer.

4. Precautions for Protection of Environmental Resources

The Contractor will ensure that construction activities do not result in any contamination of land or water by polluting substances.

Unless otherwise provided in the specifications, the Contractor will ensure that no trees or shrubs or waterside vegetation are felled or harmed except those required to be cleared for execution of the works. The Contractor will protect trees and vegetation from damage to the satisfaction of the Engineer.

The Contractor will not use or permit the use of wood as a fuel for the execution of any part of the works and to the extent practicable, will ensure that fuels other than wood are used for cooking and heating in all camps and living accommodations. Any wood so used must be harvested legally, and the Contractor will provide the Engineer with copies of the relevant permits, if required.

The Contractor will take all precautions necessary to ensure that vegetation existing adjacent to the project site is not affected by fires arising from the execution of the contract.

Should a fire occur in the natural vegetation or plantation adjacent to the project site for any reason, the Contractor will immediately suppress it. Areas of forest, shrub, or plantation damaged by fire considered by the Engineer to have been initiated by the Contractor's staff or laborers will be replanted or otherwise restored.

The Contractor will confine operations to the dry season, use silt traps and dispose spoils in locations approved by the Engineer that will not promote instability and result in destruction of property, vegetation, irrigation and water supply. Disposal near wetlands, protected areas, and other areas that will inconvenience or deprive local residents of their livelihood will not be allowed. Acidic and saline spoils will not be spread into agricultural land.

The Contractor will consult with local residents and local government before locating project offices, sheds, and construction plant.

The Contractor will maintain ecological balance by preventing felling of trees, water pollution and defacing of natural landscape.

In the conduct of cleaning activities and operation of equipment, the Contractor will utilize such practicable methods and devices as are reasonably available to control, prevent and otherwise minimize air/noise pollution.

5. Noise and Air Pollution

The Contractor will monitor the environmental parameters periodically as specified in the monitoring plan and report to the Engineer.

The Contractor will indemnify and keep indemnified the Employer from and against any liability for damages on account of noise or other disturbance created while carrying out the work, and from and against all claims, demands, proceedings, damages, costs, charges, and expenses, whatsoever, in regard or in relation to such liability.

6. Quality Assurance Plan / Manual

Post the signing of the contract and prior to commencement of civil works, the contractor shall produce the Quality Assurance Plan covering the following items:

(i) Names, roles, responsibilities of the key Personnel of the Contractor's staff responsible for overseeing each major activity;
(ii) Methodology and work plan for each subproject.

7. Utilities Diversion

For the utilities diversion and restoration, the lines Departments are to be consulted for planning and temporary diversion and final restoration.

8. Avoidance of Interference

The Contractor shall not interfere unnecessarily or improperly with the convenience of the public, or the access to and use and occupation of all roads and footpaths, irrespective of whether they are public or in the possession of the Employer or of others.

The Contractor shall indemnify and hold the Employer harmless against and from all

damages, losses and expenses (including legal fees and expenses) resulting from any such unnecessary or improper interference.

The Contractor shall be deemed to have been satisfied as to the suitability and availability of access routes to the Site. The Contractor shall use reasonable efforts to prevent any road or bridge from being damaged by the Contractor's traffic or by the Contractor's Personnel. These efforts shall include the proper use of appropriate vehicles and routes. Except as otherwise stated in these Conditions:

The Contractor shall (as between the Parties) be responsible for any maintenance which may be required for his use of access routes;

The Contractor shall provide all necessary signs or directions along access routes, and shall obtain any permission which may be required from the relevant authorities for his use of routes, signs and directions; All fossils, coins, articles of value or antiquity, and structures and other remains or items of geological or archaeological interest found on the Site shall be placed under the care and authority of the Employer.

The Contractor shall take reasonable precautions to prevent Contractor's Personnel or other persons from removing or damaging any of these findings. The Contractor shall, upon discovery of any such finding, promptly give notice to the Engineer, who shall issue instructions for dealing with it.

9. Utilities Diversion

For the utilities diversion and restoration, the lines Departments are to be consulted for planning and temporary diversion and final restoration

B. Provision of Street Furniture

The exact location of the Street Furniture shall be confirmed with Project Implementation Unit (PIU) and local municipal body.

Appropriate Stock yard to be arranged by the contractor for storage of the materials.

C. General

The Contractor will be responsible for implementation of environmental provisions outlined in the EMP, in addition to adhering to all environmental provisions in the applicable specifications for the works will be adhered to as part of good engineering practices.

The contractor might be using DG sets for which the permission will be required under Air act 1981.

