Initial Environmental Examination

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IND: Infrastructure Development Investment Program for Tourism (IDIPT) Tranche 4
— Improvement at Tourist Guest House and Information Centre at Hogenakkal in Dharmapuri District, Construction of Banquet Hall & Tourist Hostel in District Town of Trichy and Renovation of Heritage Tourist Centre in Kanyakumari District

Package No. IDIPT/TN/T4/NCB/07/2017

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

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
PMSC	-	Project Management 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
PMSC	-	Project Management Consultant
PMU	-	Project Management Unit
RCC	-	Reinforced Cement Concrete
ROW	-	right-of-way
SPS	-	Safeguard Policy Statement

NOTE

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

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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. Project 2 includes the states of Uttarakhand and Tamil Nadu. Hogenakkal in Dharmapuri District, District Town of Trichy and Kanyakumari are some of the proposed beneficiary tourist destination in Tamil Nadu under tranche IV of the Sub Project.

Hogenakal Falls is a waterfall in South India on the Kaveri (or Cauvery) River. It is located in the Dharmapuri district of the southern Indian state of Tamil Nadu, about 180 kilometers (km) from Bangalore and 46 km from Dharmapuri town. It is sometimes referred to as the "Niagara of India" With its fame for medicinal baths and hide boat rides, it is a major site of tourist attraction. Carbonated rocks in this site are considered to be the oldest of its kind in South Asia and one of the oldest in the world.

Tiruchirappalli (formerly Trichinopoly in English), also called Tiruchi or Trichy, is a city in the Indian state of Tamil Nadu and the administrative headquarters of Tiruchirappalli District. It is the fourth largest municipal corporation and the fourth largest urban agglomeration in the state. Tiruchirappalli is one of the oldest inhabited cities in Tamil Nadu; its earliest settlements date back to the second millennium BC Uraiyur, the capital of the Early Cholas for 600 years from the 3rd century BC onwards, is a suburb of present-day Tiruchirappalli. The city is referred to as Orthoura by the historial Ptolemy his 2nd century work Geography. The world's oldest surviving dam, the Kallanai (Lower Anaicut) about 18 km from Uraiyur was built across the Kaveri River by Karikala Chola in the 2nd Century AD.

Kanyakumari is the southernmost point of peninsular India and the meeting point of three oceans-the Bay of Bengal, the Arabian Sea and the Indian Ocean. Besides its importance as a Hindu pilgrim center, it is famous for its beautiful views of sunrise and sunset over the waters. The multicoloured sand is a unique feature of the beach here. Kanyakumari is the southernmost district of Tamil Nadu. The district lies between 77° 15' and 77° 36' of the eastern longitudes and 8° 03' and 8° 35' of the northern Latitudes. The District is bound by Tirunelveli District on the North and the east. The South Eastern boundary is the Gulf of Mannar. On the South and the South West, the boundaries are the Indian Ocean and the Arabian Sea. On the West and North West it is bound by Kerala.

Executing and implementing agencies. The executing agency is the Department of Tourism & Culture, Government of Tamil Nadu. Project Management Unit (PMU) is set up at Chennai to coordinate the overall execution. The implementing agency is Project Implementation Unit (PIU) set up at Hogenekal by Tamilnadu Tourism Development Corporation (TTDC). To support the PIU, Project Management and Supervision Consultant (PMSC) have been placed. The asset owner is the Tamilnadu Tourism Development Corporation (TTDC).

Categorization. Subproject package IDIPT/TN/T4/NCB/07/2017 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 (i) the development of infrastructure

facilities in Hogenakkal. It involves provision of Tourism support infrastructure for the village of Hogenakkal, Dharmapuri District. It involves improvement at Tourist Guest House and Information Centre; (ii) Construction of Banquet Hall & Tourist Hostel at Trichy in Tamil Nadu. It involves provision of Tourism support infrastructure for TTDC Hotel Trichy; and (iii) Renovation of Heritage Tourist Centre in Kanyakumari District, Tamil Nadu.

Proposed subproject. The primary objective of this sub-project is to provide tourism support infrastructure for the village of Hogenakkal, Dharmapuri District thereby promoting sustainable economic growth through Tourism. The component proposed under this project is improvement at Tourist Guest House and Information Centre at Hogenakkal in Dharmapuri District, The sub project will also provide Tourism support infrastructure for TTDC Hotel, Trichy, Tiruchirappalli District thereby promoting sustainable economic growth through Tourism. The proposed subproject includes “Construction of Banquet Hall & Tourist Hostel in District Town of Trichy. As part of this sub project Renovation of Heritage Tourist Centre in Kanyakumari is also proposed which includes

(i) Renovation of Heritage Restaurant Building (Roofing, Flooring, Main Entrance Door, Doors & Windows, Brick work, Electrical Cables, Lights, Switches & Panels);
(ii) Renovation of Kitchen (Modular Kitchen);
(iii) Laying of Paver Block Edges with Kerb wall at Existing Road; and
(iv) Renovation of rooms in the Main block (Flooring & SS Handrail).

Description of Environment. Hogenakkal is a village in the Dharmapuri district of the Indian state of Tamilnadu. It is part of Koothapadi panchayat village within the Pennagaram sub-district of Dharmapuri district. It is located in the western part of the Dharmapuri district bordering Karnataka. Hogenakkal Falls is a waterfall in South India on the Kaveri River in the Dharmapuri district of the Indian state of Tamil Nadu. It is located 180 km (110 miles) from Bangalore and 46 km (29 miles) from Dharmapuri. Sometimes referred to as the "Niagara Falls of India," it is known for medicinal baths and hides boat rides, projecting itself as a major tourist attraction. Carbonatite rocks in this site are considered to be the oldest of its kind in South Asia and one of the oldest in the world. The Government of Tamil Nadu made a proposal to convert the falls into providing drinking water for the state.

Tiruchirappalli is situated in Central South-Eastern Tamilnadu, almost at the geographic centre of the state of Tamil Nadu. The Kaveri Delta begins to form 16 km west of the city where the river divides into two streams—the Kaveri and the Kollidam to form the island of Srirangam. By road it is 912 km, 322 km south-west of Chennai and 341 km south-east of Bangalore. The topology of Tiruchirappalli is almost flat, with an average elevation of 88 metres. A few isolated hillocks rise above the surface, the highest of which is the Rockfort; its estimated age of 3,800 million years makes it one of the oldest rocks in the world. Other prominent hillocks include the Golden Rock, Khajamalai, and one each at Uyyakondan Thirumalai and Thiruverumbur. The two major rivers draining Tiruchirappalli are the Kaveri and its tributary the Kollidam, but the city is also drained by the Uyyakondan Channel, Koraiyar and Kudamuritti river channels.

In Kanyakumari district Soil is mostly of the red loam variety. However on the sea coasts, the sandy type of soil prevails and, near the mountain ranges, gravelly soil is generally seen. In low lands there is neither white sand nor sandy loam, while in the midlands and high lands there prevails fairly fertile soil of the fine type. Based on a 50 year study, it is found that during the North-East monsoon, between October and December, a precipitation of 549 millimeters is received in 24 rainy days and during the South-West Monsoon 537 millimeters is received

from June to September in 27 rainy days. The major river in the district is Thamirabarani River locally known as Kuzhithuraiar. This river has two major tributaries with the Pechiparai Dam and Perunchani Dam respectively built across them, Kodayar and Paralayar. The forests of the district are administered through the Kanyakumari Forest Division, with headquarters at Nagercoil, the capital of Kanyakumari District.

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 Project Management and Supervision Consultants (PMSC). Further, the environmental monitoring plans provide adequate opportunities towards course correction to address any residual impacts during construction or operation stages.

Tranche 4 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 Tamil Nadu-Infrastructure Development Investment Program for Tourism (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 Infrastructure Development Investment Program for Tourism (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 and PMSC will be responsible for environmental monitoring. The PIU, with support from the PMSC will submit semi-annual monitoring reports to the PMU. The PMU will consolidate the semi-annual reports in assistance of PMSC and will 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. 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.

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 (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. Project 2 includes the states of Uttarakhand and Tamil Nadu. Hogenekkal is one of the unexploited tourist centre which is famous for its waterfall in Dharamapuri district in Tamil Nadu and has been considered under tranche IV of the Sub Project.

4. Hogenakkal a village in the Dharmapuri district of the Indian state of Tamil Nadu. It is part of Koothapadi panchayat village within the Pennagaram sub-district of Dharmapuri district. It is located in the western part of the Dharmapuri district bordering Karnataka. Hogenakkal is a hot spot for film makers. Hogenakkal Falls is a waterfall in South India on the Kaveri river in the Dharmapuri district of the Indian state of Tamil Nadu. It is located 180 kilometers (km) (110 miles [mi]) from Bangalore and 46 km (29 mi) from Dharmapuri. Sometimes referred to as the "Niagara Falls of India," it is known for medicinal baths and hide boat rides, projecting itself as a major tourist attraction. Carbonatite rocks in this site are considered to be the oldest of its kind in South Asia and one of the oldest in the world.

5. Tiruchirappalli is situated in Central South-Eastern India, almost at the geographic centre of the state of Tamil Nadu. The Kaveri Delta begins to form 16 km. west of the city where the river divides into two streams—the Kaveri and the Kollidam to form the island of Srirangam. By road it is 912 km., 322 km. south-west of Chennai and 341 km. south-east of Bangalore. The topology of Tiruchirappalli is almost flat, with an average elevation of 88 meters. A few isolated hillocks rise above the surface, the highest of which is the Rockfort; its estimated age of 3,800 million years makes it one of the oldest rocks in the world. Other prominent hillocks include the Golden Rock, Khajamalai, and one each at Uyyakondan Thirumalai and Thiruverumbur. The two major rivers draining Tiruchirappalli are the Kaveri and its tributary the Kollidam, but the city is also drained by the Uyyakondan Channel, Koraiyar and Kudamuritti river channels.

6. Kanyakumari is the southernmost district of Tamil Nadu. The district lies between 77o 15' and 77o 36' of the eastern longitudes and 8o 03' and 8o 35' of the northern Latitudes. The District is bound by Tirunelveli District on the North and the east. The South Eastern

boundary is the Gulf of Mannar. On the South and the South West, the boundaries are the Indian Ocean and the Arabian Sea. On the West and North West it is bound by Kerala.

7. **Executing and implementing agencies.** The executing agency is the Department of Tourism & Culture, Government of Tamil Nadu. Project Management Unit (PMU) is set up at Chennai to coordinate the overall execution. The implementing agency is Project Implementation Unit (PIU) will be set up at Hogenekkal by Tamilnadu Tourism and Development Corporation (TTDC) through Department of Tourism (DOT). To support the PIU, Project Management and Supervision Consultant (PMSC) is proposed to be placed. The asset owner is Tamilnadu Tourism and Development Corporation (TTDC).

8. **Proposed subproject.** The primary objective of this sub-project is to increase visits of domestic and international tourists to tourist destinations. The Sub-project “Improvement at Tourist Guest House and Information Centre at Hogenakkal in Dharmapuri District.” consists of (a) Construction of a building consisting of four VIP suites (b) Dividing a Dormitory at the boys hostel to individual rooms (c) Provision of approach road with Paver blocks. Hogenakkal falls is sometimes referred to as the "Niagara of India", with its fame for medicinal baths and hide boat rides, it is a major unexploited tourist attraction. Carbonated rocks in this site are considered to be the oldest of its kind in South Asia and one of the oldest in the world. The project will further increase the tourist attractions having all facilities which will induce economic upliftment of local communities by generating self-employment opportunities. The sub project will assist design and implement capacity building measures for the community and the stakeholders.

9. Another location at Trichy, the sub-project is to provide Tourism support infrastructure for TTDC Hotel, Trichy, Tiruchirappalli District thereby promoting sustainable economic growth through Tourism. The proposed subproject includes “Construction of Banquet Hall & Tourist Hostel in District Town of Trichy. The aim is to increase visits of domestic and international tourists to tourist destinations.

10. Development of Infrastructure of Kanyakumari District will help in promoting sustainable economic growth through Tourism. The following is proposed under this report “Renovation of Heritage Tourist Centre in Kanyakumari”:

(i) Renovation of Heritage Restaurant Building (Roofing, Flooring, Main Entrance Door, Doors & Windows, Brick work, Electrical Cables, Lights, Switches & Panels);
(ii) Renovation of Kitchen (Modular Kitchen);
(iii) Laying of Paver Block Edges with Kerb wall at Existing Road; and
(iv) Renovation of rooms in the Main block (Flooring & SS Handrail).

11. The IEE is 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).

12. **Categorization.** Subproject package IDIPT/TN/T4/NCB/07/2017 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.

13. Under the EIA Notification, 2006 promulgated under Environment (Protection) Act 1986 of the Ministry of Environment and Forests (MOEF), Government 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.

14. 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 MoEF on the recommendations of an Expert Appraisal Committee (EAC) to be constituted by the Central Government for the purposes of this Notification.

15. 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 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.

16. **Purpose of the Initial Environmental Examination.** The IEE was based on a careful review of subproject site plans, detailed design and reports, defined management plans, field visits, stakeholder consultations/discussions and secondary data to characterize the environment and identify potential impacts. The adverse environmental impacts for this contract package are primarily related to

(i) the Improvement at Tourist Guest House and Information Centre at Hogenakkal in Dharmapuri District." consists of (a) Construction of a building consisting of four VIP suites (b) Dividing a Dormitory at the boys hostel to individual rooms (c) Provision of approach road with Paver blocks";
(ii) Construction & Improvement Works of TTDC Hotel at Trichy, Tiruchirappalli district, TamilNadu; and
(iii) Renovation of Heritage Tourist Centre in Kanyakumari.

17. Therefore, as per the Asian Development Bank's (ADB) Environmental Assessment Guidelines (SPS 2009), the sub-project 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 with this report.

II. DESCRIPTION OF THE SUBPROJECT

A. Existing Condition and Need of the Subproject

18. **Location.** Hogenakkal is a village in the Dharmapuri district of the Indian state of Tamil Nadu. It is part of Koothapadi panchayat village within the Pennagaram sub-district of Dharmapuri district. It is located in the western part of the Dharmapuri

district bordering Karnataka. Hogenakkal Falls is a waterfall in South India on the Kaveri River in the Dharmapuri district of the Indian state of Tamil Nadu. It is located 180 km (110 mi) from Bangalore and 46 km (29 mi) from Dharmapuri.

