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Assessment of Potential Impacts on NH7 – 4 Laning from Salem to KARUR

T. SUBRAMANI[1]
[1]Professor & Dean, Department of Civil Engineering, VMKV Engg College, Vinayaka Missions University, Salem, India.

ABSTRACT

For the developing countries like India, it is highly essential to concentrate on the various developmental activities which are yard sticks for the degree of heights of development in term of technology and economy. To increase our pase of achievements in various field developmental activities are planned and implemented in various fields. Any developmental activity needs prior assessment of environmental impacts before its approval to start the work. The main objective of this thesis work is to assess the potential impacts which have taken place during the 4 laning of NH7 highway from Salem to Karur. In this project area, three districts namely Salem, Namakkal and Karur are covered. Many number of small panchayats, towns are in these three districts in the National Highways. The prime aim of this work is to collect the base line environmental details of land resources, water resources, air quality, noise levels, forests and protected areas, roadside plantations, cultural and community environments, social environment etc. from the respective collectorates. This collection is done for the period prior to 2005, before the commencement of the 4 laning work. The data and figures of the various resources are tabulated and shown in figures. It could be taken as a base data prior to the study of the environmental impacts in the study area of this project. These data differed from place to place. The assessment of the impacts were made during the construction of the highways and afterwards from 2005 onwards. The potential impacts both positive and negative such as climatic condition, land resources, water resources, air quality, flora, community facilities, cultural properties and social environment were collected and analyzed. It could be seen that the impacts when compared with the base data, have created not much significant adverse impacts. However, the temporary impacts may occur and hence suitable mitigation measures should be made with periodical community consultation. It could be observed that there are reduced accidents, improved accessibility and connectivity, reduced vehicle operator and maintenance cost, facilities to road works, improved quality of life and faster travel could be carried out. To reduce the air impacts and noise impacts in future, more plantation of trees on road side and development of green belts could be carried out.

KEYWORDS: Assessment, Potential Impacts, NH7, 4 Lane, Salem To Karur

1. INTRODUCTION - GENERAL

It is common Knowledge that humans continue to have a high impact on the environment. The combination of an exponentially growing population, escalating use of the earth's resources and human desire to modify rather than adopt to our surroundings, may seriously challenge the assimilative capacity of our natural system. Upto one half of the Earth's territorial environment has already been altered from its natural state through human activity. Over the passage of time, two conflicting facts have become clear that we continue to degrade the environment that we rely on and that we disrupt the functioning of its processes for both our economic and physical survival.

2. ENVIRONMENTAL IMPACT ASSESSMENT

It is a formed process used to Predict the environmental consequence of any developments Project. It is intended by identify the environmental, social and economic impacts of a proposed development period by decision making using EIA it in Principle by assite the Suitable environments option and alterative Process at an early stage.

3. PROJECT DESCRIPTION – PROJECT BACKGROUND

The Govt. of India (GoI) through Ministry of Roads & Highways (MORT&H) has decided to enhance the traffic capacity and safety for efficient transhipment of goods as well as passenger traffic on National Highway sections with heavy vehicular traffic. It has undertaken a massive National Highway Development Program (NHDP) consisting of widening and strengthening of NH sections connecting four major metros of Delhi, Mumbai, Chennai & Kolkata, popularly known as "Golden Quadrilateral" amounting to a total length of 5846km and improvements to North-South corridors connecting Kashmir with Kanyakumari and East-West corridors connecting Silchar with Porbandar amounting to a total length of 7300km.