No fuel storage takes place in this project and for construction purposes, the fuel shall be procured from the existing petrol bunks

For labor accommodation, no labor camp will be established and for accommodation of labors nearby construction sites, rented houses will be engaged by the contractor. Further, labor license from the District Labor commissioner shall be provided by the contractor.

All works undertaken towards protection of environmental resources as part of the EMP and as part of good engineering practices while adhering to relevant specifications will be deemed to be incidental to works being carried out and no separate payment will be made unless otherwise specified explicitly. The costs towards environmental management as per EMP unless otherwise provided as a separate head, will be deemed to be part of the BOQ of the project. The scope of works of the contractor towards the implementation of the environmental provisions will be as follows:

(i) Abide by all existing Environmental regulations and requirements of the Government of India , during implementation;
(ii) Compliance with all mitigation measures and monitoring requirements set out in the Environmental Management Plan (EMP);
(iii) Submission of a method statement detailing how the subproject EMP will be complied with. This will include methods and schedule of monitoring.
(iv) Monitoring of project environmental performance and periodic submission of monitoring reports.
(v) Compliance of all safety rules at work, and Provision of adequate health and safety measures such as water, food, sanitation, personal protective equipment, workers insurance, and medical facilities.

The detailed provisions for specific environmental issues will be as outlined in the EMP table on impacts and mitigation measures.

Occupational Health And Safety During Construction. The Contractor will, in accordance with the safety and health provisions specified in the EMP, provide workers with a safe and healthy working environment, in the work areas, through application of preventive and protective measures consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines. The borrower/client will take steps to prevent accidents, injury, and disease arising from, associated with, or occurring during the course of work by:

(i) Providing preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances; Providing appropriate equipment to minimize risks and requiring and enforcing its use;
(ii) Training workers and providing them with appropriate incentives to use and comply with health and safety procedures and protective equipment;
(iii) Documenting and reporting occupational accidents, diseases, and incidents; and
(iv) Having emergency prevention, preparedness, and response arrangements in place.

Goggles and gas masks shall be worn at the time of dismantling. Leather gloves shall be worn by the workers. Screens made of G.I. Sheets shall be placed wherever necessary to prevent the flying pieces from injuring the workers.

(i) The Contractor shall comply with all applicable safety regulations by taking care for the safety of all persons entitled to be on the Site, Use reasonable efforts to keep the Site and Works clear of unnecessary obstruction so as to avoid danger to these persons.
(ii) Provide fencing, lighting, guarding and watching of the Works until completion and taking over
(iii) Provide any Temporary Works (including roadways, footways, guards and fences) which may be necessary, because of the execution of the Works, for

the use and protection of the public and of owners and occupiers of adjacent land.

Clause for Nonconformity to EMP - Protection of the Environment. The Contractor shall implement all mitigation measures for which responsibility is assigned to him as stipulated in the EMP Report. Any lapse in implementing the same will attract the damage clause as detailed below:

(i) All lapse in obtaining clearances / permissions under statutory regulations and violations of any regulations with regard to eco-sensitive areas shall be treated as a major lapse.

(ii) Any complaints of public, within the scope of the Contractor, formally registered with the DSC, PMC or with the PIU and communicated to the Contractor, which is not properly addressed within the time period intimated by the DSC / PMC, PIU shall be treated as a major lapse.

(iii) Non-conformity to any of the mitigation measures stipulated in the EMP Report (other than stated above) shall be considered as a minor lapse.

(iv) On observing any lapses, DSC shall issue a notice to the Contractor, to rectify the same.

(v) Any minor lapse for which notice was issued and not rectified, first and second reminders shall be given after ten days from the original notice date and first reminder date respectively. Any minor lapse, which is not rectified, shall be treated as a major lapse from the date of issuing the second reminder.

(vi) If a major lapse is not rectified upon receiving the notice DSC shall invoke reduction, in the subsequent interim payment certificate.

(vii) For major lapses, 10% of the interim payment certificate will be withheld, subject to a maximum limit of about 0.5% of the contract value.

(viii) If the lapse is not rectified within one month after withholding the payment, the amount withheld shall be forfeited.

Post Construction Clearance. On completion of work, wherever applicable, the Contractor will clear away and remove from the sites surplus materials, rubbish, scaffoldings, and temporary works of every kind and leave the whole of the sites and works in a clean condition to the satisfaction of the Engineer.

All temporary sedimentation and pollution control works, which are not provided in the Bill of Quantities, shall be deemed as incidental to the civil work and other items of work and as such no separate payment shall be made for the same.