Figure 1: Site Map of Hogenakkal Hotel TTDC

19. Tiruchirappali is located at 10.8050°N 78.6856°E. The city is at a distance of 325 km. south-west of Chennai and 402 km. north of Kanniyakumari on the National Highway NH 45 and 200 km. south-east of Coimbatore and 128 km (80 miles [mi]) west from the Bay of Bengal coast. The city of Madurai is situated 161 km. south of Tiruchirappalli. TTDC Hotel is exactly located at 10.798337°N 78.306825°E and it is about 500m from the Tiruchirappalli Central Bus Stand.

Figure 2: Site Map of TTDC Hotel

20. Kanyakumari is the southernmost district of Tamil Nadu. The district lies between 77o 15' and 77o 36' of the eastern longitudes and 8o 03' and 8o 35' of the northern Latitudes. The District is bound by Tirunelveli District on the North and the east. The South Eastern

boundary is the Gulf of Mannar. On the South and the South West, the boundaries are the Indian Ocean and the Arabian Sea. On the West and North West it is bound by Kerala.

Figure 3: Site Map of TTDC Hotel at Kanyakumari District

21. **Brief History.** Dharmapuri District, on the northwestern part of Tamilnadu, was established on 2nd October 1965. River Cauvery flows on its western side. It is located between latitudes N 11 47° and 12 33 ° and longitudes E 77 02° and 78 40°. The total area of Dharmapuri District is 4,500 square kilometers. It is divided into Dharmapuri, Palacode, Pennagaram, Harur, Pappireddipatti Taluks. 70% of the work force is dependent on Agriculture and Mango Production fills the Horticultural side. Inland Fishing is another avenue for revenue.

22. Pennagaram, Harur and Palacode blocks are famous for its High Quality Black Granite. Quartz is available in Kendiganapalli, A.Velampatti, Pethampatti; and Malibdinum identified as Good Conductor is available in Harur. The climate of the Dharmapuri District is generally warm. Maximum Temperature is 38°C in April and Minimum Temperature is 17°C in January. Dharmapuri District receives an annual rainfall of 896 millimeters (mm). The District Population is 15,02,900 and the Town's Population is 2,60,381. On the Tourism Front Hogenakal and Theerthamalai are the most popular tourist and leisure locations in Dharmapuri District.

23. The Kaveri is considered to form at Talakaveri in the Brahmagiri hills in the Western Ghats of south India and gathers momentum as the land drops in elevation. It becomes larger as various tributaries feed into it on the way down. At Hogenakkal, the Kaveri, now a large river, drops and creates numerous waterfalls as the water cuts through the rocky terrain. In places the water falls as much as 20 meters (m) and is said to sound like continual thunder. Soon after the falls the river takes a southerly course and enters the Mettur Stanley Reservoir. The river carries sediment which makes the down river land fertile.

24. Tiruchirappalli's recorded history begins in the 3rd century BC, when it was under the rule of the Cholas. The city has also been ruled by the Pandiyas, Pallavas, Vijayanagar Empire, Nayak Dynasty, the Carnatic state and the British. The most prominent historical monuments in

Tiruchirappalli include the Rockfort, the Ranganathaswamy temple at Srirrangam and the Jambukeswarar temple at Thiruvanaikaval. The archaeologically important town of Uraiyur, capital of the Early Cholas, is now a suburb of Tiruchirappalli. The city played a critical role in the Carnatic Wars (1746–1763) between the British and the French East India companies. According to Hindu Mythology, the word "Tiruchirappalli" is derived from "Tiru" which is to address someone with respect; "Chirapalli" is a compound of siram - head, palli - to sleep. It is a reference to the deity Sriranganathaswamy who is depicted at rest with his head in a slightly elevated position in the Srirangam Temple. Tiruchirappalli is one of the oldest inhabited cities in Tamil Nadu; its earliest settlements date back to the second millennium BC Uraiyur, the capital of the Early Cholas for 600 years from the 3rd century BC onwards, is a suburb of present-day Tiruchirappalli. The city is referred to as Orthoura by the historial Ptolemy his 2nd century work Geography. The world's oldest surviving dam, the Kallanai (Lower Anaicut) about 18 km from Uraiyur was built across the Kaveri River by Karikala Chola in the 2nd Ventury AD.

25. The medieval history of Tiruchirappalli begins with the reign of the Pallava king Mahendravarman I, who ruled over South India in the 6th century AD and constructed the rock-cut cave-temples within the Rockfort. Following the downfall of the Pallavas in the 8th century, the city was conquered by the Medieval Cholas, who ruled until the 13th century.

26. Kanyakumari pronunciation, also known as Kanniyakumari, formerly known as Cape Comorin, is a town in Kanyakumari District in the state of Tamil Nadu in India. The name comes from the Devi Kanyakumari temple in in the region. It is the southernmost tip of peninsular India. Kanyakumari town is the southern tip of the Cardamom Hills, an extension of the Western Ghats range. Ptolemy's geography describes commercial relations between western India and Alexandria, the chief eastern emporium of the Roman Empire. He identified Kanyakumari along with the Gulf of Mannar as a center for pearl fishery. He also identifies Korkai (assumed to be the present day's Tuticorin), a place to the east of Kanyakumari, as an emporium of pearl trade. Another ancient Greek book, the Periplus of the Erythraean Sea, contains sailing directions for merchants from the Red Sea to the Indus and Malabar, and even indicates that the coast from Barygaza (Baroch) had a general southward direction down to and far beyond Cape Komari.

27. Kanyakumari District consists of those parts known locally as Nanjil Nadu and Idai Nadu. The names of the villages of the district such as Azhagiapaandipuram, Bhoothapandy, Cholapuram and Kulasekaram reveal that these places were governed by several rulers at different periods of time. Nanjil Nadu was under the rule of Pandiyas till the early 10th century and then under Cheras. The Kalkulam and Vilavancode Taluks were under the rule of the Chera Dynasty. When the power of Chola declined due to the rise of Hoysalas and western Chalukyas, the Venad (Travancore) Chieftains (descendants of the central Chera family) took advantage of the situation and gradually established their hold on considerable areas in Nanjil Nadu. Veera Kerala Varma, one such chieftain, styled himself as "Nanjil Kuravan". The annexation commenced by Veera Kerala Varma was to a large extent continued by his successors and completed by AD 1115.

28. For about four centuries, the Venad was ruled by powerful kings who were consistently making incursions into the Pandian territories. As a result, Vijayanagar kings proceeded against Venad. In 1609 Kanyakumari fell into the hands of Viswanatha Nayak of Madurai. Consequent on this, there was no serious threat to Nanjil Nadu until 1634. During the regime of Ravi Varma and Marthanda Varma, Venad was disturbed by the internal strife. Sanda Sahib of Arcot took advantage of this situation and attacked Nanjil Nadu. Although Marthanda Varma was victorious in the battle of Colachel and defeated the Dutch armouries who helped the local feudatories, he

could not cope with the threat from Sanda Sahib, which forced him to withdraw from the battlefield. After Marthanda Varma, Venad had weak rulers and as a result there was frequent interference by the British (who knew it as Cape Comorin) whose control was completely established over Venad and continued until 1947. From 1947 to 1956, it was under the personal rule of Maharaja of Travancore. During the period between 1956–1961, the administrative system has fallen in line with that of other districts in Tamil Nadu.

29. Kanyakumari is famous for its beautiful views of sunrise and sunset over the waters. The multicoloured sand is a unique feature of the beach here.

30. **Existing Conditions.** The property at Hogenekal belongs to Tamil Nadu Tourism Development Corporation (TTDC). The existing hotel facilities in the hotel for the tourists may not cater to the requirements. The works for construction, improvements & up gradation to the hotel complex is considered as part of the proposal and recommendation of local authorities & from the line department.

31. Trichy is an important educational centre in the state of Tamil Nadu, and houses nationally recognised institutions such as the Indian Institute of Management (IIMT), Indian Institute of Information Technology (IIIT) and National Institute of Technology (NITT). Industrial units such as Bharat Heavy Electricals Limited (BHEL), Golden Rock Railway Workshop and Ordnance Factory Tiruchirappalli (OFT) have their factories in Tiruchirappalli. The presence of a large number of energy equipment manufacturing units in and around the city has earned it the title of "Energy Equipment and Fabrication Capital of India". Tiruchirappalli is internationally known for a brand of cheroot known as the Trichinopoly cigar, which was exported in large quantities to the United Kingdom during the 19th century.A major road and railway hub in the state, the city is served by an international airport which operates flights to Southeast Asia and the Middle East. This property belongs to Tamil Nadu Tourism Development Corporation. The existing accommodation facilities in the hotel for the tourists are not sufficient. Hence, provision of additional rooms is considered.

32. Kanyakumari district is the southernmost district in Tamil Nadu state and mainland India. It is the second largest district in the state population density. The district headquarters is Nagercoil. It is one among the biggest tourism place in Tamilnadu. There are several places to visit Kanyakumari like (Sea Coastal area, Padmanabhapuram Palace, Vattakottai Fort, Vivekananda Rock Memorial). Generally, People have been satisfied with Atmosphere, Climatic conditions Infrastructure development, Hotels & Hospitality. Most of the tourists prefer to stay at Kanyakumari since it is one of the Sea Costal place in Tamil Nadu, hence, Tamilnadu Tourism Development Corporation has decided to renovate the hotel in Kanyakumari and to provide accommodation for the tourists from different economic backgrounds. Tourists are staying in private hotels at Kanyakumari with high cost and lower standard facilities. 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 essential to have a hotel operated by the Government body to provide accommodation with modern facilities at a reasonable cost to people and it has to be helpful to develop the tourism area.

33. **Proposed Subproject.** The primary objective of the project at Hogenekal is Construction & Improvements of works in the subproject proposed area. In consideration of the tourist significance of the place and the huge inflow of visitors with expected enhanced revenue to the tourism sector, it calls for adequate accommodations to meet the requirement of the public as well as towards enhanced tourism environment. It aims to provide tourist infrastructure facilities along with protecting the value of the property and will further enhance the tourist

attractions with all facilities. Project will promote community-based tourism and generation of livelihood for local communities ensuring gender equality and will help educate visitors about the tourist attractions.

34. Project at Trichy is Construction & Improvements of works in the subproject proposed area. In consideration of the tourist significance of the place and the huge inflow of visitors with expected enhanced revenue to the tourism sector, it calls for adequate accommodations to meet the requirement of the public as well as towards enhanced tourism environment. It aims to provide tourist infrastructure facilities along with protecting the value of the property and will further enhance the tourist attractions with all facilities. Project will promote community-based tourism and generation of livelihood for local communities ensuring gender equality and will help educate visitors about the tourist attractions.

35. Objective of project at Kanyakumari is to improve the existing Infrastructure which is inadequate to cater the needs of the tourist. It becomes imperative to improve the basic amenities to the public. Some of the key interventions and improvements that have a direct bearing on the tourist well being are listed below :

(i) To renovate the Heritage Restaurant Building, Kitchen, Main block & Road in TTDC hotel; and
(ii) To provide accommodation with modern facilities at a reasonable cost to the tourists at Kanyakumari.

Upgradation of existing heritage restaurant building:

(i) Replacements of the existing Mangalore tiles in the roof with new Quilon make Mangalore tiles & Ridge tiles;
(ii) Replacement of entrance steps with granite finish & replacement of entrance aluminium door with teak wood decorative panelled shutter;
(iii) Replacement of entrance side old model windows with UPVC sliding windows. Removing the unwanted doors in the veranda and provisional store & closing with brickwork;
(iv) Removing the hand wash basins in the west side of the restaurant and converting the area as store room;
(v) Replacement of the old vitrified floor tiles (Matt finish) changed to Nano polished vitrified tiles in the restaurant, dining hall & veranda area;
(vi) Replacement of the old ceramic tile flooring change to vitrified tiles (Matt finish) in the store rooms & pantry;
(vii) Replastering the old damaged wall surfaces in the restaurant inside & outside area;
(viii) Provision for modular kitchen with wall tiles and Kota stone flooring in the kitchen area;
(ix) Removing the masonry platform, sink platform & oven platforms in the kitchen and dish wash area;
(x) Replacement of light fittings with LED lights and modular switches;
(xi) Replacement of electrical cables and panel boards;
(xii) Provision of kitchen equipment such as SS burners, ranges, sink, working platform, vegetable racks, cutting tables etc.; and
(xiii) Provision of wall painting, door painting, varnishing etc.

Improvements to the road

(i) Providing paver block road in front of the restaurant connecting the cape hotel

building and up to family room block;

(ii) Provision of concrete Kerb wall arrangements on edges of the paver block;

(iii) Provision of premix carpet in the existing bituminous road inside complex area; and

(iv) Painting the Kerb walls with enamel paints.

Improvements to the Main block rooms

(i) Replacement of ceramic tiles flooring changed to double charged vitrified tiles in the first floor rooms of Main Block (12 rooms);

(ii) Replacement of aluminium hand rails changed to SS hand rails in the ground floor rooms & first floor rooms of Main block (24 rooms); and

(iii) Painting the sit out areas after patching of plastering works.

36. All sites for subproject are owned by government thus no land acquisition or NOC is required. The sites are not within or adjacent to any protected area. Location map of proposed site is shown in Figure 4. 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 of TTDC and local communities. Accordingly, an EMP has been prepared for each component to mitigate any adverse impacts that may occur during implementation of the project.