The project under consideration aims at developing Salem-Karur section of NH-7, located in Tamilnadu state is a part of NHDP connecting North-South corridors

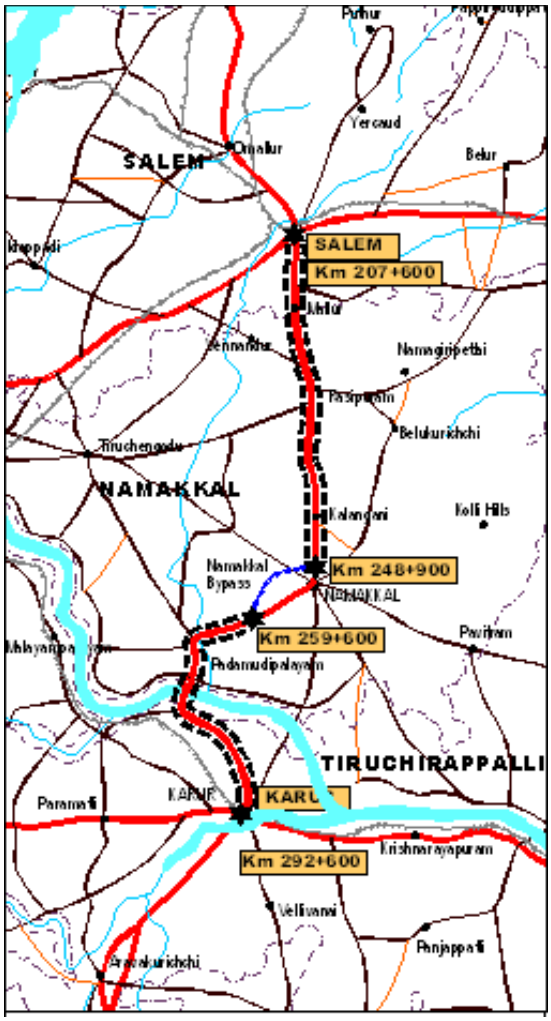

FIGURE.1 MAP OF THE PROJECT CORRIDOR

4. PROJECT CORRIDOR

The section of NH-7 under consideration takes off from a rotary intersection in the urban area of Salem. Existing four lane Salem bypass also starts at the same intersection. Chainage of the project corridor at this starting point is km 207+600, km 0+000 being at Bangalore. The project corridor travels south with an increase in the chainage towards Namakkal and Karur.

Namakkal bypass takes off from the NH-7 at km 248+900 on the outskirts of the city, and ends at chainage km 259+600. The project corridor ends at the outskirts of Karur town, where a four-lane bypass for the town is already in existence. Chainage of this intersection is km 292+600. The ToR mentions as the end point chainage to be km 301+000. However, a four-lane bypass already exists between km 292+600 and km 301. Accordingly, the end point for the present section may be considered as km 292+600 only.

The project corridor has a two lane, 6.5-7m wide carriageway with varying width of shoulders from 1-1.5m on either side. Shoulder type varies along the corridor as some intermittent sections have paved shoulders. The project corridor generally traverses through plain terrain for most of its length except for few locations where terrain conditions are little undulating. Exposed rock has been observed at several places along the corridor. The project corridor generally has embankment height varying from 0.5-2m except at major bridge approach of Cauvery River at km 278, where an embankment height of 8-10m exists on both sides. Most of the water bodies along the project corridor are in dry state with no water. River Cauvery has a very wide course of 800m across the corridor but has narrow and shallow watercourse within.

Most of the Horizontal curves along the existing alignment fulfill the requirements of IRC standards for a design speed of 100 kmph. There are few sharp curves where it is required to improve the radius to ease out the curvature effect. Vertical geometry, in general, appears to be very smooth with flat gradients and long curves all along with few exceptions at places of rolling terrain conditions where corridor crosses small mounds. The available sight distance in both horizontal and vertical curves appears to be adequate and can still be increased with removal of bushes adjacent to the road. Combination of horizontal and vertical geometry has good pleasing aesthetics and do not have any disjointed effects along the entire corridor.

Agriculture is the predominant land use along the corridor. Several educational institutions, textile industries, hatcheries, poultry farms have also been observed along the corridor. The project corridor apart from having bypass at Namakkal also bypasses major settlements of Paramatty and Pugaloor/Veleyudampalayam.

