



Executive Summary (English) of Environmental Impact Assessment (EIA) Report

*Development of 6-lane access controlled spur to
Haridwar from Delhi-Saharanpur-Dehradun
Economic Corridor in the States of Uttar Pradesh
& Uttarakhand*

Project Proponent : National Highway Authority of India
Ministry of Road, Transport & Highways, Govt. of India

Environmental Consultant : Feedback Infra Private Limited, Gurugram

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For National Highway Authority of India
Feedback Infra Private Limited



EXECUTIVE SUMMARY

1.1 Introduction

Government of India has decided to develop Delhi – Saharanpur - Dehradun Expressway to improve the efficiency of freight & transport movement in the region. The project proponent for the Project is National Highways Authority of India (NHAI).

The project being discussed under this report concerns the development of spur to Haridwar from Delhi – Saharanpur- Dehradun economic corridor near Halgoya village in Saharanpur district of Uttar Pradesh and ends at existing Ch. 182+070 of NH-334 near Badheri Rajputan village in Haridwar district of Uttarakhand. The Project is planned as 6 lanes with provision of service road at some locations.

1.2 Need of the Project

The proposed Expressway will improve connectivity from Delhi to Haridwar. At present the traffic from Delhi to Haridwar follows NH 334 (Old NH No. 58) passing through Ghaziabad, Modi Nagar, Meerut, Muzaffarnagar and Roorkee. NH 334 (Old NH No.58) is 4-lane in most of the length and passing through Built-up/Semi Built-up areas at some sections. NH 334 is partially access controlled highway with at-grade junctions and median openings. Traffic on NH 334 (Old NH No.58) nearer to Roorkee is 36176 PCU.

The distance between Akshradham/Delhi to Haridwar/Har Ki Pauri through DME and existing NH 334 (Old NH No.58) is 210 km and it takes around 5 hrs travel time. Haridwar/Rishikesh are an important religious pilgrim centre. Haridwar is a gateway to other hill cities and temples of Uttarakhand, the traffic bound to the most important pilgrimage circuit in Uttarakhand, Chardham comprising Yamunotri, Gangotri, Kedarnath temple and Badrinath temple also passes through Haridwar. The number of pilgrims who visited the Chardham tour has been continuously increasing. The pilgrims visit Haridwar and Rishikesh in the entire year but more so during the winter.

The existing NH-334 (Old NH No. 58), is packed with pilgrims and tourists during pilgrimage season or during important festivals. Tens of millions of pilgrims attending the Kumbh Mela in January to March at Haridwar will use this highway extensively.

More than 50 million devotees attended the last Kumbh Mela. The existing NH 334 beyond Haridwar, will also connect the border with Tibet passing through Chamoli, Joshimath, Badriath and finally to Mana Pass near the border with the Tibet

1.3 Project Area

Project section covers 43.9 Km of length distributed in Saharanpur & Haridwar districts of Uttar Pradesh & Uttarakhand states respectively.

1.4 Project Proponent

National Highways Authority of India (NHAI), an autonomous agency of the Government of India, is responsible for management of the network of national highways across the country. It is a nodal agency of the Ministry of Road Transport and Highways (MoRTH), Government of India. NHAI vision is to meet the nation's need for the provision and maintenance of national highways network to global standards and to meet user expectations in time-bound and cost-effective manner, within the strategic policy framework set by the Government of India and thus promoting economic well-being and quality of life of the people.

NHAI is the nodal authority / project proponent for the development of the highway project under present study.

1.5 Environmental Impact Assessment (EIA) Study

The study methodology for the EIA employs a simplistic approach in which the important environmental issues have been identified before initiation of the baseline study. Based on the identification baseline data for Spur to Haridwar was collected during the study period from March 2021 to May 2021. This data has analysed to predict and quantify the impacts and suggest best suited mitigation measure to mitigate the identified impacts.