37. 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 4: Proposed Site Location - Hogenekal

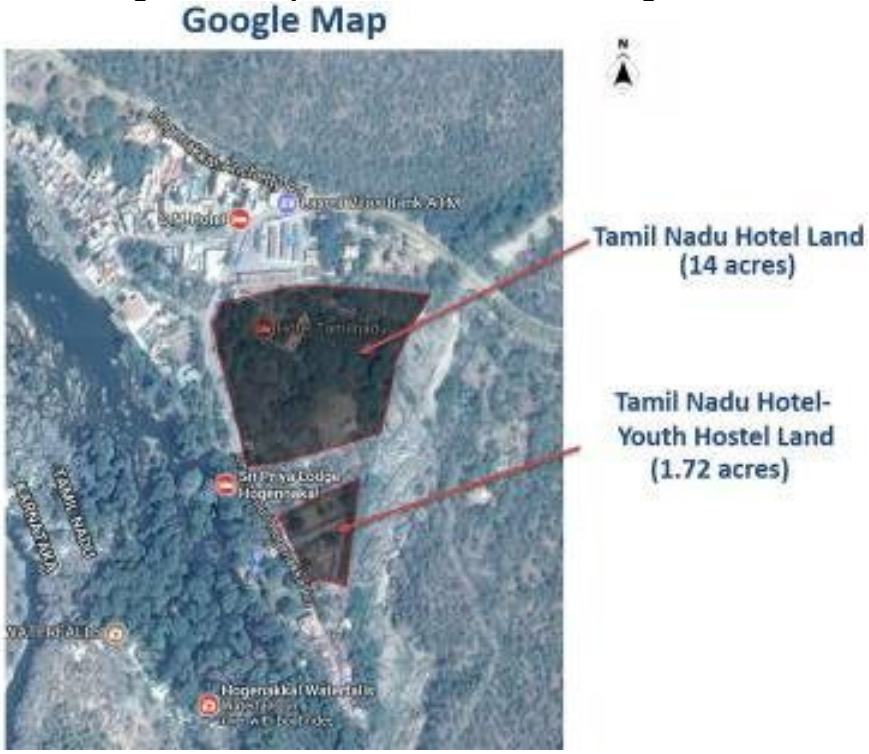


Figure 5: Proposed site plan subproject components - Trichy

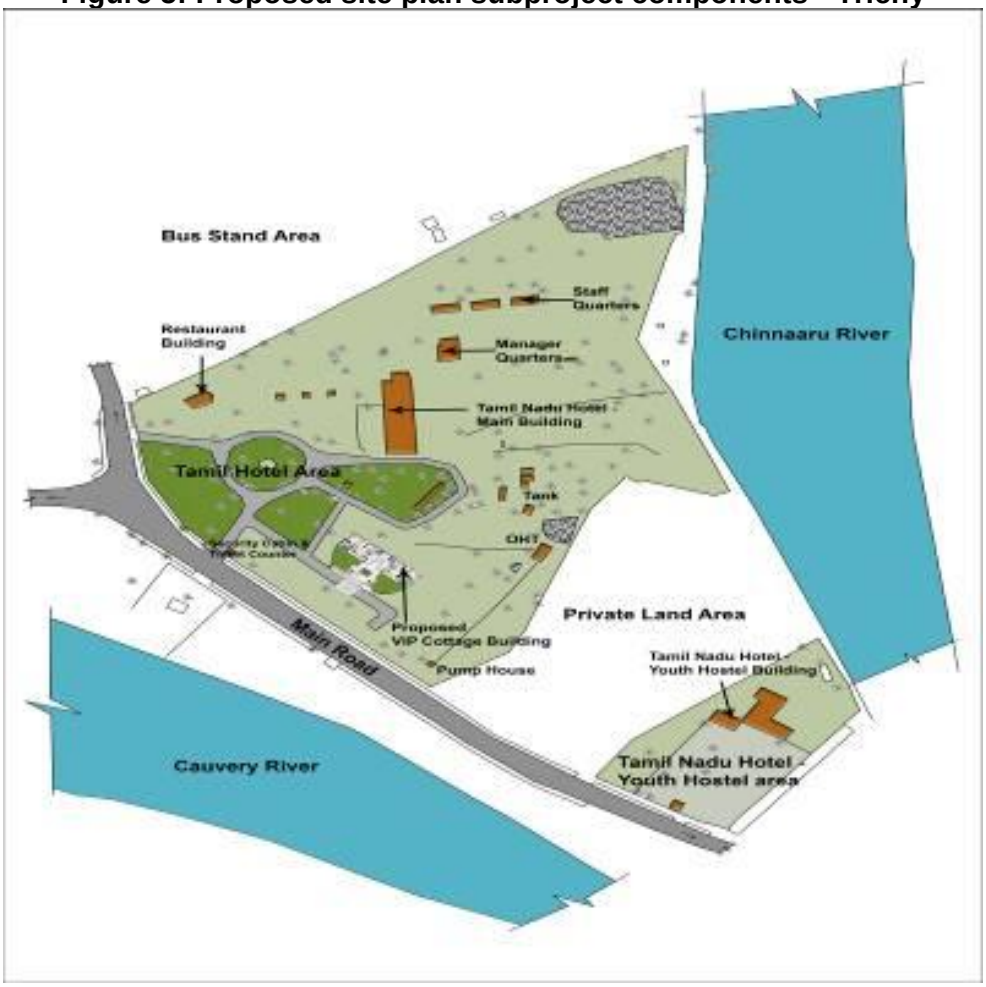


Figure 6: Proposed site location – Kanyakumari

B. Implementation Schedule

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

39. 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

40. 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.

41. **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

42. **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.

43. **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.

44. 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)

45. 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.

46. 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

47. 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.

48. 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 categories1 - 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.

49. It may be noted that Prima facie applicable laws, notifications, policies etc. those may be relevant in the context of the implementation of the proposed sub-project activities are briefly presented below. During the course Initial Environmental Examination, the applicability of these

[1] 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.

laws, regulations, policies etc. has been verified and their applicability matrix has been presented below.

50. The IEE has been prepared considering the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013 (Act 30 of 2013), Government of India and ADB's Policies for Social and Environmental Safeguards. The Department of Tourism and HR&CE will ensure compliance of legal and regulatory framework during the project cycle. 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 those are binding on the contractor has been briefed below.

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 Sub-project 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. This is not applicable as there is no forest land involved for the project development. Permission and clearance for cutting and transportation of trees will be required from Divisional Forest Officers, which is not applicable for this sub-project.
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. This is not applicable as there is no wildlife protected area is involved for the project development.
5	Coastal Regulation Zone (CRZ) Notification	1991 and 2011	Under the Environment Protection Act, 1986 a notification was issued in February 1991, for regulation of activities in the coastal area by the Ministry of Environment and Forests (MoEF). As 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

	Acts and Rules	Year	Compliance Criteria
			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 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 involves repairing and maintenance of the existing Jetty and enhancing the site by placing lighting, furniture, toilet facility etc. for the convenience of tourists and does not involve any new developments. Hence, does not come under the purview of CRZ regulations.
6	Water (Prevention and Control of Pollution) Act	1974	The Sub-projects 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. But, it is being ensured that no discharges will be there to any inland water bodies or

	Acts and Rules	Year	Compliance Criteria
			sea/ocean, hence this Act will not be applicable. Moreover, the excreta from the toilets will be collected in sewer line wherever possible for remaining places septic tanks/soak pits were used ensuring no discharges to water bodies.
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. This act will be applicable to the project during construction phase of projects as use of DG sets is being envisaged.
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. This act will apply to the project especially during the construction phase if such machineries will be used which is unlikely.
9	Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013 (Act 30 of 2013), Government of India	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 existing 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 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 project as materials will be procured from 3rd party licensed holders.

51. 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.

52. 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.

53. However, 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 / sub project. 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.

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

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

56. 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.

57. 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.

58. 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

59. Dhramapuri district has a wide range of soil types. The soil, in general, is low in nitrogen and phosphate content. Red loamy soil is found in Hosur, Shoolagiri, Thally and Kelamangalam blocks. Lateritic and sandy coastal alluvium soils are found in almost all blocks. Black soil is seen in Dharmapuri and Krishnagiri taluks. Red & sandy soil is found in Hosur and Harur taluks.

60. Hogenakkal is situated on the border of Tamilnadu & Karnataka, 46kms from Dharmapuri and 180 Km from Bangalore. One of the major rivers of India and a perennial river of south India, the Cauveri flows through and make the soil fertile. The river plays major role in making the states of Karnataka and Tamil Nadu prosper as it passes through the region. Kudagu in Karnataka is where the Cauveri originates as a small stream and gathers momentum and gets bigger on their way down. It is in Hogenakkal that the Cauveri enters Tamil Nadu as a big river with gushing waters which presents a waterfall. Hogenakkal falls is sometimes referred to as the "Niagara of India", with its fame for medicinal baths and hide boat rides, it is a major

unexploited tourist attraction. Carbonated rocks in this site are considered to be the oldest of its kind in South Asia and one of the oldest in the world. The subproject site is in the possession of the Tamilnadu Tourism and Development Corporation (TTDC) and thus the site does not require 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 within existing boundary.

61. Tiruchirappalli is situated in Central South-Eastern India, almost at the geographic centre of the state of Tamil Nadu. The Kaveri Delta begins to form 16 km. west of the city where the river divides into two streams—the Kaveri and the Kollidam—to form the island of Srirangam. By road it is 912 km. south of Hyderabad, 322 km.south-west of Chennai and 341 km. south-east of Bangalore. The topology of Tiruchirappalli is almost flat, with an average elevation of 88 m above MSL. A few isolated hillocks rise above the surface, the highest of which is the Rockfort; its estimated age of 3,800 million years makes it one of the oldest rocks in the world. Other prominent hillocks include the Golden Rock, Khajamalai, and one each at Uyyakondan Thirumalai and Thiruverumbur. The two major rivers draining Tiruchirappalli are the Kaveri and its tributary the Kollidam, but the city is also drained by the Uyyakondan Channel, Koraiyar and Kudamuritti river channels. The land immediately surrounding the Kaveri River—which crosses Tiruchirappalli from west to east - consists of deposits of fertile alluvial soil on which crops such as finger millet and maize are cultivated. Further south, the surface is covered by poor-quality black soil. A belt of Cretaceous rock known as the Trichinopoly Group runs to the north-east of the city, and to the South-East there are layers of archaean rocks, granite and gneiss covered by a thin bed of conglomeratic laterite. The region falls under Seismic Zone III, which is moderately vulnerable to earthquakes.

62. The city of Tiruchirappalli lies on the plains between the Shevaroy Hills to the north and the Palani Hills to the South and South-west. Tiruchirappalli is completely surrounded by agricultural fields. Densely populated industrial and residential areas have recently been built in the northern part of the city, and the southern edge also has residential areas. The older part of Tiruchirappalli, within the Rockfort, is unplanned and congested while the adjoining newer sections are better executed. Many of the old houses in Srirangam were constructed according to the Shilpa Sastras, the canonical texts of Hindu temple architecture. The subproject site is in the possession of the Tamilnadu Tourism and Development Corporation (TTDC) and thus the site does not require 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 within existing boundary. There are no impacts envisaged on land acquisition or resettlement due to the proposed subproject components.

63. Kanyakumari is surrounded by Majestic Hills and the plains bordered by colourful sea-shores, fringed with coconut trees and paddy fields, here and there are few elevated patches of red cliffs with undulating valleys and plains between the mountainous terrain and the sea - coast, so closely interwoven with Temples and Churches and other edifices lies the district, 'Kanniyakumari'. With an area of 1672 sq.km. it occupies 1.29% of the total extent of Tamil Nadu. It ranks first in literacy among other districts in Tamil Nadu. The subproject site is in the possession of the Tamil Nadu Tourism Development Corporation (TTDC) and thus the site does not require 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.

1. Climate

64. The climate of the Dharmapuri District is generally warm and is classified as tropical. The summers here have a good deal of rainfall, while the winters have very little. This location is classified as Aw by Köppen and Geiger. The temperature here averages 26.8 °C. The average annual rainfall is 896 mm. Maximum Temperature is 38°C in April and Minimum Temperature is 17°C in January. Dharmapuri. The District Population is 15,02,900 and the Town's Population is 2,60,381. On the Tourism Front Hogenakal and Theerthamalai are the most popular tourist and leisure locations in Dharmapuri District.

65. Tiruchirappalli experiences a tropical savanna climate with no major change in temperature between summer and winter. The climate is generally characterised by high temperature and low humidity. With an annual mean temperature of 28.9 °C (84.0 °F) and monthly average temperatures ranging between 25 °C (77 °F) and 32 °C (90 °F), the city is the hottest in the state. The warmest months are from April to June, when the city experiences frequent dust storms. As of November 2013, the highest temperature ever recorded in Tiruchirappalli was 43.9 °C (111.0 °F), which occurred on 2 May 1896; the lowest was observed on 6 February 1884 at 13.9 °C (57.0 °F). The high temperatures in the city have been attributed to the presence of two rivers - Kaveri and Kollidam and the absence of greenery around the city. Rainfall is heaviest between October and December because of the north-east monsoon winds, and from December to February the climate is cool and moist. The average annual rainfall is 841.9 mm (33.15 in), slightly lower than the state's average of 945 mm (37.2 in). Fog and dew are rare and occur only during the winter season.

66. Mean average temperature recorded in Kanyakumari 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.

2. Geographical features

67. Dharamapuri district lies between 11”47’ & 12”33’ degrees of northern latitude and 77”28’ and 76”45’ degrees of eastern longitude. Tiruchirappali is located at 10.8050°N 78.6856°E. The city is at a distance of 325 km south-west of Chennai and 402 km north of Kanniyakumari on the National Highway NH 45 and 200 km south-east of Coimbatore and 128 kilometres (80 mi) west from the Bay of Bengal coast.

68. The forests in this district are verdant and virgin forests and are believed to be seventy five million years old. Out of the total district area of 1,67,130 hectares, the government forests cover an area of fifty thousand four hundred and eighty four hectares. It is about 30.2 percent of the total geographical area of the district. Unlike other districts, this district receives a fair amount of rainfall from both South-West and North-East monsoons. The period of South-West monsoon is from the month of June to September, while the North-East monsoon is from the month of October to December. Rivers also form a major source of irrigation in the district of Kanyakumari and the major rivers in this district are Thamiraparani, Valliar, Pazhayar, Ponniavaikal and Paraliyar.

69. The district's coastal environment forms an interface between land and marine water. This eco-system is valuable to humans from the dawn of civilization. The biological and social needs of human beings are readily met by coastal zone. This district in Tamil Nadu with a land mass of one thousand six hundred and eighty four square kilometres has almost all ecosystems; wetlands, forests, freshwater resources, marine, etc. The coastal environment is very important with regard to fish production and fisher folk's employment. The district's coastal ecosystem is sixty eight kilometres in length and is studded with forty four coastal fishing villages. Since this district is located at the extreme south of the Indian subcontinent, the coastline is formed nearly by three seas; the Arabian Sea, the Indian Ocean and the Bay of Bengal while the main part of the coast of Kanyakumari district faces the Arabian Sea.

3. Accessibility

70. The nearest airport to Hogenekaal is the Bangalore International Airport which is about 150 km away. Regular bus services are available from the Dharmapuri Bus Stand and the Salem Bus Stand are the two nearest Bus Stations. The nearest railway station to Hogenakkal is the Dharmapuri railway Station which is about 47 km away and taxis are easy to find. Hogenakkal, being a hill station, does provide some commuting options.