There are as many as 146 intersections with various categories of roads along the corridor. Amongst them, nearly 16 intersections are of primary importance with SH, MDR and at existing bypass locations with old NH. In addition, there are 5 intersections of secondary importance with ODR and village roads, where good amount of motorized traffic are observed.

4. SCOPE OF WORKS

The objective of the study includes the following:

- The main objective is to establish the technical, economical, and financial viability of the project and prepare detailed project reports for rehabilitation and upgrading of the existing 2-lane National Highway (NH) sections to 4-lane divided carriageway configuration.
- The viability of the project designed as a partially access controlled facility need to be established taking into account the requirements with regard to rehabilitation, upgrading and improvement based on highway design, pavement design, provision of service roads wherever necessary, type of

intersections, underpasses / flyovers / ROB's, rehabilitation and widening of existing and/ or construction of new bridges and structures, road safety features, quantities of various items of works and cost estimates vis-à-vis the investment and financial return through toll and other revenues.

- The Detailed Project Report would inter-alia include detailed design, social and environmental action plans as appropriate and documents required for tendering the project on commercial basis for international / local competitive bidding.
- Provision of bypasses, realignments, and grade separators shall be considered where practicable and cost effective.

5. ASSESSMENT OF IMPACTS

5.1 INTRODUCTION

Road widening projects have typical potential impacts though these vary in accordance with the intensity of construction works involved, future scenario envisaged during the operation stage and the importance attached to the impacted environmental attributes. Since the project involves widening of the existing NH-7 from existing two lanes to four Lanes, the impacts will be confined to the proposed RoW. Subsequent sections detail out the likely impacts on various environmental components.

5.2 CLIMATE

By and large, there is no significant change expected in the macro-climatic setting (precipitation, temperature and wind) of the project corridor. However the microclimate is likely to be modified slightly due to removal of roadside trees and the addition of increased pavement surface. In addition, temporary loss of shade giving roadside trees will cause discomfort to the slow moving traffic and pedestrians.

5.3 LAND RESOURCES

5.3.1 Physical Settings

The project corridor traverses through plain tracts located between hillocks, especially in Salem Namakkal Stretch where rock out crops are observed. The Namakkal to Karur stretch passes through barren and also irrigated agriculture tracts of land. Since further rising of embankment height is not contemplated, fresh hindrance to the drainage pattern is not anticipated. The following impacts are likely on the physical setting along the corridor:

- Loss of productive lands along the corridor within the Corridor of Direct Impact that is presently being cultivated;
- Inappropriate disposal of wastes from the site;
- Indirect impacts at quarry and borrow locations during and after the period of construction; and
- Erosion of the murram surface from the embankment slope to be used for casing of the underlying sand fill.

Construction of the new pavement and embankment shall require, materials in relatively large quantities, viz. Aggregates (for bituminous concrete and Wet Mix Macadam layers) from quarries; Murram (for casing of embankment fill) from borrow pits; and Sand for (embankment fill) from borrow pits. Extraction of such materials will result in indirect impacts if the mentioned tasks are undertaken in an environmentally unsound fashion. The probable impacts in the likely quarry and borrow sites for the project is given in Table.1

Construction Material	Probable impacts
Aggregate	Formation of scars and steep slopes that are difficult to rehabilitate if full hillock is not exploited
Murram	Disturbance to top soil Loss of vegetation (if present) Formation of steep slopes on hill bottom jeopardizing hill stability

TABLE 1: SPECIFIC IMPACTS AT PROBABLE QUARRIES AND BORROW AREAS

Other general impacts include:

- Vibrations and noise due to blasting operations on nearby habitations;
- Danger of flying debris from the blasting if quarries are close to habitations, agricultural fields or cattle grazing grounds; and
- Air, dust and noise pollution in settlements along haul roads during transportation of the quarried material to the construction site.

Processing operations like crushing of the quarried rock leads to:

- Increase in SPM levels in the surrounding areas up to 800 $\mu g/m^3$; and
- High ambient noise levels during from crusher operations.