Labor Welfare:

(i) The Contractor shall make arrangements for the engagement of all staff and labor, local or otherwise, and for their payment, housing, feeding and transport.

(ii) The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labor with appropriate qualifications and experience from sources within the State/Country.

(iii) The Contractor shall pay rates of wages, and observe conditions of labor, which are not lower than those established for the trade or industry where the work is carried out. If no established rates or conditions are applicable, the Contractor shall pay rates of wages and observe conditions which are not lower than the general level of wages and conditions observed locally by employers whose trade or industry is similar to that of the Contractor.

(iv) The Contractor shall inform the Contractor’s Personnel about their liability to pay personal income taxes in the Country in respect of such of their salaries, wages,

allowances, and any benefits as are subject to taxes under the Laws of the Country for the time being in force, and the Contractor shall perform such duties in regard to such deductions thereof as may be imposed on him by such Laws.

(v) The Contractor shall comply with all the relevant labor Laws applicable to the Contractor's Personnel, including Laws relating to their employment, health, safety, welfare, immigration and emigration, and shall allow them all their legal rights.

(vi) The Contractor shall require his employees to obey all applicable Laws, including those concerning safety at work. The Contractor shall provide and maintain all necessary accommodation and welfare facilities for the Contractor's Personnel .No temporary dwelling units are envisaged to be built for the labor force accommodation but rented premises will utilized for the same with all basic amenities. The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the Contractor's Personnel.

(vii) In collaboration with local health authorities, the Contractor shall ensure that medical staff, first aid facilities, sick bay and ambulance service are available at all times at the Site and at any accommodation for Contractor's and Employer's Personnel, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics.

(viii) The Contractor shall appoint an accident prevention officer at the Site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility, and shall have the authority to issue instructions and take protective measures to prevent accidents. Accident records are to be maintained at site for the Engineer's vigilance.

(ix) The contractor shall acquire appropriate labor license and labor insurance as per the labor act.

(x) The Contractor shall keep complete and accurate records of the employment of labor at the Site. The records shall include the names, ages, genders, hours worked and wages paid to all workers. These records shall be summarized on a monthly basis and shall be available for inspection by the Engineer during normal working hours.

(xi) The Contractor shall ensure that during continuance of the contract, the Contractor and his Sub-contractors shall abide at all times by all existing enactments on environmental protection and rules made there under, regulations, Notifications and bye-laws of the State or Central Government, or local authorities and any other law, bye-law, regulations that may be passed or Notification that may be issued in this respect in future by the State or Central Government or the local authority.

The Water (Prevention and Control of Pollution) Act, 1974. This provides for the prevention and control of water pollution and the maintaining and restoring of wholesomeness of water.

The Air (Prevention and Control of Pollution) Act, 1981. This provides for prevention, control and abatement of air pollution. 'Air Pollution' means the presence in the atmosphere of any 'air pollutant', which means any solid, liquid or gaseous substance (including noise) present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment.

The Environment (Protection) Act, 1986. This provides for the protection and improvement of environment and for matters connected therewith, and the prevention of

hazards to human beings, other living creatures, plants and property. 'Environment' includes water, air and land and the interrelationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organism and property.

The Public Liability Insurance Act, 1991. This provides for public liability insurance for the purpose of providing immediate relief to the persons affected by accident occurring while handling hazardous substances and for matters connected herewith or incidental thereto. Hazardous substance means any substance or preparation which is defined as hazardous substance under the Environment (Protection) Act 1986, and exceeding such quantity as may be specified by Notification by the Central Government.

Labor Enactments. The Contractor and his Sub-contractors shall abide at all times by all existing labor enactments and rules made there under, regulations, Notifications and bye laws of State or Central Government or local authority and any other labor law (including rules), regulations, bye laws that may be passed or Notification that may be issued under any labor law in future either by the State or the Central Government or the local authority.

The Contractor shall, if required by the Engineer, provide a return in detail of the employment of labor, in such form and at such intervals as the Engineer may prescribe, showing the staff and the numbers of the several classes of labor, employed by the Contractor on the Site, from time to time.

(i) **Workmen Compensation Act, 1923.** The Act provides for compensation in case of injury by accident arising out of and during the course of employment.

(ii) **Payment of Gratuity Act, 1972.** Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years service or more or on death at the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.

(iii) **Employees' PF and Miscellaneous Provisions Act, 1952**. The Act provides for monthly contributions by the employer plus workers@10% or 8.33%. The benefits payable under the Act are:

- Pension or family pension on retirement or death as the case may be.
- Deposit linked insurance on the death in harness of the worker.
- Payment of PF accumulation on retirement/death etc.