71. The Tiruchirappalli sits at the confluence of two major National Highways - NH 45 and NH 67. NH 45 is one of the most congested highways in South India and carries almost 10,000 lorries on the Tiruchirappalli - Chennai stretch every night. Other National Highways originating in the city are NH 45B, NH 210 and NH 227. State highways that start from the city include SH 25 and SH 62. Tiruchirappalli has 715.85 km of road maintained by the Municipal Corporation. A semi-ring road connecting all the National Highways is being constructed to ease traffic congestion in the city. As of 2013, approximately 3,28,000 two-wheelers 93,500 cars and 10,000 public transport vehicles operate within the city limits, apart from the 1,500 Inter-city buses that pass through Tiruchirappalli daily. Tiruchirappalli suffers from traffic congestion mainly because of its narrow roads and absence of an integrated bus station. The most commonly used modes of local transport in Tiruchirappalli are the state government-owned Tamil Nadu State Transport Corporation (TNSTC) buses, and auto rickshaws. Tiruchirappalli forms a part of the Kumbakonam division of the TNSTC. The city has two major bus termini; Chatram Bus Stand and Central Bus Stand, both of which operate intercity services and local transport to suburban areas.

72. Thiruvananthapuram (Trivandrum) airport in the neighbouring state Kerala is the nearest international airport, with direct flights from the Middle East, Singapore, Maldives and Sri Lanka. And is served by Air-India, among others. From Thiruvananthapuram (Trivandrum) it takes about three hours by bus, train, or taxi. Taxi fares are very reasonable, at about Rs 9-10 per km, and should be around Rs1,000 (US$16 Approx), for a trip to Kanyakumari from the Thiruvananthapuram International Airport.

73. Kanyakumari is very well connected and serviced by rail to all major cities in India like Chennai, Trivandrum, Kochi, Bangalore, Bombay, New Delhi, Kolkata, Coimbatore etc. And from here starts longest train route in India, Kanyakumari to Dibrugarh. Buses are frequently available from Thiruvananthapuram, the closest major transport hub. Long distance buses are available from Chennai (Madras), Coimbatore, Madurai, Bangalore etc.

4. Geomorphology

74. In Dharamapuri district, Pennagaram, Harur and Palacode blocks are famous for its High Quality Black Granite. Quartz is available in Kendiganapalli, A.Velampatti, Pethampatti; and Malibdinum identified as Good Conductor is available in Harur.

75. The entire Tiruchirappalli district constitutes a peneplain. The Kolli Hills in the north-western part and Pachchamalai Hills in the north-eastern parts of the district constitute the remnants of the denuded Eastern Ghats and rise to a height of more than 100 m above Mean Sea Level. From these hills, the land slopes gently toward east and forms a vast stretch of plain country. There are numerous small residual hillocks dotting the countryside, the most prominent one of which is the Rock Fort hill in Tiruchchirappalli town. The master slope of the district is towards east. The prominent geomorphic units identified in the district through interpretation of Satellite Imagery are 1) Alluvial Plains, 2) Valley Fills, 3) Buried Pediments, 4) shallow Pediments, 5) Pediments and 6) Structural Hills. The alluvial plains are confined to the northern bank of Cauvery River in the district.

76. Kanyakumari district is bordered by Western Ghats (Ridge and valley complex) in the West. Western Ghats form an elevation of 200 m amsl from these foothills in the west. The areas gently slope to southeast towards the Gulf of Mannar attaining an elevation of 25 to 30 m amsl. The eastern and central tracts are quite barren, but there are a few isolated knife edged hillocks. The coastal tracts are occupied by the marshy swamps and number of sand dunes (Teri sands). The prominent geomorphic units identified in the district through interpretation of Satellite imagery are 1) Structural Hills 2) Bazada 3) Valley Fill, 4) Flood Plain 5) Pediment, 6) Shallow Buried Pediments, 7) Deep Buried Pediments, and 8) Coastal Plain.

5. Soil

77. The soils of Dharmapuri district can be classified into i) Red Soil, ii) Red lateritic soil, Brown soil and iv) Alluvial. The soils are mostly in-situ in nature, lateritic, earthy and pale reddish in colour. The type of soil in this district ranges from black to mixed loam. Red sandy soils are also seen in the Harur taluk. Black and loam soil are there in the Dharmapuri taluk. The soil is generally low in Phosphate and Nitrogen content.

78. The major soil types encountered in Tiruchirapalli district are black cotton soils, red sandy to loamy soils and alluvial soils. A thin layer of red sandy soils overlies the western and southern parts of the district. Alluvial soils of considerable thickness occur in the central part, particularly in Tiruchchirappalli, Kulithalai, Musiri and Lalgudi taluks. Black cotton soils are observed in the northern part., whereas red loamy soils occur in the hilly regions.

79. The soils of Kanyakumari district can be classified into i) Red Soil, ii) Red lateritic soil, (iii) Brown soil and iv) Coastal sand. The soils are mostly in-situ in nature, lateritic, earthy and pale reddish in colour. They are derived from laterisation of gneisses. The soils derived from gneisses are mostly brownish. The thickness of soils in the mounts is almost negligible whereas in the valleys it is around 2 m. The lateritic type of soil occurs in Thiruvattar, Munchirai, Kurunthancode, Rajakkamangalam, Killiyur, Thuckalay and Melpuram blocks. The mixed type of Red and alluvial soils, occur in Agastheeswaram and Thovala blocks. The coastal sand occurs in the western side of the district. The coastal alluvium sand is of high fertility.

6. Hydrogeology

80. The district is underlain by Archaean Crystalline formations with recent alluvial deposits of limited areal and vertical extents along major rivers. The important aquifer systems in the district are constituted by i) unconsolidated & semi consolidated formations and (ii) weathered and fractured crystalline rocks. In the areas underlain by crystalline rocks, occurrence of ground water is essentially limited to zone of weathering and fracturing. Generally the hard rock aquifers are heterogeneous in nature. Ground water occurs under phreatic condition in the weathered mantle and semi confined to confined condition in the fracture and fissured zones of these rocks.

81. The major part of the Tiruchchirappalli district is underlain by Archaean crystalline metamorphic complex. The important aquifer systems encountered in the district are classified into i) Fissured, fractured and weathered crystalline formations consisting of charnockites, Granite Gneisses and ii) Unconsolidated and semi-consolidated formations.

82. Kanyakumari district is underlain by both porous and fissured formations (Plate-II). The important aquifer systems in the district are constituted by i) unconsolidated & semi-consolidated formations and (ii) weathered, fissured and fractured crystalline rocks. In the areas underlain by crystalline rocks, occurrence of ground water is essentially limited to zone of weathering and fracturing. Generally, the hard rock aquifers are heterogeneous in nature, which is indicated by the variations in lithology, structure and texture. Ground water occurs under phreatic condition in the weathered mantle and semi-confined to confined conditions in the fracture and fissured zones of these rocks. Thickness of weathered material varied widely from less than a meter to more than 20 m. The depths to water levels in these formations vary from 8 to 18 m bgl. The depth of dug wells tapping crystallines are ranging from 10 to 20 m bgl.

7. Groundwater Quality

83. Dharmapuri district in Tamil Nadu has high concentration of fluoride in groundwater with high Calcium. Though, the contaminants in the ground water are close to the permissible limits, though it just exceeds the permissible level for drinking water in some cases. The entire district is having water scarcity and out of eight blocks, seven are over exploited and one is critical.

84. The chemical characteristics of ground water in the phreatic zone in Dharmapuri district has been studied using the analytical data of ground water samples collected from Network Hydrograph Stations of Central Ground Water Board. The study of quality of ground water in deeper aquifers in the district has been attempted using the data collected from exploratory bore/tube wells constructed in the district. Ground water in phreatic aquifers in Dharmapuri district in general, is colourless, odourless and slightly alkaline in nature. The specific electrical conductance of ground water in phreatic zone (in MicroSeimens at 25oC) during May 2006 was in the range of 320 to 6010 in the district. It is between 750 and 2250 µS/cm at 25oC in the major part of the district. Conductance below 750 µS/cm have been observed in ground water in only one sample is Dharmapuri block whereas conductance exceeding 2250µS/cm have been observed in parts of Papireddipatti, Pennagaram and Morappur block 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 in more than 90 percent of samples analysed. Total Hardness as CaCO3 is observed in all samples have within the excess of permissible limits in about 40 percent of samples analysed whereas Nitrate is found in excess of 45 mg/l in about 32 percent samples. The incidence of high total hardness is

attributed to the composition of litho units constituting the aquifers in the district, whereas the Nitrate pollution is most likely due to the use of pesticides and fertilizers for agriculture. With regard to irrigation suitability based on specific electrical conductance and Sodium Adsorption Ratio (SAR), it is observed that ground water in the phreatic zone may cause high to very high salinity hazard and medium to high alkali hazard when used for irrigation. Proper soil management strategies are to be adopted in the major part of the district while suing ground water for irrigation.

85. The estimation of groundwater resources for the district has shown that all block is under “Over Exploited” category. The shallow alluvial aquifers along Cauvery and Ponnaiyar rivers serve as an important source of drinking water irrigation development for Dharmapuri district. Dug wells are the most common ground water abstraction structures used for irrigation in the district. The yield of dug wells range from 150 to 200m3/day in weathered crystalline rocks and 20 to 200m3/day in recent alluvial formations along major drainage courses.

86. Ground water in phreatic aquifers in Tiruchchirappalli district, in general, is colourless, odourless and slightly alkaline in nature. The electrical conductivity of ground water in phreatic zone (in Microsiemens at 25o C) during May 2006 was in the range of 570 to 4550 µS/cm and major parts of the district are having the electrical conductivity above 1700 µS/cm. In general the ground water is suitable for drinking and domestic uses in respect of all the constituents except Fluoride of higher concentration at Siruganallur (1.85 mg/L) and at few places are having higher concentration of NO3 than BIS permissible limit.

87. Kanyakumari. The chemical characteristics of ground water in the phreatic zone in Kanyakumari district has been studied using the analytical data of ground water samples collected from Network Hydrograph Stations of Central Ground Water Board. The study of quality of ground water in deeper aquifers in the district has been attempted using the data collected from exploratory bore/tube wells constructed in the district. Ground water in phreatic aquifers in Kanyakumari district, in general, is colourless, odourless and slightly alkaline in nature. The specific electrical conductance of ground water in phreatic zone (in Micro Seimens at 25o C) during May 2006 was in the range of 150 to 2240 in the district. It is between 750 and 2250 µS/cm at 25o C in the major part of the district. Conductance below 750 µS/cm has been observed in ground water in parts of Marthandam, Attur, Villukuri and Chettiyarmadam.

88. 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 in more than 90 percent of samples analysed. Total Hardness as CaCO3 is observed in all samples have within the permissible limits analysed whereas Nitrate is found in excess of 45 mg/l in about 25 percent samples. The incidence of high total hardness is attributed to the composition of litho units constituting the aquifers in the district, whereas the Nitrate pollution is most likely due to the use of pesticides and fertilizers for agriculture. With regard to irrigation suitability based on specific electrical conductance and Sodium Adsorption Ratio (SAR), it is observed that ground water in the phreatic zone may cause high to very high salinity hazard and medium to high alkali hazard when used for irrigation. Proper soil management strategies are to be adopted in the major part of the district while suing ground water for irrigation.

8. Natural Disaster / Hazard

89. Dharmapuri District situated in TamilNadu is prone to multi hazards like earthquake, drought, flood, landslide and Road accidents. District Disaster management plan has been

developed which aims to improve district's response to disasters while improving its ability to mitigate the disaster risks and increasing community's resilience by implementing the preparedness plan. The plan also proposes dealing with disasters in an organized way with all the stake holders who should be well aware of their role in responding or preparing for disasters.

90. 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

91. The air environment of the sub project areas is generally found to be good and is free from pollution. The ambient air quality 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.

92. 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.

93. Most of the sub project 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.

94. 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.

95. 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 Sub-project Specific impacts and their mitigation measures).

96. 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

97. 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 as well reduced inflow of floating population.

2. Administration

98. Dharmapuri is the district headquarters. The district has been divided into two revenue divisions namely Dharmapuri and Harur consisting 5 taluks. Dharmapuri district is bifurcated into Dharmapuri and Krishnagiri districts on 9th February 2004. The present Dharmapuri district has 5 taluks namely Dharmapuri, Palakodu, Harur, Pappiredipatti and Pennagaram. Dharmapuri and Harur are the 2 revenue divisions in this district. At present, this district comprises of 486 Revenue Villages, 10 Town Panchayats, 2 Census Towns and 251 Village Panchayats. There is only one Municipality in this district. This district is also divided into 8 Community Development Blocks.

99. Important places to visit in Dharmapuri:

(i) **Hogenakkal Falls** is located in the Dharmapuri district. Medicinal baths, boat rides, oil massage, fish fry and Water fall from hills so it's a major tourist attraction. Sometimes referred to as the "Niagara Falls of India," Carbonatite rocks in this site are considered to be the oldest of its kind in South Asia and one of the oldest in the world. The Government of Tamil Nadu made a proposal to convert the falls into providing drinking water for the state. The Kaveri river flows into the state through the district, and Hogenakkal, a town situated 46km from Dharmapuri is the site where the river drops into as a scenic waterfall.

Figure 7: Hogenekkal Falls

(ii) **Hill-temple**: Theerthamalai in Harur taluk which is a sacred religious place for the Hindus, and which had been existent right from the times of the Chola and the Vijayanagara empires.

Figure 8: Theerthamalai Temple

(iii) **Adhiyamankottai** : Tourists visiting the site can see ruins of the roughly oval shaped fort. Another attraction close to this site is the Chenraya Perumal temple, which is believed to have been constructed by King Krishna Devaraya as well as the Hoysala kings. The MANDAPAM within the temple leads to the sanctum sanctorum, where tourists can see paintings depicting the scenes from the Mahabharata and the Ramayana. Also famous temple name called KALABAIRAVAR TEMPLE is located.

(iv) **Kottai Kovil** located on the northern side of Dharmapuri, is temple dedicated to Lord Shiva. This temple is known among the tourists for its rare sculptures and paintings. One of the highlights of this temple is the 'Hanging pillar'. As per the locale belief, a secret passage in this temple connects it to Adhiyamankottai

(v) **Vathalmalai or Vytla Hills** is a village in Dharmapuri taluk and Dharmapuri district in Tamil Nadu having an area measuring nearly 225 km². Most of the native flora and fauna of Vytla have disappeared due to severe habitat fragmentation resultant from the creation of the plantations. However, some species continue to survive and thrive in several protected areas nearby, include Sheverayan Hills (Yercaud). These protected areas are especially known for several threatened and endemic species including Nilgiri Thar, the Grizzled Giant Squirrel, the Nilgiri Wood-pigeon, the Gaur, wild pig, the Nilgiri langur, the Sambar, and the Neelakurinji (that blossoms only once in twelve years). It is a small village situated at 3600 ft height (MSL). It is 25 km away from Dharmapuri Town (17km to reach bottom of the hill and 8km to hill top).