5.3.2 Soil

Soils in the Direct and the Indirect Impact Zone shall be impacted due to the proposed widening. Any impact in the direct impact zone is due to the actual construction;

where as in the indirect impact zone, impacts may be temporarily, if they serve as traffic detours, borrow areas, quarries and for construction camp.

Loss of Productive Land

The widening of road would require acquisition of agriculture lands at places where the available RoW is inadequate to accommodate the proposed improvements. The acquisition of agricultural land would cause loss of productive soil. Loss of productive land due to the road construction is a major long-term impact that results in depletion of fertile topsoil during the road construction phase. These impacts are likely to be significant along the 3 bypasses, wherein the alignment has been routed for a major length through agricultural lands to minimize resettlement impacts. The requirement for earthworks for the project has been worked out to be 6,50,000 cu.m.

Erosion Concern

Erosion of the top layer takes place as a result of construction and maintenance of the project corridor. During the construction phase, clearing of trees, construction of new fill slopes for grading bridge-end fills, possess high and pervasive potential for soil erosion. During operation or maintenance phase of highway erosion continues to occur in the areas not vegetated. Site most affected during the operational phase are generally bridge end fills and over steep banks, due to the long-term exposure to water and wind.

The project area is predominantly covered by red soil and for a significant length by sandy alluvial soil near to the Cauvery delta region. These soils are highly prone to erosion. All the bridge locations where elevated embankments are required would be more sensitive to the erosion during the construction period. 18 minor and 2 major bridges are located on the corridor. As a part of the road improvement programme, new under passes and flyovers will be provided in urban stretches. Such areas will also be vulnerable to erosion problems. However, small patches of black cotton soil are also observed in all three districts, which are more stable than the other two soil types of the project area and are highly resistant to erosion.

Construction Of New Bridges And Culverts

Two major bridges, one along the River Cauvery and the other along River Thirumanimuthar are to be constructed in the project. This involves excavation of riverbed and banks if the residual spoils are not properly disposed off, increased sedimentation downstream of the bridge may take place. During the construction phase some amount of drainage alteration and downstream erosion / siltation is also anticipated and can lead to alteration in drainage pattern and erosion / siltation; during the construction phase.

Quarries and Borrow Areas

Excavation of quarries and borrow pits used for obtaining rock, soil and aggregate material for road construction can cause major adverse environmental impacts, out of which removal of top soil is the major concern. The requirement for earthworks for the project has been worked out to be 6, 50,000 cu.m.

Compaction of Soil

Soil will be compacted during the site clearance and the construction activities due to the movement of vehicles and heavy machineries. This impact would be of short duration but adequate measures are to be undertaken to avoid the occurrence of any long-term impact.

Contamination Of Soil

Contamination of soil takes place both during construction and operation phases. The sites where in construction vehicles are parked and serviced are usually contaminating the soil because of leakage and or spillage of fuels and lubricants. Pollution of soil can also occur where Hot-Mix plants are located because of leakage or spillage of asphalt or bitumen. Refuse and solid waste from the labour camp can also contaminate the soil

5.4 WATER RESOURCES

Road construction has wide range of impact on the water resources, arising from activities such as earth moving, removal of vegetation, vehicles / machine operation and maintenance, handling and laying of asphalt, sanitation and waste disposal at labour camps. These mentioned activities lead to siltation, loss of water bodies through filling, as well as alteration of drainage, flooding, water logging and contamination of water bodies through solid and liquid waste.

Water is a limited resource in the project region. Salem and Namakkal district are notified as water scarce area. These regions are mainly dependent on ground water sources for meeting their water demand. The extraction of ground water for the construction purposes may increase the pressure on the available resources. The major adverse impacts on the water resources due to the project are discussed below:

5.4.1 LOSS OF WATER BODIES

The most significant adverse impacts to water bodies from the construction are the loss of storage capacity due to in filling by the earthmoving activities. Most of the water bodies that are likely to be impacted, are non-perennial. Therefore, conscious efforts have been made to minimize the impacts on these surface water bodies. Reduction of the area of these surface water bodies will be a moderate long-term negative impact during the construction and operation stages of the project.