(iv) **Maternity Benefit Act, 1951**. The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.

(v) **Contract Labor (Regulation and Abolition) Act, 1970**. The Act provides for certain welfare measures to be provided by the Contractor to contract labor and in case the Contractor fails to provide, the same are required to be provided by the Principal Employer by Law. The principal employer is required to take Certificate of Registration and the Contractor is required to take a License from the designated Officer. The Act is applicable to the establishments or Contractor of principal employer if they employ 20 or more contract labor.

(vi) **Minimum Wages Act, 1948**. The employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of Buildings, Roads, and Runways are scheduled employment.

(vii) **Payment of Wages Act, 1936**. It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.

(viii) **Equal Remuneration Act, 1979**. The Act provides for payment of equal wages for work of equal nature to Male and Female workers and not for making discrimination against Female employees in the matters of transfers, training and promotions etc.

(ix) **Payment of Bonus Act, 1965**. The Act is applicable to all establishments employing 20 or more workmen. The Act provides for payments of annual bonus subject to a minimum of 8.33 % of wages and maximum of 20 % of wages to employees drawing Rs. 3,500/- per month or less. The bonus to be paid to employees getting Rs. 2,500/- per month or above up to Rs.3, 500/- per month shall be worked out by taking wages as Rs.2,500/- per month only. The Act does not apply to certain establishments. The newly set up establishments are exempted for five years in certain circumstances. Some of the State Governments have reduced the employment size from 20 to 10 for the purpose of applicability of the Act.

(x) **Industrial Disputes Act, 1947**. The Act lays down the machinery and procedure for resolution of industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.

(xi) **Industrial Employment (Standing Orders) Act, 1946**. It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the employer on matters provided in the Act and get the same certified by the designated Authority.

(xii) **Trade Unions Act, 1926**. The Act lays down the procedure for registration of trade unions of workmen and employees. The trade unions registered under the Act have been given certain immunities from civil and criminal liabilities.

(xiii) **Child Labor (Prohibition and Regulation) Act, 1986**. The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of child labor is prohibited in Building and Construction Industry.

(xiv) **Inter-State Migrant Workmen's (Regulation of Employment and Conditions of Service) Act, 1979**. The Act is applicable to an establishment which employs 5 or more interstate migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The inter-state migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, travelling expenses from home up to the establishment and back, etc.

(xv) **The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 and the Cess Act of 1996**. All the establishments who carry on any building or other construction work and employ 10 or more workers are covered under this Act. All such establishments are required to pay Cess at rate not exceeding 2% of the cost of construction as may be notified by the Government. The employer of the establishment is required to provide safety measures at the Building or Construction work and other welfare measures, such as Canteens, First-aid facilities, Ambulance, Housing accommodation for Workers near the workplace etc. The employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.

(xvi) **The Factories Act, 1948**. The Act lays down the procedure for approval of plans before setting up a factory, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated authorities. It is applicable to premises employing 10 persons or more with aid of power or 20 or more persons without the aid of power engaged in manufacturing process.

(xvii) **The Apprentices Act, 1961**.The Contractor shall duly comply with the provisions of the Apprentices Act, 1961, the rules made there under and the orders that may be issued from time to time under the said Act and the said Rules and on his failure or neglect to do so, he shall be subject to all liabilities and penalties provided by the said Act and the said Rules. 'The Contractor shall, if required by the Engineer, provide a return in detail of the employment of labor, in such form and at such intervals as the Engineer may prescribe, showing the staff and the numbers of the several classes of labor, employed by the Contractor on the Site, from time to time.' Safety and Welfare Provisions for labor to be employed by the Contractor.

All necessary personal safety equipment as considered adequate by the Engineer shall be available for use of persons employed on the Site and maintained in a condition suitable for immediate use; and the Contractor shall take adequate steps to ensure proper use of such equipment by those concerned All workmen at site shall be provided with safety helmets and yellow/orange jackets. Workmen required on site during night hours shall be provided with fluorescent yellow jackets with reflective lopes.

The Contractor shall provide all necessary fencing and lights to protect the public from accidents and shall be bound to bear the expenses of defending every suit, action or other proceedings at law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and costs which may be awarded in any such suit, action or proceedings to any such person or which may with the consent of the Contractor be paid to compromise any claim by any such person.

(i) First Aid-At every workplace, there shall be maintained, in a readily accessible place, first aid appliances including an adequate supply of sterilized dressings and sterilized cotton wool as prescribed in the Factory Rules of the State in which the work is carried on. The appliances shall be kept in good order and, in large work places; these shall be placed under the charge of a responsible person who shall be readily available during working hours.

