TERMS OF REFERENCE (TOR) FOR RAPID EIA/SIA OF THE 656 KM LONG PROPOSED COASTAL HIGHWAY ALIGNMENT IN KERALA

1. Introduction

Kerala is abundant with a long coastal line. The Kerala coastline passes through the nine districts such as Thiruvananthapuram, Kollam, Alappuzha, Ernakulam, Thrissur, Malappuram, Kozhikode, Kannur and Kasaragod. The connectivity in coastal area is very important in improving the trade and commerce related to the coastal regions. In Kerala, the present scenario is such that the connectivity along the coastal side is meagre. Improving the connectivity along the coastal side was the main objective behind the idea of developing a highway along the coastline and as a result a Coastal Highway with a length of 656 km has been declared in the state. The Coastal Highway is expected to boost the industries like fishing, sea food import and processing units, fishing harbours, ports, tourism etc. The highway can also act as an alternative route of National Highway (NH 66).

NATPAC has done preliminary alignment surveys and has proposed an alignment for the Coastal Highway. The alignment traverses majorly through existing roads and proposes construction of new bridges and flyovers and missing links. In order to finalise the alignment, a rapid EIA and SIA are required to be done according to the TOR which is as follows.

2. Objectives

Objective of the EIA study is to understand and analyse the Environmental and Social Impacts associated with the proposed Coastal Highway alignment through the existing roads in the coastal region of Kerala. The Rapid EIA and SIA process should be done separately for both sides of the alignment and for each links which are given in **Annexure 1**.

3. Scope of the Work

- Review of the alignment proposed for the development of coastal highway

- Baseline data collection on physical environment including ambient air quality, land environment, water environment, ambient noise, bio-environment including Flora and Fauna.
- Identification of significant environmental issues and decision making information for the proposed works, including analyzing the various alternatives.
- Identification of the number of affected people in the Project Influence Area (PIA) and number of structures affected
- Incorporation of Coastal Regulation Zone Guidelines as the study area falls in the coastal region
- Review and delineate the statutory clearance requirement under Environmental Protection Act, 1986 applicable to the project
- Execute a Rapid Environmental Impact Assessment study (EIA) towards an effective Environmental Management Plan (EMP) as per the procedure laid down by MoEF & CC.
- Preparation and submission of documents to various regulatory authorities, assisting the Client towards obtaining statutory clearances through technical presentations, clarifications if any.

4. Approach and Methodology

The above scope should be executed through a series of tasks as defined below.

2.1. Collection and Review of Project Activities and Review of Regulatory Requirements

EIA & SIA requires a clear detailing of the proposed project i.e., project location, activities proposed, special extent and nature of activities, resource requirement related with the same etc. Hence the study is to be initiated with collection of all project related documents already prepared by the Client; this includes the detailed information on the project components, alignment and its geometry proposed, feasibility studies already undertaken including the futuristic development pattern envisaged due to the project along the region which can influence the ambient environmental setting of the region during the operational phase of the project.

2.2. Review of Environmental Regulations Applicable for the Project

On due review of the proposed alignment and project components in detail, a detailed review needs to be carried out towards delineating the environmental regulations applicable for the project. The environmental regulations enacted time to time under the umbrella act, Environmental Protection Act, 1986 is to be reviewed to understand the applicability of various statutory clearances for the proposed development and the study be executed so as to comply with the mandatory requirements to be followed.

2.3. Execution of EIA Study

The study need to analyze the proposed development w.r.t. its potential to attract environmental and socio-economic impact on the Project Influence Zone (PIZ). The direct and indirect impacts on the various environmental components affected by the project need to be reviewed to identify the Valued Environmental Components (VECs) also termed as Valued Ecosystem Components and further identify the mitigation measures towards integration in to project design.

2.4. Reconnaissance Visit and Collection and Review of Literature

With the project components availed in detail, a reconnaissance visit along the project area and its immediate influencing areas need to be executed towards a preliminary understanding of the environmental profile of region. This is to be continued with the collection and review of literature from various published resources towards assessing the critical environmental features associated with the project.

2.5. Delineating the study area

As per the guideline, the study area for the proposed EIA Study falls for an aerial distance of 15km along the project region. While the essential primary data need to be collected for the 500m from the centreline of proposed highway, the secondary data needs to be collected for the wider stretch of 15km around the project area. This is to essentially understand the induced impacts if any in the project region, due to

the project intervention. The study area is to be primarily delineated in a satellite imagery of medium resolution w. r. t. land, water bodies, settlements and other cultural features. This is to be followed by a detailed site visit for preparation of an environmental inventory.

2.6. Secondary data Collection

Because of the time constraints related to the Rapid EIA, the recent secondary data from reliable sources can be considered as the baseline data and can be used for the Rapid EIA study.

2.7. Establishing Baseline Environmental Profile of the Project Area

The impacts of the proposed highway development components fall into three phases of project including

- Pre-construction phase
- Construction phase
- Operation phase

In order to understand the changes induced by a project and to ensure that the proposed development does not exceed the environmental standard set forth, it is essential that the baseline environmental profile of the project region is established in detail. This will essentially lead to analyse of the impacts due to the project interventions towards deriving the most appropriate mitigation measures and will act as a benchmark to ensure environmental safeguard during the course of the implementation and operation of the proposed project.