There are 2 ponds located within the corridor of impact (ReferTABLE **2: PONDS IMPACTED ALONG THE PROJECT CORRIDOR**.2). The existing road has been constructed along the boundary of such ponds. The proposed widening would result in cutting across the embankments and /or partial filling of such ponds thereby ultimately resulting in reduction of their storage capacities.

TABLE 2: PONDS IMPACTED ALONG THE PROJECT CORRIDOR

Chainage	Direction	Distance from Existing CL	Village Name
214.600	East	0	Ammapalayan
230.200	East	25	Kolinjipatti

These ponds were found to be dry and filled with silt. During the construction period, particularly during the summer, sourcing of the project's water requirement would be difficult.

5.4.2 OTHER SURFACE WATER COURSES

The project corridor passes over 161 cross drainage structures, of which 141 are culverts, 18 are minor structures and 2 are major structures. The existing major structures are to be replaced with new structures, the minor structures and culvert may be retained as part of the widening option wherever the existing road cross sections are not critical.

Construction of the new structures when the channel is flowing may lead to drainage disruption through, haphazard dumping of the construction materials and wastes.
Roadside storage of construction materials too might lead to disruption in longitudinal drainage.

5.4.3 LOSS OF WELLS

A total of 161 wells are located within the proposed RoW. These wells are used for irrigation, domestic uses as well as for industrial purposes. The widening proposal of the project corridor will result in closure of 91 wells. To enhance the road safety the remaining 71 wells shall required protection measures as safety barriers.

5.4.4 LOSS OF OTHER WATER SOURCES

Widening of project entails removal and/ or shifting of water supply lines, removal of taps, wells, hand pump and tube wells within the proposed construction limits resulting in the loss of these facilities to the communities.

5.4.5 INCREASED RUN-OFF

Road construction activities will lead to an increased run-off both during the construction and operation stages. During the construction stage, removal of vegetation and compaction of soil leads to increased run-off during the monsoon. Similarly, the area of open ground lost to built-up black top surface increases the run-off from the open ground.

The project involves creation of two lanes to the side of the existing pavement of 7m and service lanes in urban sections. There will be increase in impervious layer due to addition of median, hardening and paving of shoulders and bitumen surface. Due to the creation of impervious surfaces, there will be an increase in the run-off. The increased run-off during operation stage can be worked out using the formula:
Increase in run-off per year (sq. m) = Increase in run-off coefficient due to construction * Annual rainfall in the area (m) * Area of the constructed surface (sq. m)
The appropriate run-off coefficient for project corridor is 0.55 for black cotton soil, which is predominant in our project corridor.

5.4.6 WATER QUALITY DEGRADATION

Water quality may be degraded during construction due to the disposal of solid and liquid waste from the labour camp, fuel and lubricant spills or leaks from the construction equipments, fuel storage and distribution sites and from the bitumen and asphalt storage at hot-mix plants. Major pollutants of concern due to above mentioned activities are suspended solids, oil and grease, lead and other metals. The most susceptible locations for contamination of water resources during construction are:

- Waterlogged areas that have water in them during the period of construction;
- Surface and ground water resources close to bitumen or asphalt storages at hot-mix plants, maintenance sites of construction vehicles; and
- Surface water bodies close to labour camps. During the operation stage possible water pollution of surface and ground water bodies shall be limited to:
- Runoff and wastewater from truck parking, filling stations and automobile repair shops;
- Accidental spills from vehicles carrying hazardous chemicals; and
- Open wells adjacent to construction sites

5.4.7 GROUNDWATER RECHARGE AND FLOW MODIFICATION

Ground water recharge areas may be reduced due to an increase in impervious surface resulting from compaction. Contamination of ground water due to the runoff carrying pollutants is of major concern because most of the domestic use is from ground water. 57 wells are located within a width of 30 m on either side of the project

corridor. These wells are very large and deep and are used for irrigation, domestic uses as well as for industrial purposes. The widening proposal of the project corridor will result in closure of these wells.