(ii) Accommodation for Labor: The Contractor shall during the progress of the work provide, erect and maintain necessary temporary living accommodation (in rented premises) and ancillary facilities for labor at his own expense to standards and scales approved by the Engineer.

(iii) Drinking Water: In every workplace, there shall be provided and maintained at suitable places easily accessible to labor, a sufficient supply of cold water fit for drinking. Where drinking water is obtained from an intermittent public water supply each workplace shall be provided with storage tanks where drinking water shall be stored.

(The Environment Management Plan is an integral part of the contract and the contractor has the responsibility to implement it under the supervision of the Environmental officer of the Construction Supervision Consultant. All actions taken by the Environmental officer shall be deemed to have the concurrence of the "Engineer" as defined in the contract data. All management measures of the Environment and Management plan are deemed to be incidental to the work unless otherwise provided in the BOQ. No separate payments shall be made for implementing these measures.)

Appendix 4(a): RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST

URBAN DEVELOPMENT

Instructions:
(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by Director, RSES and for approval by the Chief Compliance Officer.
(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title: "Construction Yatri Nivas For Arulmigu Abathsagayeswarar temple at Alangudi Village,Valangaiman Taluk,Thiruvarur District, TamilNadu"
Sector Division: INRM

SCREENING QUESTIONS	Yes	No	REMARKS
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
• Cultural heritage site		√	
• Protected Area		√	The Land is owned by HR&CE Department and located in the heart of the city in populated areas.
• Wetland		√	
• Mangrove		√	
• Estuarine		√	
• Buffer zone of protected area		√	
• Special area for protecting biodiversity		√	
• Bay		√	
B. Potential Environmental Impacts Will the Project cause…			
• Ecological disturbances arising from the establishment of a plant or facility complex in or near sensitive habitats?		√	During construction, no tree felling is being felt necessitated.
• Eventual degradation of water bodies due to discharge of wastes and other effluents from plant or facility complex?		√	No waterbody is located adjacent to the proposed construction site.
• Serious contamination of soil and groundwater?		√	This issue is not envisaged in the proposed subproject activities.
• Aggravation of solid waste problems in the area?		√	Waste generated from demolition of the present structure will be disposed

			off in low lying areas and approved municipality dump yard. Liquid and solid waste generated at the YatriNivas will be disposed off in compliance with CPCB stipulations.
• Public health risks from discharge of wastes and poor air quality; noise and foul odour from plant emissions?		√	No discharge of liquid waste is envisaged during the construction phase. Temporary air emission and higher noise level will be felt during the construction period and will be limited to 8/10 hours during operating daytime.
• Short-term construction impacts			
○ Soil erosion		√	No steep slopes involved in this subproject hence soil erosion of any kind is ruled out.
○ Deterioration of water quality		√	No discharge of waste water is involved in the subproject activity.
○ Deterioration of air quality	√		Temporary air emission will be experienced during the construction period which will be limited to 8/10 hours during operating period.
○ Noise and vibration from construction equipment	√		Higher noise level will be felt during the construction period and will be limited to 8/10 hours during operating period.
• dislocation or involuntary resettlement of people		√	Project will be erected on HR&CE owned land.
• Social conflicts arising from the influx of construction laborers from other areas?		√	Not envisaged as only local labor force will be preferably employed.
• Environmental degradation (e.g. erosion, soil and water contamination, loss of soil fertility, disruption of wildlife habitat) from intensification of agricultural land use to supply raw materials for plant operation; and modification of natural species diversity as a result		√	

of the transformation to monoculture practices?			
• Water pollution from discharge of liquid effluents?		√	No discharge of waste water is involved in the subproject activity.
• Air pollution from all plant operations?	√		Temporary air emission will be experienced during the construction period which will be limited to 8/10 hours during operating period .
• Gaseous and odour emissions to the atmosphere from processing operations?		√	Not envisaged from the subproject activity.
• Accidental release of potentially hazardous solvents, acidic and alkaline materials?	√		An emergency handling procedure will be in place to meet such contingencies.
• Uncontrolled in-migration with opening of roads to forest area and overloading of social infrastructure?		√	The subproject would accommodate only the tourists.
• Occupational health hazards due to fugitive dust, materials handling, noise, or other process operations?		√	An emergency handling and management plan comprising of EHS procedures will be in place to meet such contingencies.
• Disruption of transit patterns, creation of noise and congestion, and pedestrian hazards aggravated by heavy trucks?		√	The subproject is confined to a clear cut boundarywall separating the location from it's surrounding.
• Disease transmission from inadequate waste disposal?		√	Adequate care will be taken so that waste is collected and disposed in a safe manner meeting the CPCB guidelines.