(vi) **Dharmapuri Archaeological Museum**: Many historical things available in this museum.

(vii) **Sri Hanuman (Anjaneya) Temple** at Muthampatti which is located 14 Kms from Dharmapuri City. The temple is located in Forest near Muthampatti Railway Station (2Kms) and a very peaceful place. We can also Feed Monkeys. Really we can get Peace of Mind. Also Nagavadhi Dam, Thoppayaru Dam (Located nearby Thoppur,Dharmapuri) and many more dams are in Dharmapuri to visit.

3. Area Population

100. According to 2011 census, Dharmapuri district had a population of 1,506,843 with a sex-ratio of 946 females for every 1,000 males, much above the national average of 929. A total of 167,940 were under the age of six, constituting 87,777 males and 80,163 females. The current average literacy of the district was 91.2% compared to the national average of 72.99%. The district had a total of 375,873 households. There were a total of 751,170 workers, comprising 191,080 cultivators, 217,062 main agricultural labourers, 11,308 in house hold industries, 233,546 other workers, 98,174 marginal workers, 10,248 marginal cultivators, 50,283 marginal agricultural labourers, 4,033 marginal workers in household industries and 33,610 other marginal workers.

4. Languages

101. The inhabitants of the District speak different languages. The predominant communities found in this area are the Kapus, Lingayaths, Okkaligas, Baliya Chetties, Oddars and Scheduled Castes like Holeyas and Madigas. The weavers of this area mostly belong to Sali Chetties. The Baramahal area comprising eastern part of the Dharmapuri taluk constitutes Telugu and Tamil speaking communities, majority of whom

belong to Vanniars, The Malayali tribe is inhabited in the Chitheri Hills areas. Among the Scheduled Caste population Adi-Dravidars and Arunthathiars form major share who are scattered throughout the district.

5. Sanitation and Sewage Disposal

102. 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

103. 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.

7. Site Details

104. 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 PMSC has carried out a field visit and has interacted with the local officials.

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 9: Proposed Site Location of Cottage Building at TTDC Hotel, Hogenakkal

Figure 10: TTDC Hotel, Hogenakkal - Existing Main Block, Hogenakkal

C. Socio-economic and Cultural Environment

1. Trade and Commerce

105. During British rule, Tiruchirappalli was known for its tanneries, cigar-manufacturing units and oil presses. At its peak, more than 12 million cigars were manufactured and exported annually. Tanned hides and skins from Tiruchirappalli were exported to the United Kingdom. The city has a number of retail and wholesale markets, the most prominent among them being the Gandhi Market, which also serves people from other parts of the district. Other notable markets in the city are the flower bazaar in Srirangam and the mango market at Mambazha Salai. The suburb of Manachanallur is known for its rice mills, where polished *Ponni* rice is produced.

106. Tiruchirappalli is a major engineering equipment manufacturing and fabrication hub in India. The Golden Rock Railway Workshop, which moved to Tiruchirappalli from Nagapattinam in 1928, is one of the three railway workshop–cum–production units in Tamil Nadu. The workshops produced 650 conventional and low-container flat wagons during 2007–2008.

2. Administration

107. Tiruchirappalli City Municipal Corporation Council, the legislative body, comprises 65 councillors elected from each of the 65 wards and is headed by a mayor assisted by a Deputy Mayor. The executive wing has seven departments—general administration, revenue, town planning, engineering, public health, information technology and personnel—and is headed by a City Commissioner. The Commissioner is assisted by two executive engineers for the east and west sections, and Assistant Commissioners for personnel, accounts and revenue departments, a public relations officer, a city engineer, a city health officer and an Assistant Commissioner for each of the four zones. A Local Planning Authority for Tiruchirappalli was created on 5 April 1974 as per the Tamil Nadu Town and Country Planning Act of 1971 with the District Collector

of Tiruchirappalli as chairman and the Assistant Director of Town and Country Planning as its member secretary.

108. Important places and landmarks in Trichy

109. Once a part of the Chola kingdom, Tiruchirappalli has a number of exquisitely sculpted temples and fortresses. Most of the temples, including the Rockfort temples, the Ranganathaswamy Temple at Srirangam, the Jambukeswarar Temple at Thiruvanaikkaval, the Samayapuram Mariamman Temple, the Erumbeeswarar Temple,Ukrakaliamman temple in Tennur and the temples in Urayur, are built in the Dravidian style of architecture; the Ranganathaswamy Temple and Jambukeswarar Temple are often counted among the best examples of this style. The rock-cut cave temples of the Rockfort, along with the gateway and the Erumbeeswarar Temple, are listed as monuments of national importance by the Archaeological Survey of India.

(i) Considered one of the symbols of Tiruchirappalli, the Rock fort is a fortress which stands atop a 273-foot-high rock. It consists of a set of monolithic rocks accommodating many rock-cut cave temples. The temple complex has three shrines, two of which are dedicated to Lord Ganesha, one at the foot and the Ucchi Pillayar Temple at the top, and the Thayumanavar Temple between them. The Thayumanavar temple, the largest of the three, houses a shrine for Parvati as well as the main deity. The Rock fort is visible from almost every part of the city's north. The Teppakulam at the foot of the Rock fort is surrounded by bazaars. It has a mandapa at its centre and has facilities for boat riding.

(ii) The Ranganathaswamy Temple, dedicated to the Hindu god Vishnu, is located on the island of Srirangam. Often cited as the largest functioning Hindu temple in the world, it has a perimeter of 4,116 m and occupies 156 acres (630,000 m2). Considered to be among the 108 Divya Desams (Holy shrines of Lord Vishnu), the temple is believed to house the mortal remains of the Vaishnavite saint and philosopher Ramanujacharya. Originally built by the Cholas, the temple was later renovated by the Pandyas, the Hoysalas, the Madurai Nayaks and the Vijayanagar empire between the 9th and 16th centuries AD. There are 21 Gopurams (towers), of which the Rajagopuram is 236 feet (72 m). According to the Limca Book of Records, it was the tallest temple tower in the world until 1999.

Figure 11: Ranganathaswamy Temple

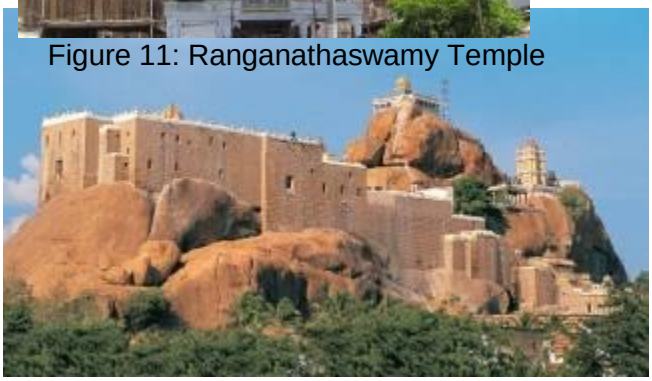


Figure 12: Rockfort temple

(iii) The Jambukeswarar Temple at Thiruvanaikkaval and the Erumbeeswarar Temple at Thiruverumbur were built in the rule of

the Medieval Cholas. The Jambukeswarar Temple is one of the Pancha Bhoota Stalams dedicated to Lord Shiva; it is the fifth largest temple complex in Tamil Nadu. The city's main mosque is the Nadir Shah Mosque or Nathar Shah mosque, which encloses the tomb of the 10th century Muslim saint Nadir Shah. The Christ Church constructed by the German Protestant missionary Christian Friedrich Schwarz in 1766 and the Our Lady of Lourdes Church are noted examples of Gothic Revival architecture in the city.

(iv) The Chokkanatha Nayak Palace, which houses the Rani Mangammal Mahal, was built by the Madurai Nayaks in the 17th century; it has now been converted into a museum. The Nawab's palace, the Railway Heritage Centre, the Upper Anaicut constructed by Sir Arthur Cotton, and the world's oldest functional dam, the Grand Anaicut, are some of the other important structures in Tiruchirappalli.

3. Area Population

110. According to the 2011 Indian census, Tiruchirappalli had a population of 8,47,387 9 living in 2,14,529 families within the municipal corporation limits. The recorded population density was 5,768/km2 while the sex ratio was 975 males for every 1,000 females. The Tiruchirappalli urban agglomeration had a population of 1,022,518, and was ranked the fourth largest in Tamil Nadu and the 53rd in India as of 2011. The city had an average literacy rate of 91.37%, significantly higher than the national average of 73.00%. There were 2,28,518 people, roughly constituting about 26.96% of the total population, who lived in slums in the city. The daily floating population of the city was estimated at around 250,000.The city's population is predominantly Hindu. Twenty percent are Muslims and there is also a considerable Christian population. Sikhs and Jains are present in smaller numbers.

4. Languages

111. The most widely spoken language is Tamil, but there are significant numbers of Telugu, Gujarati, Kannada, Malayalam and Hindi speakers. The standard dialect of Tamil spoken is the Central Tamil dialect. Saurashtra is spoken by the Patnūlkarars who migrated from Gujarat in the 16th century. There is also a substantial population of Anglo-Indians and Sri Lankan Tamil migrants, most of whom are housed in refugee camps on the outskirts of the city.

5. Sanitation and Sewage Disposal

112. The Underground Sewerage Scheme for Trichy-Srirangam Corporation of the town of 67.87 sq. km. is handled completely by TWAD board. The town is divided into 9 zones. The sewage generated from each zone is collected through a network of street sewers and conveyed to the pumping station in the respective zones. The sewage collected in each zone is pumped to the sewage treatment plant constructed at Panjapur village adopting Waste Stabilization Pond technology, for treatment of sewage. The treated effluent is let into the natural channel near the STP site and utilized for Agriculture. The total length of sewers laid is 183.27 KM with 7216 manholes. The total number of house service connections is 23775.

6. Solid Waste Management

113. Solid waste management in the city is handled by the corporation. About 400 tones of solid waste are released from city every year. The principal garbage dumping ground is at Ariyamangalam. Recently, the Tiruchirappalli city corporation has gone in for scientific closure

of the garbage dump and its replacement with a sewage treatment plant. Waste water management in the Trichy-Srirangam underground drainage (UGD) areas are handled by the Tamil Nadu Water Supply and Drainage Board (TWAD) and in other areas by the Tiruchirappalli Municipal Corporation. The high toxicity of the waste water released by the Trichy Distilleries and Chemicals Limited (TDCL) is a major cause of concern for the corporation. The corporation's annual expenditure for the year 2010-11 is estimated to be Rs. 155.94 Crores.

7. Site Details

114. 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 PMSC has carried out a field visit and has interacted with the local officials. Refer to the figures below for the photographs taken during site visit. Refer Figure 15 below for the google map image of the site location and Figure 16 for the proposed site layout plan.

Table 3: 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 13: TTDC Hotel, Trichy - Old block Close View Showing the Extent of Dilapidation

Figure 14: TTDC Hotel, Pictures taken during site visit

Figure 15: Google image of the site layout

Figure 16: Proposed Site Layout Plan

D. Socio-economic and Cultural Environment

1. Trade and Commerce

115. Kanyakumari is mainly an agricultural district. Its prosperity is, therefore mainly dependent on the development of agricultural resources. Intensive efforts are being made to raise the yield of different crops by adopting modern methods of cultivation. But agriculture alone cannot contribute to increase the incomes of the local people, since the area of cultivation is limited in relation to its growing population. Therefore, it is imperative that secondary sectors, particularly cottage industries, are also developed in order to provide employment opportunities to the unemployed. Village industries may be defined as those that manufacture articles needed in the villages utilizing tools and implements, raw materials, and human or animal power which are locally available. These industries play a vital role in the district in view of their capacity to generate employment opportunities in the rural sector at a low capital cost, developing local initiative, co-operation and a spirit of self reliance in the economy, helping in the utilization of the available manpower for processing locally simple techniques, offering employment at the place of residence to a large section of rural population and providing seasonal part time employment to the rural people suffering from unemployment owing to the seasonal character of agricultural operations.

116. Further, cottage industries require lesser gestation period and produce goods required by the common man. They are eminently suited for initiating the process of industrialization in the backward areas of the district on a dispersed basis and they have the capacity to rectify the regional imbalances. These industries have, therefore, been accorded an important place in this credit plan with a view to achieve rapid industrialization of rural areas. For a long time, the district has been the land of cottage industries. This sector has been providing employment to a large number of people.

117. The rural industries have been facing problems in getting adequate finance. Availability of bank finance at a reasonable rate of interest will save artisans from the clutches of money-lenders and wholesale traders who charge usurious rates of interest. The Khadi and Village Industries Commission and Tamilnadu Khadi and Village Industries Board provide assistance to artisans by way of loans for meeting working capital requirements and also for the purchase of tools and implements in the cases of selected industries. Besides these, they also assist the respective industries in marketing their products, in training their artisans and in promoting research in the production techniques. Kanyakumari district has got an area of 1684.17 sq.km . This district is rich in resources derived from land, sea and forest. The urban area is reported to be 43 sq.km. But the rural areas cover a total of 1641sq.km . However, around 49354 hectares are reported to be forest lands. It has been endowed with a coastline of about 68 kms. Generally speaking, the people of this district are hard working. With higher percentage of literacy, the people of this district have a lure for white collar jobs, particularly government jobs. Hence they are not interested in taking up industrial ventures. One of the main bottlenecks which hamper the growth of industries in this district is the non-availability of vacant lands for setting up industries. The high cost of land also contributes to low development of industries in this district. Though this district has got enough raw materials and infrastructural facilities, it has to take a seat in the back bench in the field of industrial development.

118. According to a report, 1,18,387 fisher-folks are distributed in the 44 villages of Kanyakumari coast which constitute about 26% of the total fishermen of Tamil Nadu. Fisher folks do not own land but put their hut on the seashore on unsurveyed land. Most of the villages are having tiled and thatched roofs. In each village a few houses have concrete roofing; the

owners of these houses are working in some other countries as drivers, crane operators, etc. A few educated fishermen settled down in the inland are doing teaching and other office jobs. Still, the economy of the coastal villages is not satisfactory. The marine capture fisheries sector has an important place in the district's economy. It is sad to note that, among the fisherman population, only 44% is fully employed, 52% occasionally and 4% partially. The fishing job may not be secure during lean season particularly during June. The mechanised boats can catch 15,000 to 25,000 kg of fish per day. But during non-seasonal months the catch per boat will be 700-8000 kg /day. It has been recorded that in seasonal landings in Kanyakumari fishing village nearly 81,000 kg per month was obtained.