The ground water levels of the wells along the project corridor were studied on a sample basis. It is observed that the depth of the ground water table varies from 3 m to 30 m below ground level. The water table goes further down in Namakkal Taluk.

5.4.8 USE OF LOCAL WATER SUPPLY FOR CONSTRUCTION

Use of water for road construction possesses large demand of water, which results in significant strain on the local water supply. During the construction phase large quantity of water is used for the compaction, suppression, concrete and formwork, causing minor and short-term impact on the local water supply. The strain on water supply ceases after the construction is completed. This shall be a significant impact given that the corridor passes through areas with scarcity of water, and the blocks being categorized either as over-exploited or dark blocks in terms of extraction and availability of ground water.

5.5 FLORA

Due to the proposed four laning and geometric improvements, trees in the RoW are likely to be removed at several locations. As a rule of thumb all trees within the proposed construction limits would be removed for reasons of safety. (Refer TABLE). As part of landscaping and mitigation for this loss, for every tree to be cut two trees would be planted.

TABLE. 3: CLASSIFICATION OF TREES TO BE REMOVED

	30-60	60-90	90-120	>120	Total
Section 1	401	601	802	201	2005
Section 2	195	292	389	98	974
Section 3	181	271	362	91	905
Section 4	67	100	133	33	333
Total					4217

5.6 AIR QUALITY

Air Quality along the project corridor will be adversely impacted both during construction and operation stages, due to increase in the volume of the traffic. Subsequent sections emphasize on various impacts during the construction and operation phases of the project.

5.6.1 IMPACT DUE TO CONSTRUCTION OF ROAD

- Generation of dust
- Due to procurement and transportation of raw material from borrow sites and quarries to the construction site.
- Due to site clearance, and use of heavy vehicles, machinery & equipments.
- Due to material transfer in stone crushing units
- Due to the handling and storage of aggregates from hot mix plant
- Generation of fine particulates during the process of mixing the aggregates and bitumen in the asphalt plant
- Generation Of Exhaust Gases
- Hot mix plant is considered to be the major contributor of exhaust gases, which includes oxides of sulphur, hydrocarbons and particulate matter.
- Bitumen production also releases volatile toxic gases through the heating process.

5.6.2 IMPACT DUE TO THE OPERATION OF HIGHWAY

During the operational phase of the highway, there is an increase in the air pollution level due to the increased traffic volume. Vehicular emission level rises either due to inadequate vehicle maintenance or due to the use of adulterated fuel in vehicles.

5.6.3 PREDICTION OF AIR IMPACTS

- the incremental pollution levels along the project corridor at various receptors are studied for the years 2003-04, 2013-14, 2023-24 and 2033-34.
- The predictions have been made for the pollutants SPM, CO and NOx. The predicted concentration also takes into account the existing pollutant levels as established by the Ambient Air Quality Surveys.

As evident of Incremental CO Concentrations Predicted along the Project Corridor with the increase in traffic volume, the concentration of air pollutants also increases correspondingly. The increase in the CO concentration is comparatively higher than the remaining pollutants. But it is noteworthy to mention that the predicted levels of CO and NO_X are not significant even in year 2034. The predicted concentrations for CO and NOx at all locations for all horizon years are below the National Ambient Air Quality Standards specified for rural and residential areas. For Suspended Particulate Matter exceedance of the National Ambient Air Quality Standards (as specified for rural and residential areas) is observed at some of the receptors along the project road especially in the stretch between Salem and Puduchattaram (Km 207.600 to Km 234.700). It is observed that among the 37 receptors selected for simulation of pollution levels, the limits are exceeded at 10 receptors in 2004 and at 19 receptors in