Appendix 5(b): RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST

URBAN DEVELOPMENT

Instructions:
(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by Director, RSES and for approval by the Chief Compliance Officer.
(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title: "Construction of Tourist Rest House at Vedharanayam, Nagapattinam District, Tamilnadu."
Sector Division: **INRM**

SCREENING QUESTIONS	Yes	No	REMARKS
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
• Cultural heritage site		√	
• Protected Area		√	The Land is owned by the Government of Tamilnadu and located in the heart of the town / in populated areas.
• Wetland		√	
• Mangrove		√	
• Estuarine		√	
• Buffer zone of protected area		√	
• Special area for protecting biodiversity		√	
• Bay		√	
B. Potential Environmental Impacts Will the Project cause…			
• Ecological disturbances arising from the establishment of a plant or facility complex in or near sensitive habitats?		√	During construction, no tree felling is felt necessitated for the construction activities.
• Eventual degradation of water bodies due to discharge of wastes and other effluents from plant or facility complex?		√	No waterbody is located adjacent to the proposed construction site.

SCREENING QUESTIONS	Yes	No	REMARKS
• Serious contamination of soil and groundwater?		√	This issue is not envisaged in the proposed sub-project activities. Proper care has to be taken by the contractor.
• Aggravation of solid waste problems in the area?		√	Waste generated from demolition of the present structure will be disposed off in low lying areas and approved municipality dump yard. Liquid and solid waste generated at the ***Rest house*** will be disposed off in compliance with CPCB stipulations.
• Public health risks from discharge of wastes and poor air quality; noise and foul odour from plant emissions?		√	No discharge of liquid waste is envisaged during the construction phase. Temporary air emission and higher noise level will be felt during the construction period and will be limited to 8/10 hours during operating daytime.
• Short-term construction impacts			
o Soil erosion		√	No steep slopes involved in this subproject hence soil erosion of any kind is ruled out.
o Deterioration of water quality		√	No deterioration of waste water is foreseen in the subproject activity.
o Deterioration of air quality	√		Temporary air emission will be experienced during the construction period which will be limited to 8/10 hours during operating period.
o Noise and vibration from construction equipment	√		Higher noise level will be felt during the construction period and will be limited to 8/10 hours during operating period.
• dislocation or involuntary resettlement of people		√	Project will be erected on GoTN owned land.
• Social conflicts arising from the influx of construction laborers from other areas?		√	Not envisaged as only local labour force will be preferably employed. However, it depends on the contractor.

SCREENING QUESTIONS	Yes	No	REMARKS
• Environmental degradation (e.g. erosion, soil and water contamination, loss of soil fertility, disruption of wildlife habitat) from intensification of agricultural land use to supply raw materials for plant operation; and modification of natural species diversity as a result of the transformation to monoculture practices?		√	Not applicable to this site.
• Water pollution from discharge of liquid effluents?		√	No discharge of waste water is involved in the subproject activity.
• Air pollution from all plant operations?	√		Temporary air emission will be experienced during the construction period which will be limited to 8/10 hours during operating period.
• Gaseous and odour emissions to the atmosphere from processing operations?		√	Not envisaged from the subproject activity.
• Accidental release of potentially hazardous solvents, acidic and alkaline materials?	√		An emergency handling procedure will be in place to meet such contingencies.
• Uncontrolled in-migration with opening of roads to forest area and overloading of social infrastructure?		√	Not applicable to this site. Further, only certain amount of tourists are expected to visit the site.
• Occupational health hazards due to fugitive dust, materials handling, noise, or other process operations?	√		An emergency handling and management plan comprising of EHS procedures will be in place to meet such contingencies.
• Disruption of transit patterns, creation of noise and congestion, and pedestrian hazards aggravated by heavy trucks?		√	The subproject is confined to a clear cut markings separating the location from it's surrounding.
• Disease transmission from inadequate waste disposal?		√	Adequate care will be taken so that waste is collected and disposed in a safe manner meeting the CPCB / TNPCB guidelines.