2. Administration

119. Following the judicial separation of the Kanyakumari district of the territorial dominions transferred to the then Madras state (former state in the Republic of India) from the former United State of Travancore and Cochin during the year 1956, the administration frame of the local bodies then in existence were countenanced to proceed till 31st of March 1962. The Tamilnadu Panchayats Act, 1958 was implemented in the Kanyakumari district effective from the 1st April 1962. A district collector was appointed to the district of Kanyakumari with the responsibility of heading the district. Even today, the district collector, typically appointed by the Tamil Nadu Government to the district of Kanyakumari is the head of the district. The district collector is assisted by various officers of different departments towards the general administration of Kanyakumari. The set of revenue department officers who normally assist the Kanyakumari district collector include sub collector, district revenue officer, revenue divisional officer, district adi dravidar welfare officer, district backward classes welfare officer, excise department assistant commissioner, tahsildar, taluk supply officers, special tahsildars, divisional excise officers and many other officers.

120. Important places to visit in Kanyakumari district:

(i) **Mahatma Gandhi Memorial:** The place has been associated with great men like Swami Vivekananda and Mahatma Gandhi in whose names memorials have been here. They are very beautiful and add to the attraction of this place. The beautiful Gandhi Memorial completed in 1956, is situated as a memorial to the Father of the Nation. An urn of Mahatma Gandhi was kept here for public to pay homage before immersion. Mahatma Gandhi visited Kanyakumari twice in 1925 and 1937. Mahatma Gandhi visited Kanyakumari in January 1937. In 1948 his ashes were immersed in the sea waters in Kanyakumari. In commemoration of this event a beautiful monument has been constructed here.

(ii) **Thiruvalluvar Statue:** Thiruvalluvar is the immortal poet of Tamil Nadu and has given to the world Thirukkural. The memorial statue of Thiruvalluvar is in Kanniyakumari. The pedestal of the statue is of 38 feet height and the statue over it is 95 feet tall with a grand total of 133 feet for the entire sculpture. The 3 tier pedestal known as Atharapeedam is surrounded by an artistic Mandapa known as Alankara Mandapam with 38 feet height**.**

(iii) **Kamarajar Manimandapam :** Another monument Kamarajar Manimandapam was raised and dedicated to Late. Sri. Kamarajar, The freedom fighter, Former Chief minister of Tamil Nadu, President of Indian National Congress. He was popularly known as Black Gandhi among the masses and king maker during congress regime. This monument was constructed where his ashes were kept

here for public to pay homage before immersion into the sea. Visting Hours -7 AM To 7 PM. Entrance Free**.**

(iv) **Vivekananda Rock Memorial.** Vivekananda Rock Memorial is another place in Kanniyakumari which attracts large number of tourists. As its name implies, it is essentially a sacred monument, built by the Vivekananda Rock Memorial Committee to commemorate the visit of Swamy Vivekananda to “Shripada Parai” during 24th, 25th and 26th December 1892 for deep meditation and enlightenment. From very ancient times, the rock has been regarded as sacred place. In Puranic tradition, it has been known as “Sripada Parai: meaning the rock that has been blessed by the touch of Shripada feet of the Goddess. On the rock, is a projection similar in form to a human fort and a little brownish in complexion, which has traditionally, been revered as a symbol of Shripadam. According to legend, it was on this rock that Goddess Kanyakumari did Tapas.

(v) **Suchindrum.** Suchindrum is a small village about 12 km. from Kanniyakumari and about seven kilometres from Nagercoil. This holy place is located on the bank of the river Pazhayar, adjoining fertile fields and coconut groves and the temple is dedicated to Sri Sthanumalayan. The word denotes Siva, Vishnu and Brahma as. Sthanu represents Siva, Mal represents Vishnu while Ayan represents Brahma i.e. Siva, Vishnu and Brahma in “One Form”.

(vi) **Kanyakumari Bhagavathi Amman temple.** Kanyakumari derives its name from Goddess Kanyakumari Amman, the presiding deity of the area. The most prominent temple, the Kumari Amman, is dedicated to the goddess Parvathi as a virgin. The temple situated at the edge of the ocean for Goddess Kanyakumari has the legendary account that once Banusura, the demon king got supremacy over Devas and meted out cruel punishment to them. Timings from 4.30 AM to 12.15 PM & 4.PM to 8.15 PM. Annual Festivals are Car festival (May / June) and Navaratri (Nine Days) Festival (September / October).

(vii) **Udayagiri Fort.** The fort was rebuilt in the reign of Marthandavarma, the Venad King, during 1741-44. Under the supervision of De Lannoy, the Belgian General, who served as the Chief of the Travancore army; East India Company’s troops were stationed there till the middle of the 19th century. Foundry for the manufacture of guns, mortars and cannon balls were also established within the fort under the supervision of the General. Now, the District Administration, with the help of Forest Department has set up a Biodiversity Park over here. Tourists can see deer, ducks, fountains, birds and over 100 varieties of trees inside the fort.

3. Area Population

121. Demographics of Kanyakumari reflect the characteristic features of the entire population of the district. According to the 2001 India census report, Kanniyakumari had an approximate population of 16,76,034 and the average literacy rate of this district is 91.11% that is considered to be the highest rate in the state. Kanyakumari is said to be Tamilnadu third most advanced district.

4. Languages

122. The languages, which are mostly spoken by the Residents of Kanyakumari, are Tamil and Malayalam. The people staying in the urban areas have a good knowledge of English.

5. Sanitation and Sewage Disposal

123. The process currently adopted in the city for sewage disposal is through septic tanks and public conveniences. The same shall be maintained for this site.

6. Solid Waste Management

124. The process currently adopted in the city with regard to solid waste disposal is that the solid waste is being collected by the municipality and dumped in dump yards and / or is being incinerated in the open.

7. Site Details

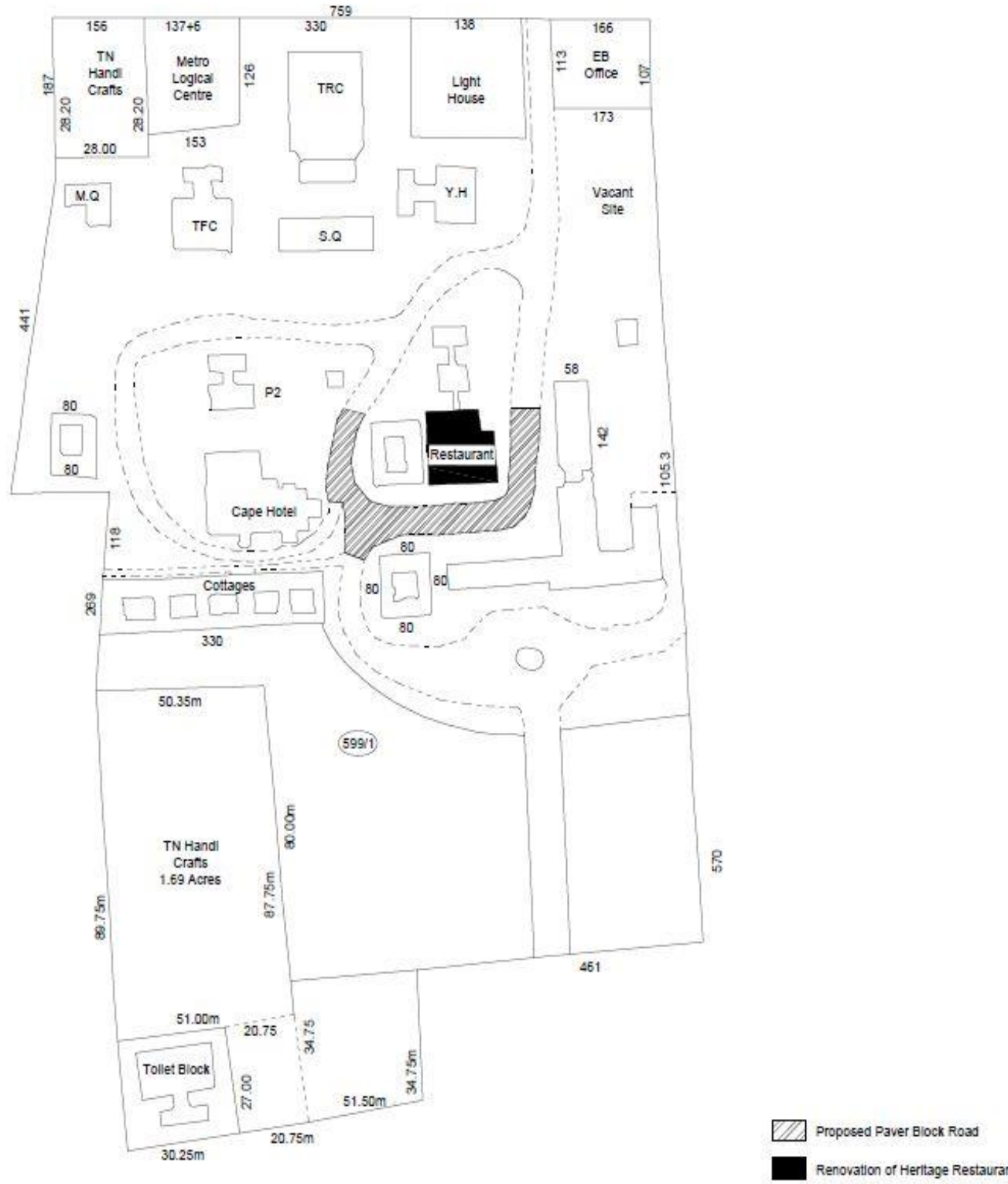
125. The site is free from encumbrances and is freely available with the Government of Tamil Nadu. Further, there is no necessity of any utility shifting and cutting of trees. The DSC has carried out a field visit and has interacted with the present manager of the Tamil Nadu Hotel.

Table 4: Site Details

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

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

Figure 17: Site Layout



V.

VI. ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

126. 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.

127. The proposal envisages medium scale construction activity onsite. The total built-up area proposed for the project site is 698.8 sq.m (7522.2 sq.ft). 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.

128. **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.

129. 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.

130. **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 lanPMSCape 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

131. 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;

132. 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

133. **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.

134. **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

135. **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.

136. **Utilities**. Interruption of services (water supply, toilets, bathing areas, etc.) will be scheduled and intermittently related to localized construction activities. To mitigate impacts, PIU/PMSC 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 PMSC the list of affected utilities and operators;
(iv) If relocations are necessary, contractor along with PIU/PMSC will coordinate with the providers/line agencies to relocate the utility.

137. **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/PMSC 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.

138. **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 PMSC and PIU.

139. **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/PMSC.
(iii) If additional quarries are required after construction has started, obtain written approval from PIU/PMSC.
(iv) Submit to PIU/PMSC on a monthly basis documentation of sources of materials.

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

141. **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.

142. Summary of pre-construction activities is presented in Table 5. 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 Appendixes 3 and 4.

Table 5: 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 Project Management and Supervision Consultant (PMSC) the list of affected utilities and operators;

Parameters	Mitigation Measures
	• Prepare a contingency plan to include actions to be done in case of 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 PMSC 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/PMSC. • If additional quarries are required after construction has started, obtain written approval from PIU/PMSC. • Submit to PMSC 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

143. The impacts during the construction of the sub project components 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 PMSC. 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.

144. 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.

145. 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.

146. 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.

147. 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.

148. **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.

149. **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/PMSC 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.

150. **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.

151. **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 6 (typical noise levels of principal construction equipment).

Table 6: 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

Clearing		**Structure Construction**	
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		LANPMSCAPING 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

152. 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/PMSC 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.2
(xii) Ensure vehicles comply with Government of India noise limits for vehicles. The test method to be followed shall be IS:3028-1998.

153. **Impacts on Flora and Fauna**. As per preliminary design, tree-cutting is not required. This will be reassessed during detailed design phase. There are no protected areas in the direct and indirect impact zones and no diverse ecological biodiversity is found within project area. Therefore, no mitigation measures are required from construction works. To safeguard the interest of this facility and because of its recreation value for the tourists, it is proposed to take

[2] 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.

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. 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 PMSC 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.

154. **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.

155. 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.

156. **Impacts on Socio-Economic Activities**. Manpower will be required during the 18 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.

157. **Summary of Mitigation Measures during Construction**. Table 7 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 7: 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/PMSC 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. • 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

Potential Impact	Mitigation Measures
	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/PMSC 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.3 • 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; • 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/PMSC for transportation routes and schedule. Schedule

[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 BSPCB. Mixed categories of areas may be declared as one of the above mentioned categories by BSPCB.

Potential Impact	Mitigation Measures
	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 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.

Potential Impact	Mitigation Measures
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.

158. 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

159. 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/PMSC that construction zones have been restored.

E. Anticipated Operations and Maintenance Impacts and Mitigation Measures

160. 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.

VII. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

A. ADB Disclosure Policy

161. Public consultation[4] 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.

162. 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

163. During project preparation, consultations have been held with the TN Department of Tourism and culture, tourists of Hogenekkal in Dharamapuri district 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

164. To ensure continued public participation, 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.

165. 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.

166. 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 Dhramapuri district. These copies will be made available free of 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 Dhramapuri District, and accessible to citizens as a means to disclose the document and at the same time creating wider public awareness. On

[4] 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

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.

167. 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.

VIII. GRIEVANCE REDRESS MECHANISM

168. 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.

169. 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.

170. The PIUs will convene Grievance Redress Committees (GRC) 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.

171. 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.

172. 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.

173. 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).

174. 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.

175. 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

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

177. 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.

178. 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

179. 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.