2034. The mitigation/management measures proposed as a part of the project are likely to improve the air quality scenario along the corridor during the operation stage. Tree plantation as per the proposed road landscape strategy will help to attenuate the air pollution levels. The tree species suggested include broad-leaved tree species which can help settle particulates with their higher surface areas and thick foliage and reduce the distance for which particulates are carried from the road itself. This measure is of specific importance in context of the high SPM concentrations as predicted in some of the receptor locations. Other measures such as the reduction of vehicular emissions, ensuring vehicular maintenance and up-keep, educating drivers about driving behavior / methods that will reduce emissions are beyond the scope of the project but will be far more effective in reducing the pollutant levels.Apart from provision of the mitigation measures, their effectiveness and further improvement in designs to reduce the pollutant levels with increase in traffic shall be monitored. A monitoring plan to this effect will be prepared as a part of the Environmental Management Plan (EMP).

5.7 NOISE LEVELS

Noise is perceived as one of the most undesirable consequences of road development. Though the level of discomfort caused by noise is subjective, there is a definite increase in discomfort with an increase in noise levels. The most commonly reported impacts of increased noise levels are interference in oral communication and disturbance in sleep.

Error! Reference source not found. highlights the Ambient Noise Standards according to the Noise Pollution (Control and Regulation) Rules, 2000 under the section 6 and section 25 of the Environment (Protection) Act, 1986 (29 of 1986) read with rule 5 of the Environment (Protection) Rules, 1986.

The impacts on noise quality due to the project will be of significance in both the construction as well as the operation stages.

TABLE 4 AMBIENT NOISE STANDARDS

Land use	Limits in dB(A) Leq *	
	Day Time	Night Time
Industrial area	75	70
Commercial area	65	55
Residential area	55	45
Silence Zone	50	40
*dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing. Nightime: 10:00 pm – 6.00 am		

5.7.1 CONSTRUCTION STAGE

Due to the various construction activities, there will be short-term noise impacts in the immediate vicinity of the project corridor. The construction activities include:

- Excavation for foundations with excavators;
- Grading and compaction of the site with graders and rollers; and
- Construction of cross drainage structures and other facilities.

Though the noise levels for the construction activities far exceed the permissible standards, it is important to note that the construction noise is generally intermittent and depends on the type of operation, location and function of the equipment. Proper mitigation measures like regulation of timings of construction, employing noise protection measures etc., need to be worked out.

5.7.2 OPERATION STAGE

With the increase in traffic noise levels are expected to increase along the project corridor. However, with reduced congestion levels as a result of widening of the corridor and improvement of road surface, noise levels are going to be considerably lower in the with project scenario.

5.8 COMMUNITY FACILITIES

A conscious effort is made to avoid impacts on the community facilities along the proposed alignment. However some of the properties of community facilities are being impacted upon to varying degrees. Geometric improvements to the corridor and the acquisition of a uniform RoW of 60m along the corridor necessitated encroachment onto the utilities.

5.9 CULTURAL PROPERTIES

5.9.1 ARCHAEOLOGICAL PROPERTIES AND PROTECTED MONUMENTS

As no archaeologically significant property or site or Protected monument lies within 7 km of the project corridor no impact on archaeological properties/historic sites and protected monuments are likely.

5.9.2 OTHER CULTURAL PROPERTIES

The likely impacts on cultural properties have already been discussed in the Preliminary Environmental and Social Report. These impacts are essentially subject to the location of the Cultural property in/on edge of the ROW and their extent varies and has been identified for each stage of Construction.