Appendix 6: SEMI-ANNUAL ENVIRONMENTAL MONITORING REPORT TEMPLATE

- Overall project description and objectives
- Environmental category as per ADB Safeguard Policy Statement, 2009
- Environmental category of each subproject as per national laws and regulations
- Project Safeguards Team

Name	Designation/Office	Email Address	Contact Number
1. PMU			
2. PIUs			
3. Consultants			

- Overall project and sub-project progress and status
- Description of subprojects (package-wise) and status of implementation (preliminary, detailed design, on-going construction, completed, and/or O&M stage)

Package Number	Components/List of Works	Status of Implementation (Preliminary Design/Detailed Design/On-going Construction/Completed/O&M)[1]	Contract Status (specify if under bidding or contract awarded)	If On-going Construction	
				%Physical Progress	Expected Completion Date

[1] If on-going construction, include %physical progress and expected date of completion

COMPLIANCE STATUS WITH NATIONAL/STATE/LOCAL STATUTORY ENVIRONMENTAL REQUIREMENTS[2]

Package No.	Subproject Name	Statutory Environmental Requirements[3]	Status of Compliance[4]	Validity if obtained	Action Required	Specific Conditions that will require environmental monitoring as per Environment Clearance, Consent/Permit to Establish[5]

COMPLIANCE STATUS WITH ENVIRONMENTAL LOAN COVENANTS

No. (List schedule and paragraph number of Loan Agreement)	Covenant	Status of Compliance	Action Required

COMPLIANCE STATUS WITH THE ENVIRONMENTAL MANAGEMENT PLAN (REFER TO EMP TABLES IN APPROVED IEE/S)

- Confirm if IEE/s require contractors to submit site-specific EMP/construction EMPs. If not, describe the methodology of monitoring each package under implementation.

Package-wise Implementation Status

Package Number	Components	Design Status (Preliminary Design Stage/Detailed Design Completed)	Final IEE based on Detailed Design				Site-specific EMP (or Construction EMP) approved by Project Director? (Yes/No)	Remarks
			Not yet due (detailed design not yet completed)	Submitted to ADB (Provide Date of Submission)	Disclosed on project website (Provide Link)	Final IEE provided to Contractor/s (Yes/No)		

- Identify the role/s of Safeguards Team including schedule of on-site verification of reports submitted by consultants and contractors.

[2] All statutory clearance/s, no-objection certificates, permit/s, etc. should be obtained prior to award of contract/s. Attach as appendix all clearance obtained during the reporting period. If already reported, specify in the "remarks" column.
[3] Specify (environmental clearance? Permit/consent to establish? Forest clearance? Etc.)
[4] Specify if obtained, submitted and awaiting approval, application not yet submitted
[5] *Example: Environmental Clearance requires ambient air quality monitoring, Forest Clearance/Tree-cutting Permit requires 2 trees for every tree, etc.*

- For each package, provide name/s and contact details of contractor/s' nodal person/s for environmental safeguards.
- Include as appendix all supporting documents including **signed** monthly environmental site inspection reports prepared by consultants and/or contractors.
- With reference to approved EMP/site-specific EMP/construction EMP, complete the table below
- Provide the monitoring results as per the parameters outlined in the approved EMP (or site-specific EMP/construction EMP when applicable).
- In addition to the table on EMP implementation, the main text of the report should discuss in details the following items:

  (i) **Grievance Redress Mechanism.** Provide information on establishment of grievance redress mechanism and capacity of grievance redress committee to address project-related issues/complaints. Include as appendix Notification of the GRM (town-wise if applicable).

  (ii) **Complaints Received during the Reporting Period.** Provide information on number, nature, and resolution of complaints received during reporting period. Attach records as per GRM in the approved IEE. Identify safeguards team member/s involved in the GRM process. Attach minutes of meetings (ensure English translation is provided).

  - Confirm if any dust was noted to escape the site boundaries and identify dust suppression techniques followed for site/s.
  - Identify muddy water was escaping site boundaries or muddy tracks were seen on adjacent roads.
  - Identify type of erosion and sediment control measures installed on site/s, condition of erosion and sediment control measures including if these were intact following heavy rain;
  - Identify designated areas for concrete works, chemical storage, construction materials, and refueling. Attach photographs of each area.
  - Confirm spill kits on site and site procedure for handling emergencies.
  - Identify any chemical stored on site and provide information on storage condition. Attach photograph.
  - Describe management of stockpiles (construction materials, excavated soils, spoils, etc.). Provide photographs.
  - Describe management of solid and liquid wastes on-site (quantity generated, transport, storage and disposal). Provide photographs.
  - Provide information on barricades, signages, and on-site boards. Provide photographs.
  - Provide information on
  - Checking if there are any activities being under taken out of working hours and how that is being managed.