Baseline environmental profile of project region need to be established through the various environmental attributes such as land, water, soil, biological, and Noise and Socio Economic (SE) environment and the essential data required for establishing the baseline profile is as follows:

2.7.1. Land Environment

Land use pattern of the project location and its neighbouring areas shall be established through a land use map of the project area in high resolution satellite imagery /any other available maps covering an aerial distance of 15km from the project boundary. The various attributes such as forest, agriculture land, water bodies, settlements, archaeological features, sensitive receptors, cultural features etc. are to be marked in the map. The baseline profile of the project area in terms of geology and topography has to be also established through district planning map, gazetteers, maps prepared by Geological survey of India and various other maps available of the project corridor.

Notified industrial areas habitation, beaches, fishing harbours and related industries, nature of the terrain (plain, rolling, hilly), environmentally sensitive places, mangroves, river, lake etc. are also to be considered in the study. The CRZ zones of the entire project area haves to be identified. The CRZ rules and NCESS rules which is valid for the road sections should be identified. The project land which is identified with serious high tide effects and vulnerable sea attacks has to be duly considered and attended.

2.7.2. Ambient Air Quality

Ambient Air Quality (AAQ) has to be monitored by choosing locations to represent AAQ status of the project area as per CPCB guidelines so as to represent residential, commercial and other sensitive locations along the alignment and to compare the conformance with NAAQ standards. The parameters which should essentially form part of the monitoring include CO, PM10, PM2.5, SO2 and NOX. Comparing with the environmental inventory made during the site visit indicating pollution sources, if any, that could have an impact on the AAQ of the project region. It is also required to study the improvement in AAQ that will be expected due to the diverted traffic in other roads. In addition to this, Climate and meteorology details such as maximum and minimum temperature, relative humidity, rainfall, frequency of tropical cyclone and snow fall should be collected. The nearest IMD meteorological station from which climatological data have been obtained has to be indicated. Wind rose including Wind direction and speed for 24 hour data need to be collected.

2.7.3. Water quality

Water quality and the impacts of the project in the ground water level, surface water and the flow of surface water have to be taken care of. The study should be done considering the infrastructure that has been proposed in the area.

2.7.4. Noise Environment

Baseline data of the ambient Noise level of the project area shall be established through ambient noise monitoring network at various locations along the project region considering the various land use pattern of the project region in line with the Noise Pollution (Control and Regulation) Rules, 2000

2.7.5. Biological Environment

The secondary data on the existing flora and fauna in the study area, marshy lands including paddy/wetland areas, salinity intruding areas are to be collected and compiled. Both terrestrial and aquatic components along the project corridor are to be recorded based on secondary data as well as sampling and analysis of primary data. In case of rivers or any other water bodies, the biological investigation is to be compiled through scientific monitoring and analysis of the flora and fauna along the region. Since there are areas where the salinity is migrating and mangroves are present, associated flora and fauna has to be recorded as part of the EIA Study. Appropriate mitigation measures or conservation measures has to be integrated into the project design as part of the EIA Study. Since the coastal highway passes mostly in the proximity to sea, the impact of proposed project site in any breeding or nesting ground of birds and other aquatic species especially the amphibians have to be studied. Details about the name of the aquatic organism, type of habitat and period of year in which activity takes place should be provided,

2.7.6. Socio - Economic Environment

SE environment can be established through census data and related official records for critical attributes such as population, employment and health status etc. The study should also include Public Hearing (PH) along the project region to understand the perceptions of the public about the project and the extent of the social impact in

the project region. Where the land acquisition is required, it is essential to get an overall response of the public for Land Acquisition and Rehabilitation.

Since the project deals with improving the transport network along the coastal region, the benefits the project is expected to create boost in the marine industries and trading area and tourism sector and this has to be taken into account.

2.8. Analysis of Alternatives & EIA Study

It is essential that the various alternative alignments proposed for Coastal Highway has to be understood. Details on the merits and demerits on the environmental and SE profile are to be supplemented. In due consideration of the various alternatives studied, the best alternative which will have least environmental, economic and social impact has to be identified or suggested as part of the study.

EIA has to be executed through matrix method where environmental attributes and impacts on the environmental attributes are to be cross analysed. Activities proposed during the pre-construction, construction and operation phase has to be listed against the impact probability and for each stage the environmental impacts on the various environmental attributes has to be marked as minimum, medium or high and for which the environmental management plan (EMP) will specify the mitigation measures such as avoid, minimize, or mitigate.

2.9. Preparation of EMP & Environmental Monitoring Plan

For the most suitable option, environment impact on various environmental attributes as discussed above due to the proposed activities should be assessed in detail further to derive an effective EMP including Environmental Monitoring plan. Block cost estimate for implementing EMP has to be worked out.

2.10. Supporting Client in various stages

The Consultant should support the client in various stages of discussions and presentations related to the EIA. Consultant will extend their services with providing technical clarification on the various aspects associated with the project and support the Client towards according clearances if required.

5. Timeline

The study needs to be concluded in a period of 2 months from the date of work order.

6. Team Composition

Consultant shall extend the services of QCI-NABET Accredited EIA professionals with necessary supporting staff to enable quality and timely delivery in due compliance with the MoEF &CC directions.