TABLE ..5 DETAILS OF ACCIDENT RATES AT VARIOUS DISTRICTS

DETAILS	2005	2006	2007	2008	2009
Number of Major Accidents in the study area of Salem revenue District. (Km 207+600 to Km 216+600)	44	40	42	28	18
Number of Major Accidents in the study area of Namakkal District. (Km 216+600 to Km 275+600)	53	64	72	32	24
Number of Major Accidents in the study area of Karur District. (Km 275+600 to Km 292 + 600)	33	37	32	24	13

Direct Adverse impact on the Cultural Property will take place in case the Cultural Property is located within the Proposed Formation width and Indirect adverse impact is envisaged in case the property lies within the Proposed Embankment width of the Road. The likely impacts on each Cultural Property have been estimated on basis of the geometric section likely to be adopted at location of the Cultural Property.

5.10 SOCIAL ENVIRONMENT

The chapter on baseline environmental characteristics provides information on the nature, type and extent of impacts on private land, structures and other assets due to the proposed widening. The impacts on the communities, the loss of livelihood and other social impacts associated in the project are discussed in the report on Resettlement Action Plan (RAP)

TABLE 6 MARKET VALUE OF LAND

Location	2004 Lakhs / Acre	2006 Lakhs / Acre	2008 Lakhs / Acre	2010 Lakhs / Acre
Salem Bye pass Seelanaic kenpatty	60	150	300	400
Athanur & Cross	25	40	75	100
Rasipuram & cross	35	50	80	100
Andalur Gate	40	60	90	125
Pacchal	15	46	60	150
Pudhan chanthai	20	32	75	125
Sellappam aptti	24	36	83	200
Namakkal & cross	30	45	75	250
Velur	13	32	1,00	240
Velayu tham Palayam	12	26	53	110
Karur Bye Pass	30	58	125	200

6. SUMMARY

Environmental Impact Assessment is an integral part of any developmental activity. We need to present the EIA report before commencing the development activity. Hence the need to conduct baseline study and assessment of the impacts are highly essential. The present project work is undertaken with a goal to assess the potential impacts of the project corridor from Salem to Karur NH7 4 laning of highway and to suggest the suitable mitigation measures.

After an extensive review of literature on the highway environmental impact assessment of various places, the study area Salem to Karur NH7 was selected for the study. The baseline characteristic of the study area existed before 4 laning work were collected from the collectorates of Salem, Namakkal and Karur.

The baseline environmental status such as climate, physiography and terrain, geology and soil, water resources, noise levels, forests and protected areas, plantations, cultural environments, community facilities and social environment were done. A Statistical data of the above characteristics are submitted here in this work.

The main objective of this work is to collect the assessments of impacts that have taken place during and after completion of the 4 laning of NH7 from Salem to Karur. Here also the impacts both positive and negative such as climate conditions, land resources, water resources, flora, air quality, community facilities, cultural properties, social environment were collected and analysed for making mitigation measures.

7. CONCLUSION

In this research work, the baseline environmental status and the potential environmental impacts for the study area were submitted. The positive impacts include the following.

- Reduced noise and air pollution.
- Reduced risk of accidents
- Improved accessibility and connectivity.
- Reduced vehicle operating and maintenance cost.
- Savings in fuel consumption.
- Improved Facilities to Road users.
- Improved Quality of life.
- Generation of Local employment.

Some of the direct and indirect negative impacts of the project are,

- Filling in low lying areas for embankment of the roads.
- Cutting of large number of trees.
- Increased Noise pollution in future due to vehicular movement increase.
- Impact on natural drainage area of the project corridor under study .

Anyhow, no significant adverse impacts are anticipated due to the proposed project, However, the temporary impacts on water quality, Air quality, noise levels, soil quality, flora and social economic environment of the project area are anticipated. Hence suitable mitigation measures should be made when and then with periodical community consultation. Proper implementations of traffic rules by traffic police, proper maintenance of traffic signs and implementation of accident care facilities by the project implementation agency, road side tree plantation to be restored and maintained. Development of green belt with selected species of trees for absorbing noise should be made. Use of horn should be restricted in main sensitive locations like schools and hospitals through the use of proper sign boards. The area drainage system and flood water drain should be periodically cleared. There should be periodical monitoring of soil quality, water quality, air quality and noise levels.

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