Summary of Environmental Monitoring Activities (for the Reporting Period)[12]

Impacts (List from IEE)	Mitigation Measures (List from IEE)	Parameters Monitored (As a minimum those identified in the IEE should be monitored)	Method of Monitoring	Location of Monitoring	Date of Monitoring Conducted	Name of Person Who Conducted the Monitoring
Design Phase						
Pre-Construction Phase						
Construction Phase						
Operational Phase						

[12] Attach Laboratory Results and Sampling Map/Locations

Overall Compliance with CEMP/ EMP

No.	Sub-Project Name	EMP/ CEMP Part of Contract Documents (Y/N)	CEMP/ EMP Being Implemented (Y/N)	Status of Implementation (Excellent/ Satisfactory/ Partially Satisfactory/ Below Satisfactory)	Action Proposed and Additional Measures Required

APPROACH AND METHODOLOGY FOR ENVIRONMENTAL MONITORING OF THE PROJECT

- Brief description on the approach and methodology used for environmental monitoring of each sub-project

MONITORING OF ENVIRONMENTAL IMPACTS ON PROJECT SURROUNDINGS(AMBIENT AIR, WATER QUALITY AND NOISE LEVELS)

- Brief discussion on the basis for monitoring
- Indicate type and location of environmental parameters to be monitored
- Indicate the method of monitoring and equipment to be used
- Provide monitoring results and an analysis of results in relation to baseline data and statutory requirements

As a minimum the results should be presented as per the tables below.

Air Quality Results

Site No.	Date of Testing	Site Location	Parameters (Government Standards)		
			PM10 µg/m3	SO2 µg/m3	NO2 µg/m3

Site No.	Date of Testing	Site Location	Parameters (Monitoring Results)		
			PM10 µg/m3	SO2 µg/m3	NO2 µg/m3

Water Quality Results

Site No.	Date of Sampling	Site Location	Parameters (Government Standards)					
			pH	Conductivity µS/cm	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L

Site No.	Date of Sampling	Site Location	Parameters (Monitoring Results)					
			pH	Conductivity µS/cm	BOD mg/L	TSS mg/L	TN mg/L	TP mg/L

Noise Quality Results

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Government Standard)	
			Day Time	Night Time

Site No.	Date of Testing	Site Location	LA_{eq} (dBA) (Monitoring Results)	
			Day Time	Night Time

SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS

- Summary of follow up time-bound actions to be taken within a set timeframe.

APPENDIXES

- Photos
- Summary of consultations
- Copies of environmental clearances and permits
- Sample of environmental site inspection report
- Other

SAMPLE ENVIRONMENTAL SITE INSPECTION REPORT

Project Name
Contract Number

NAME: _____ DATE: _____
TITLE: _____ DMA: _____
LOCATION: _____ GROUP: _____

WEATHER CONDITION:
_____

INITIAL SITE CONDITION: _____

CONCLUDING SITE CONDITION:

Satisfactory _____ Unsatisfactory _____ Incident _____Resolved _____ Unresolved _____

INCIDENT:
Nature of incident:
_____

Intervention Steps:
_____

Incident Issues

Resolution

Project Activity Stage	Survey	
	Design	
	Implementation	
	Pre-Commissioning	
	Guarantee Period	

Inspection

Emissions	Waste Minimization
Air Quality	Reuse and Recycling
Noise pollution	Dust and Litter Control
Hazardous Substances	Trees and Vegetation

Site Restored to Original Condition Yes ☐ No ☐

Signature
_____

Sign off

_____ _____

Name **Name**
Position **Position**

Appendix 7: SAMPLE GRIEVANCE REGISTRATION FORM

(To be available in Local Language)

The Project welcomes complaints suggestions, queries and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback.
Should you choose to include your personal details but prefer to keep the information's remain confidential, please inform us by typing *(CONFIDENTIAL)* above your name. Thank you.

Date	Place of registration	
Contact Information / Personal Details		
Name	Gender: _Male _Female	Age:
Home Address		
Village / Town		
District		
Phone no.		
E-mail		
Complaint / Suggestion / Comment / Question Please provide the details (who, what, where and how) of your grievance below: If included as attachment/note/letter, please tick here:		
How do you want us to reach you for feedback or update on your comment/grievance?		

FOR OFFICIAL USE ONLY

Registered by: (Name of official registering grievance)			
Verified thru:	Note/Letter	E-mail	Verbal/Telephonic
Reviewed by: (Names/Positions of Official(s) reviewing grievance)			
Action taken:			
Whether Action Taken Disclosed:	Yes	No	
Means of Disclosure:			