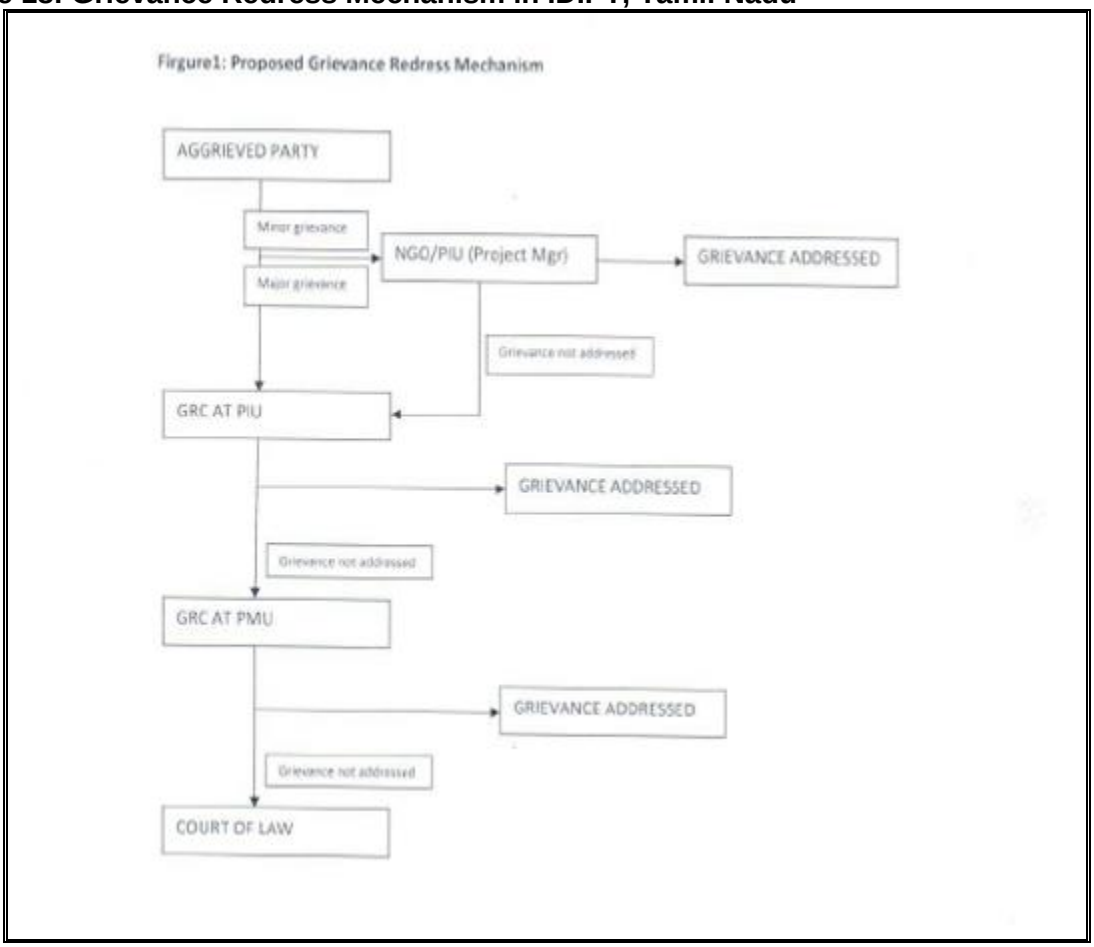
(ii) **Telecom based:** A toll free no. Will be issued by the PMU/ PIU so that general public can register their complaint through telephone / mobile phone to the PIU/PMU office.

C. Accountability Mechanism

180. 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.[5]

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

Figure 18: 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), PMSC (EE, CDE)

IX. ENVIRONMENTAL MANAGEMENT PLAN

181. 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).

182. 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.

183. 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

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

(i) Department of Tourism & Culture, Government of Tamil Nadu is the executing agency responsible for overall management, coordination, and execution of all activities funded under the loan;

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

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

(iv) The Project Management and Supervision Consultant (PMSC) 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 Hogenekkal/ Dhramapuri . This PIU will look into progress and coordination of day to day construction works with the assistance of PMSC; and

(vi) The contractor will be responsible for execution of all construction works. The contractor will work under the guidance of the PIU Dhramapuri and PMSC. The environmental related mitigation measures will also be implemented by the contractor.

185. The contractor's conformity with contract procedures and specifications during construction will be carefully monitored by the PIU. Safeguard Specialists are deputed in PMU, and PMSC 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 PMSC
- 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

Box 1: Terms of Reference of Safeguards Specialist – PMU

- 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 PMSC; 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 PMSC

- Review the IEE document and ensure adequacy under ADB SPS, 2009.
- Interact on a regular basis with the sector specialists of the PMSC 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, 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 PMSC

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

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

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

187. Responsibility for monitoring. During construction, PMSC's Environmental Specialist and the designated representative engineer of the PIU will monitor the contractor's environmental performance on day to day basis while PMSC 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.

188. Responsibility for Reporting. PIU in coordination with PMSC 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. PMSC 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

189. Tables 8 to 10 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 8: 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 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 PMSC PIU and Project Management 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 PIU and PMSC	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.	Erosion control and re-vegetation plan covering construction phase	Contractor	PMU, PIU and PMSC	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
	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. 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.	List and maps showing utilities to be shifted Contingency plan for services disruption	- PMSC to prepare preliminary list and maps of utilities to be shifted	PMU and PMSC PIU and PMSC	to be included in updated IEE report	PMSC – 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
	Require contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services. Obtain from the PIU and/or PMSC the list of affected utilities and operators; If relocations are necessary, contractor will coordinate with the providers to relocate the utility.		- During detailed design phase, contractor to (i) prepare list and operators of 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	Chance find protocol	- PMSC to consult ASI or TN State Archaeology Department - PMSC to develop protocol for chance finds	PMU	to be included in updated IEE report	PMSC

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds to Implement Mitigation Measures
	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 PMSC and PIU.	List of pre-approved sites for construction work camps, areas for stockpile, storage and disposal Waste management plan	- PMSC to prepare list of potential sites PMSC to inspect sites proposed by contractor if not included in pre-approved sites	PMU PIU	to be included in updated IEE report	Contractor
Sources of	Use quarry sites and sources	Permits issued to	Contractor	PMU	Upon submission	Contractor

Parameters	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds to Implement Mitigation Measures
construction materials	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 PMSC on a monthly basis documentation of sources of materials.	quarries/sources of materials	PMSC and PMSC to verify sources (including permits) if additional is requested by contractor	PIU	by contractor	
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	Traffic management plan	Contractor	PIU and PMSC	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
	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.					
Occupational health and safety	Comply with IFC EHS Guidelines on Occupational Health and Safety 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	Health and safety (H&S) plan	Contractor	PMU and PMSC PIU and PMSC	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
	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 PMSC PIU and PMSC Temple administrators Contractor	PMU and PMSC	- 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 9: 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	Erosion control and re-vegetation plan	Contractor	PIU and PMSC	- daily visual inspection by contractor	Contractor

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	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.			PIU to submit EMP monitoring report to PMU	supervisor and/or environment specialist - weekly visual inspection by PMSC (more frequent during monsoon season and if corrective action is required) - random inspection by PMU, PIU, PMSC and/or PMSC	
Impacts on water quality	• Schedule construction activities during non-monsoon season, to the maximum extent possible.	Work schedule	Contractor	PIU and PMSC PIU to submit EMP monitoring report to PMU	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by PMSC (more frequent	
	• Ensure drainages and water bodies within the construction zones are kept free of obstructions.	Visual inspection				
	• Keep loose soil material and stockpiles out of drains and flow-lines.	Visual inspection				
	• Avoid stockpiling of excavated and construction materials (sand,	Visual inspection				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	gravel, cement, etc.) unless covered by tarpaulins or plastic sheets.				during monsoon season and if corrective action is required) - random inspection by PMU, PIU, PMSC and/or PMSC	
	• Re-use/utilize, to maximum extent possible, excavated materials.	condition in waste management plan				
	• Dispose any residuals at identified disposal site (PIU/PMSC 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				
Impacts on air quality	• Conduct regular water spraying on stockpiles.	- Visual inspection - No complaints from sensitive receptors - Records	Contractor	PIU and PMSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual	Contractor
	• Conduct regular visual inspection in the construction	Visual inspection				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	zones to ensure no excessive dust emissions.				inspection by PMSC (more frequent during dry season and if corrective action is required) - random inspection by PMU, PIU, PMSC and/or PMSC	
	• Maintain construction vehicles and obtain "pollution under control" certificate from BSPCB.	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/PMSC 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 PMSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by PMSC (more frequent during noise-generating activities and if corrective action is required) - random inspection by PMU, PIU,	Contractors
	• Minimize noise from construction equipment by using vehicle silencers and fitting jackhammers with noise-reducing mufflers.	Report on ambient noise level monitoring within direct impact zones				
	• 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	- Complaints addressed				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	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.	satisfactory - Grievance Redress Mechanicm (GRM) records			PMSC and/or PMSC	
Impacts on flora and fauna	• Conduct site induction and environmental awareness.	Records	Contractor	PIU and PMSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by PMSC (more frequent if corrective action is required) - random inspection by PMU, PIU,	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 Warden of Tamil Nadu State Forest Department. • Provide sound barriers towards existing aviary and restrict noisy activities during day time only.	-Number and species approved by Tamil Nadu State Forest Department -Sound barriers installed towards aviary				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
					PMSC and/or PMSC	
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 PMSC for any structures within WTP site and construction zone	PIU and PMSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by PMSC (more frequent if corrective action is required) - random inspection by PMU, PIU, PMSC and/or PMSC	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/PMSC for transportation routes and schedule. Schedule transport and hauling activities during non-peak hours. Communicate road detours via visible boards, advertising, pamphlets, etc.	- 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
	• 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/PMSC 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, and other similar items). • Prohibit disposal of any material or wastes (including human waste) into drainage,	condition in waste management plan	Contractor	PIU and PMSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by PMSC (more frequent if corrective action is required) - random inspection by PMU, PIU, PMSC and/or PMSC	Contractor

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	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 PMSC	- daily inspection by contractor supervisor and/or environment specialist - weekly visual inspection by PMSC (more frequent if corrective action is required) - random inspection by PMU, PIU, PMSC and/or PMSC	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				
	• Provide clean eating areas where workers are not exposed to hazardous or noxious substances.	- Workers area				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
	• 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 PMSC	- daily inspection by contractor supervisor - weekly visual inspection by PMSC (more frequent if corrective action is required)	Contractor
	• 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.	Employment records				

Potential Impact	Mitigation Measures	Parameter/ Indicator of Compliance	Responsible for Implementation	Responsible for Supervision	Frequency of Monitoring	Source of Funds
					- random inspection by PMU, PIU, PMSC	

Table10: 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-vegetation and tree re-planting. Replace all plants determined to be in an unhealthy condition.	Pre-existing condition Construction zone has been restored	Contractor	PIU and PMSC 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
	• Request in writing from PIU/PMSC that construction zones have been restored.					

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

190. Table 11 summarizes site and activity specific plans to be prepared as per EMP tables.

Table 11: 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 PMSC/PMSC	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	PMSC 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 PMSC	Contractor
Detailed Design Phase	List of pre-approved sites	Location/s for work camps, areas for stockpile, storage and disposal	PIU and PMSC	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 safety	Contractor	Contractor

C. Environmental Monitoring Plan

191. 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.

192. Table 12 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.

193. Environmental monitoring will be done during construction in three levels; namely monitoring development of project performance indicators done by the PMSC Environmental Specialist, monitoring implementation of mitigation measures done by the Contractor; and overall regulatory monitoring of the environmental issues done by the PMSC/PMU Environmental Specialist. The monitoring carried out by the contractor through the approved agency will be supervised by the Safeguard Specialist of the Project Management and Supervision Consultant. 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 12: 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

	Attributes	Stage	Parameters to be Monitored	Location	Frequency	Responsibility
5	Noise Levels	Construction and Operation Stage	Equivalent Day and Night Time Noise Levels	All Construction sites	Once in a season during construction stage	Contractor, to 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

194. The Environmental Specialist of the PMSC 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 Tables 13 and 14below. This training program is intended for the entire destination and is not just specific to this package.

Table 13: 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	• Tourism/Forest/Roads/Culture Department Officials, Project Director and Environmental	• Workshop	• ½ Working Day	• Environmental Specialist of the PMSC and PMU

Program	Description	Participants	Form of Training	Duration/ Location	Training Conducting Agency
	environment • Environmental Regulations and Statutory requirements as per Govt. of India and ADB	Specialist of the PMU/PIU			
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 PMSC and PMU
• 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 PMSC and PMSC

Table 14: Training 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 PMSC	Lectures cum interaction & Workshop	½ Working Day	Environmental Specialist of the PMSC
Session I					
Module I	Introduction to Environment: Basic 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.	PMU/PIU (including the ES), PMSC and Engineering staff of the implementing Agencies	Lecture	1 Working Day	Safeguards Specialist of the PMSC

Programme	Description	Participants	Form of Training	Duration/ Location	Training Conducting Agency
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/PMSC (including the ES) and Engineering staff of Tourism Dept.	Workshop	¼ Working Day	Safeguards Specialist of the PMSC.
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 PMSC with support from the conservation specialist of the PMSC.
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 PMSC	Lecture / Interactive sessions	1 Working Day	Safeguards Specialist of the PMSC.
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					
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 PMSC
Session III					
Module VI	Identification of birds species in	Staff of Forest	Site visits,	5-7 working	Institutes as

Programme	Description	Participants	Form of Training	Duration/ Location	Training Conducting Agency
	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.	Department, Youth in the villages, periphery of the Wetland, and other NGOs in the District.	Interactive sessions	days	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/ PMSC/NGOs and community representatives	Lectures, Workshop and site visits	4 – 5 Working Days	Safeguards Specialist of the PMSC – During initial stage of Construction

E. Environmental Management Plan Implementation Cost

195. 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.

196. 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.

197. 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 15 below.

Table15: 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	

X. FINDINGS AND RECOMMENDATIONS

198. The proposed components as part of the package are in line with the sub-project 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 (i) Improvement at Tourist Guest House and Information Centre at Hogenakkal in Dharmapuri District in Tamil Nadu; (ii) Construction of Banquet Hall & Tourist Hostel in District Town of Trichy, and (iii) Renovation of Heritage Tourist Centre in Kanyakumari. 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 Organisation (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.

199. 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 proposed facilities will enhance the environmental conditions and minimize the pollution related aesthetic quality near the Tourist Guest House and Information Centre at Hogenakkal in Dharmapuri District, near Banquet Hall & Tourist Hostel in District Town of Trichy and Renovation of Heritage Tourist Centre in Kanyakumari

200. The specific management measures laid down in the IEE will effectively address any adverse environmental impacts due to the sub-project. 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 PMSC Consultants. Further, the environmental monitoring plans provide adequate opportunity towards course correction to address any residual impacts during construction or operation stages.