1.6 Policy, Legal and Administrative Framework

As part of the project execution, the following clearances and NOCs has to be obtained by NHAI & the contractors:

- Prior Environmental Clearance from MoEF&CC under the purview of EIA Notification 2006 & its subsequent amendments, as the proposed project is a development of new national highway
- Forest clearance as the proposed alignment is passing through strip forests declared as protected forests alongside roads, canals and railway lines
- Prior permission for felling of trees from Forest dept. / District Authorities
- Compensate the affected households as per entitlement matrix based on Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation & Resettlement Act 2013
- Prior Environmental Clearance from MoEF&CC / SEIAA by the Contractors for sand and aggregate quarries, wherever and if required
- NOC and Consents under Air & Water Acts for establishing and operating the construction plants including but not limited to hot mix plants, WMM, crushers etc. from State Pollution Control Board
- NOC under the Hazardous and Other Wastes (Management and Trans-boundary Movement) Rules, 2016 from SPCB
- PUC certificate for use of vehicles for construction from Transport department
- NOC for water extraction for construction and allied works from Irrigation department
- Conversion of land use from the revenue department for setting camps and plants
- Approval of Monitoring Consultant / Supervision Consultant / Authority Engineer for location and layout of Camps & plants before start of Construction
- Approval of Monitoring Consultant / Supervision Consultant / Authority Engineer for Traffic Management Plan before start of Construction
- Approval of Monitoring Consultant / Supervision Consultant / Authority Engineer for the Emergency Action Plan for accidents responding to involving fuel & lubricants before the construction starts

1.7 Baseline Environmental Profile

1.7.1 Physical Environment

Climatology

The climate of region is moderate subtropical to humid climate with three distinct seasons viz. summer followed by rainy and winter seasons. The climate of the project district is characterized by general dryness, bracing cold season and a hot summer.

Topography

The proposed alignment mostly follows plain terrain. The elevation varies from ~256 m above MSL to ~276 m above MSL at different locations. Average elevation of the project stretch is ~265 m above MSL.

Geology

The district Haridwar is covered by high steep hills of Himalayas called Siwalik Range. The most range lying just north to the district the upper Siwaliks followed by middle Siwaliks are exposed. Saharanpur district is underlain by thick fluvial Quaternary sediments, deposited by Yamuna River and its tributaries. Sediments comprise sand, silt, clay and kankars (calcareous concretions) in varying proportions and show quick alteration from finer to coarser at places.

Soil

Soil samples were collected from 4 representative locations for assessment of soil characteristics. The texture of soil is found to be Silty, Sandy loam and Sandy in nature. Available phosphorous in soil samples along the study area ranges from 0.01 % wt./ wt. to 0.014 % wt./ wt. Potassium content as K in soil samples in the study area is found in the range of 0.012 % wt./ wt. to 0.017 % wt./ wt. Total organic carbon in soil samples in the Study area is found in the range of 0.016 – 0.024 % wt./ wt., therefore the soil is fertile in terms of productivity.

Ambient Air Quality (AAQ)

Ambient air quality monitoring has been done at evenly distributed 6 locations along the proposed alignment. The results indicate that all air quality parameters are within the standards specified in the NAAQ except Bricklin @ village Basera (AAQ2) & NH 334, @ Badheri village.

Ambient Noise Level (ANL)

Noise monitoring has been carried out once during the entire study period at 6 locations along the alignment for a period of 24 hours. Day & Night-time Leq has been computed from the hourly Leq values as per standards. The Noise quality result presented in below table shows that Leq Day time varies from 51.3 to 63.3 dB(A) and Leq Night-time varies from 40.6 to 54.1 dB(A). At NH-334 Badheri village noise level was found crossing the standards due to day-to-day activities in nearby villages and vehicular operation on existing roads.

Surface Water

Surface water quality along the project stretch was monitored at 4 representative locations along the alignment as per the parameters laid down by Central Pollution Control Board for surface water quality criteria. The surface water in the project was found slightly alkaline with pH varying from 7.244 to 8.17 locations along the alignment. The reason for alkalinity may be the excessive use of fertilizer in agricultural fields.

Ground Water

Keeping in view the importance of ground water to the local population, 4 representative ground water sampling locations along the alignment were identified and samples were analysed for assessment of ground water quality.