XI. CONCLUSIONS

201. The IEE carried out for the subproject shows that the proposed Improvement at Tourist Guest House and Information Centre at Hogenakkal District, Construction of Banquet Hall & Tourist Hostel in District Town of Trichy and Renovation of Heritage Tourist Centre in Kanyakumari will result in increasing tourist arrival to Hogenekkal in DharmapuriDistrict, 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.

202. 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).

PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

Details of the Site: The site is free from encumbrances and is freely available with Tamilnadu Tourism and Development Corporation (TTDC) 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 various stake holders. The details of the site visit are given below:

Date of Visit: 01.06.2017

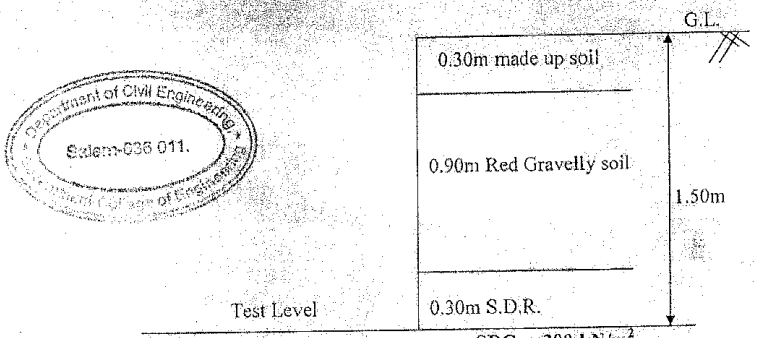
Name of the work: Improvement at Tourist Guest House and Information Centre at Hogenakkal in Dharmapuri District.

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

Description of the Site: This property is belonging to Tamil Nadu Tourism Development Corporation. The existing hotel facilities in the hotel for the tourists may not cater the requirements. The works for construction is part of the improvement. Hence, improvements & up gradation to the hotel complex is considered as per the proposal and recommendation of local authorities & from the line department.

Soil sample collection: Soil samples have been collected 1 location at site.

The test pit for a depth of 1.50m was available for mapping soil stratification at the site. The top layer consists of made up soil for a depth of 0.30m. Below the top layer, red gravelly soil was present for a depth of 0.90m and Soft Disintegrated Rock (S.D.R.) was present in the remaining depth of 0.30m in the test pit.



Test Pit - Stratification

The standard penetration test was conducted at a depth of 2.00m below ground level and there was a refusal to penetration. Based upon the field investigation, laboratory tests and also by considering the water table effect at the test level, it is recommended that the safe bearing capacity of the soil may be taken as **300 kN/m²**.

PROFESSOR OF CIVIL ENGINEERING
Dr. G. VIMALA ROSALINE, M.E.,Ph.D.
Professor & Head
Dept. of Civil Engineering
Govt. College of Engineering

Note: The detail furnished is based on the representative pit. If any changes in the soil strata is observed during excavation for foundation, you are requested to ascertain the SBC value.

VC A ASOKUMAR, M.E.
Assistant Professor in Civil Engineering
Government College of Engineering
Salem - 636 011

Dr.V RAJKUMAR M.E (Structures),Ph.D.,
Associate Professor in Civil Engineering
Government College of Engineering
SALEM - 636 011.

PROJECT ENGINEER
Tamilnadu Tourism
Development Corporation Limited
Chennai - 2.

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:

(i) the concerned official of Temple Management Authorities;
(ii) discussion with the local people; and
(iii) Elected council/ward members.

The outcome of the Public Consultation was 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.

(i) The participants concurred with the selection of components for the infrastructure development;
(ii) 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;
(iii) 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;
(iv) The local community members specially self help groups could be given the entrepreneur training to provide assistance to the Tourists;
(v) 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;
(vi) Drinking water facility with treatment and adequate toilet facilities to be given priority;
(vii) While laying road the present component of cement road could be replaced by the latest technology of paver blocks; and
(viii) Waste collection, segregation and final disposal need to be planned and implemented.

Figure 1: Pictures Taken during Site Visit






Participants of Public consultation

ATTENDANCE OF THE PARTICIPANTS FOR THE PUBLIC CONSULTATION HELD ON 01st August JUNE 2017
FOR THE TOURISM INFRASTRUCTURE DEVELOPMENT AT: Hogenakkal Tamil Nadu Hotel

Sr. No.	Name	Occupation	Contact Details	Signature
1	Anil Panda	ESHS Consultant Mukesh Associates	9861048089	
2	P. Uthayakumar	Manager Hotel Tamilnadu Hogenakkal	9176995836	
3	K. Kiran Kumar	Field Engr. Mukesh Associates	9677677[illegible]7	
4	S. RAVI	Assistant Engineer, Krishnagiri	9443082541	
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Note: Proposal has been in Place for AVIP suites Approach Road with Paver blocks. Parking slot to be added.

PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

Details of the Site: The site is free from encumbrances and is freely available with Tamilnadu Tourism and Development Corporation (TTDC) 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 various stake holders. The details of the site visit are given below:

Date of Visit: 06.06.2017

Name of the work: Construction of Banquet Hall & Tourist Hostel in District Town of Trichy" at Tiruchirapalli.

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

Description of the Site: This property is belonging to Tamil Nadu Tourism Development Corporation. The existing facilities for the tourists may not cater to the requirements. The works for construction is part of the improvement. Hence, Construction of Banquet Hall & Tourist Hostel in District Town of Trichy is considered as per the proposal and recommendation of local authorities & from the line department. This involves Construction of an additional building (G+3) adjacent to the existing hotel building with a connecting corridor. Ground floor comprising of a Banquet Hall, Lobby, Waiting area, Store room, pantry, Electrical room, Bride's room, Bridegroom's room, Staircase, Fire Shaft & Elevator. First and Second Floor consisting of five standard Double rooms each with Walk-in Wardrobes, Lobby and Waiting area. Third Floor consisting of Lobby & Waiting area, 2 standard Double rooms, 2 Suite rooms each with Walk-in Wardrobes and a Store room. Provision for Car Parking of 15 numbers capacity and provision of Paver Blocks. Refer photographs in Figure 8 below.

Soil sample collection: Soil samples have been collected at different depths in 2 locations at site. Red soil occurs in the strata below 1m upto 3 to 4m. From thereon, weathered rocks exist.

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:

(i) the concerned official of TTDC Hotel and supervising Engineers; and
(ii) discussion with the local people.

The outcome of the Public Consultation was 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.

(i) The participants concurred with the selection of components for the infrastructure development for TTDC, Trichy;

(ii) 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;

(iii) 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;

(iv) The local community members specially self help groups could be given the entrepreneur training to provide assistance to the Tourists;

(v) 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;

(vi) Drinking water facility with treatment and adequate toilet facilities to be given priority;

(vii) While laying road the present component of cement road could be replaced by the latest technology of paver blocks; and

(viii) Waste collection, segregation and final disposal need to be planned and implemented.

Figure 1: Pictures Taken during Site Visit


06 06 2017

Participants of Public consultation

ATTENDANCE OF THE PARTICIPANTS FOR THE PUBLIC CONSULTATION HELD ON 8th JUNE 2017
FOR THE TOURISM INFRASTRUCTURE DEVELOPMENT AT: Tamilnadu Hotel, Trichy

Sr. No.	Name	Occupation	Contact Details	Signature
1	Atul Panda	Consultants, Mukesh & Associates	9861045089	
2	R. Loganthan.	Mukesh & Associates	8973606576	
3	N. Imthiyas	MA A	9500294626	
4	R. SABARI	Technical Asst.	8508520153	
5	S. Prabhu	F & B Services	9159785056	
6	D. MANIMARAN	Retired	9790869300	
7	G. Kanthi	T.S	8124170569	
8	P. Sivalingam		8940823847	
9	M. Rajendran	Farmer	9788168898	
10	S. Rajadurai	Farmer	9524970977	
11	N. Sekaran	Staff	7867941457	
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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. Further, there is no necessity of any utility shifting and cutting of trees. The site visit by the DSC team was conducted to organize a public consultation with a view to appraise. The progress made in IDIPT project implementation by the line department TTDC and to elicit the public opinion/issues/problems faced during the construction stage-(Environmental Impacts, Constraints, benefits, tree felling, and enhancement measures). After the dialogue with the respective community the summary is presented to the line department for necessary action.

The details of the site visit are given below:

Date of Visit: 29.07.2017

Name of the work: Renovation of Heritage Tourist Centre in Kanyakumari.

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

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:

(i) the concerned official of Temple Management Authorities;
(ii) discussion with the local people; and
(iii) Elected council/ward members.

The outcome of the Public Consultation was 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.

(i) The participants concurred with the selection of components for the infrastructure development;
(ii) 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;
(iii) 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;
(iv) The local community members especially self help groups could be given the entrepreneur training to provide assistance to the Tourists;
(v) 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;
(vi) Drinking water facility with treatment and adequate toilet facilities to be given priority;
(vii) While laying road the present component of cement road could be replaced by the latest technology of paver blocks; and

(viii) Waste collection, segregation and final disposal need to be planned and implemented.

Description of the Site: The location considered for the subproject are within the areas designated for tourism support infrastructure development as part of developing Tamilnadu's conservation, heritage, natural and cultural attractions, and is outside areas demarcated for habitat protection and conservation. The proposed infrastructures 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, Govt & local bodies are very much keen into taking up these proposed works. The entire town and adjoining areas are under municipality control who has proposed this project. The property boundaries are clearly marked. This property is in the possession of Tamil Nadu Tourism Development Corporation (TTDC)., Government of Tamilnadu. Hence, there is no requirement for any land to be acquired

The site of 10.76 acres is located across the beach (opposite the view tower). The property overlooks the sea and has a view of the 3 seas meeting i.e. the Indian Ocean, Arabian Sea and the Bay of Bengal (Bay of Bengal is visible at a distance). The property is merely 300 m away from the tip of the Indian mainland.

Soil sample collection: Soil samples have not been collected considering that no new structure is being constructed in this site. Only repair / rehabilitation works are envisaged for this site.

Figure 1: Pictures Taken during Site Visit

Figure 2: Pictures Taken during Site Visit

Figure 3: Pictures Taken during Site Visit

Participants of Public Consultation

ATTENDANCE OF THE PARTICIPANTS FOR THE PUBLIC CONSULTATION HELD ON 29th July ~~JUNE~~ 2017
FOR THE TOURISM INFRASTRUCTURE DEVELOPMENT AT: Tamilnadu Hotel, Kanyakumari

Sr. No.	Name	Occupation	Contact Details	Signature
1	Anil Panda	ESHS Consultant Mukesh Associates	9861048089	[signature]
2	K.Kirankumar	Filed Engineer, Mukesh Associates	9677671317	[signature]
3	ER.V.Paul Jeba Gnanadhas	AEE. Kanniyakumari	9176995828	[signature]
4	C.R.JACKSON WILLIAMS	Manager TTDC Kaniyakumari	9176995850	[signature]
5	T. Sivan	Bill clerk	9043958419	[signature]
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Note: 60 year old building. Roof is leaking, New flooring needed with vitrified Tiles. Walls need new Plastering. Sewerage System is alright. New stones needed, Kitchen need Renovation with stainless steel racking. The Restaurant need new Tiles. Approach Road need Paver Blocks.

CONTRACT CLAUSES TO BE INTEGRATED INTO BID DOCUMENTS

A. Improvement at Tourist Guest House & Information Centre at Hogenakkal in Dharmapuri District 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 lanPMSCape.

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 PMSC, PMSC or with the PIU and communicated to the Contractor, which is not properly addressed within the time period intimated by the PMSC / PMSC, 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, PMSC 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 PMSC 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:
   (a) Pension or family pension on retirement or death as the case may be.
   (b) Deposit linked insurance on the death in harness of the worker.
   (c) 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.)

RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST

URBAN DEVELOPMENT

Instructions:
8. (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: INDIA/ "**Improvement at Tourist Guest House & Information Centre at Hogenakkal in Dharmapuri District** "
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 sub-project 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

SCREENING QUESTIONS	Yes	No	REMARKS
			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,	√		An emergency handling

SCREENING QUESTIONS	Yes	No	REMARKS
acidic and alkaline materials?			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 asafe manner meeting the CPCB guidelines.

RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST

URBAN DEVELOPMENT

Instructions:
9. (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: INDIA/ **Construction & Improvement Works of TTDC Hotel at Trichy, Tiruchirappalli 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 sub-project 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

SCREENING QUESTIONS	Yes	No	REMARKS
			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,	√		An emergency handling

SCREENING QUESTIONS	Yes	No	REMARKS
acidic and alkaline materials?			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 asafe manner meeting the CPCB guidelines.

RAPID ENVIRONMENTAL ASSESSMENT (REA) CHECKLIST

URBAN DEVELOPMENT

Instructions:
10. (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: "Renovation of Heritage Tourist Centre in Kanyakumari 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 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		√	Waste generated from demolition of the present

SCREENING QUESTIONS	Yes	No	REMARKS
area?			structure will be disposed off in low lying areas and approved municipality dump yard. Liquid and solid waste generated at the Heritage Tourist Centre 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 Tamil Nadu Government 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		√	Not applicable to this site.

SCREENING QUESTIONS	Yes	No	REMARKS
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.

ENVIRONMENTAL MONITORING FORMAT

A. Work Details

Table 1. Work Details and Risks

Locations	Sub-projects Components (Package No.)	Name of the contract	Listing of works under the package	Starting Date (land clearance) and schedule date of completion	What type of works continued at present	Progress Percentage	Expected changes from approved scope	Fulfilment of objectives- Type of remedial measure needed	Key assumptions and risks that affect attainment of the objective

B. Implementation of Environmental Management Plan

Table 2. Status of Environment, Forest and Other Clearances

City / Town	Work (Package No.)	Applicable Legislation / Type of Clearance	Clearance given by and date	Subject / Issue	Remarks / Action needed

Table 3: Compliance with Environmental Management Plan

Description of Impact	Mitigation Measures Proposed	Implantation Status	Detail/Remarks on Implementation	Monitoring methods and frequency	Monitoring conducted by	Monitoring Remarks (Excellent/Satisfactory/Partially Satisfactory/Below Satisfaction/Poor/ Very Poor)	Remarks and actions taken to improve implementation
Detailed Design							
Pre-construction							
Construction							

Table 4: Measurement of Pollutants

Components	Package/ Location	Period of monitoring	Parameters /Pollutants	Standard	Base line status	Monitoring Result during Project Implementation	Remarks
Noise							
Air Quality							
Water Quality							
Soil Quality							

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:			