The results shows that pH was found ranging from 7.5 to 7.92 in ground water samples taken along the proposed alignment. The chloride content varied between 16 to 126 mg/l. The Fluoride content was found within the maximum permissible limit (1.0 mg/l) in drinking water as prescribed by BIS. The concentration of Nitrate ranges between 8 to 15 mg/l. The concentration of iron in ground water was found within the permissible limits.

1.7.2 Biological Environment

Protected Areas

The proposed alignment is neither passing through nor falling within 10.0 km radius of any National Park or Wildlife Sanctuary.

Forest

Project Road transverse through both Uttarakhand and Uttar Pradesh States. As per the India State of Forest Report, 2019, the Forest Cover in the State of Uttarakhand and Uttar Pradesh is 24,303.04 sq. km and 14,805.65 respectively.

The proposed alignment is passing through strip forests declared as protected forests alongside roads, canals and railway lines. The total protected forest area is approx. 5.0 ha. Hence, there will be diversion of forest land and necessary clearances shall be obtained as per requirements under Forest (Conservation) Act, 1980.

1.7.3 Social Environment

Census Profile

The population of Uttarakhand as per Census 2011, is of 1.01 Crores, an increase from figure of 84.89 Lakh in 2001 census. Total population of Uttarakhand as per 2011 census is 10,086,292 of which male and female are 5,137,773 and 4,948,519 respectively.

As per details from Census 2011, Uttar Pradesh has population of 19.98 Crores, an increase from figure of 16.62 Crore in 2001 census. Total population of Uttar Pradesh as per 2011 census is 199,812,341 of which male and female are 104,480,510 and 95,331,831 respectively.

Workforce in Project area

The people in the villages are mostly engaged in the agricultural work and economy is largely based on agricultural activities. Some people are also working in nearby industries and brick kilns.

1.8 Public Interactions & Consultation

Public Interactions & consultations were conducted during the project preparations. The main purpose of these consultations was to know the community's reaction to the perceived impact of proposed project on the people at individual and settlement level.

1.9 Potential Environmental Impacts

The environmental components are mainly impacted during the construction and operational stages of the project and must be mitigated for and incorporated in the engineering design. Environmental mitigation measures represent the project's endeavour to reduce its environmental footprint to the minimum possible. These are conscious efforts from the project to reduce undesirable environmental impacts of the proposed activities and offset these to the degree practicable. Enhancement measures are project's efforts to gain acceptability in its area of influence. They reflect the pro-active approach of the project towards environmental management. Slight change in the micro-climate of the area is expected due to heat island effect as unpaved area will be converted into the paved road. However, Impact on the climate conditions from the proposed road project will not be significant in long run as removal of vegetation will be compensated by compensatory plantation.

1.9.1 Impact on Air Quality

There will be rise in PM levels during the construction activities, which shall again be within prescribed limit after the construction activities are over. The level of CO is likely to be increased, however, level shall remain within prescribed standards.

1.9.2 Impact on Noise Levels

The area is likely to experience an increment in noise level due to increase in vehicle density after road strengthening. Construction camp shall be established at least 1000m away from nearest habitation and forest area. Temporary noise barriers should be provided surrounding the high noise generating construction equipment during work near to settlement area. Avenue plantation have been proposed on either side of the highway to control the associated air and noise pollution.

1.9.3 Impact on Water Resources and Quality

The construction and operation of the proposed project roads will not have any major impacts on the surface water and the ground water quality in the area. Design made to avoid physical loss to the water bodies to the extent possible. Contamination to water bodies may result due to spilling of construction materials, oil, grease, fuel and paint in the construction camp. This will be more prominent in case of locations where the project road crosses drains, ponds, etc. Silt fencing shall be provided along the major canals and pond. Oil interceptors are proposed near fuel handling areas.

1.9.4 Impact on Ecological Resources

Trees within ROW are likely to be affected due to the proposed development leading temporally loss of micro ecosystem. However, on the long run the impacts will be compensated in terms of compensatory and avenue plantation. The proposed alignment is passing through strip forests declared as protected forests alongside roads, canals and railway lines and approx. 4.0 ha. diversion of forest land is required.

1.9.5 Impact on Land

During the construction of the proposed project, the topography will change due to cuts & fills for project road and construction of project related structures etc. Provision of construction yard for material handling will also alter the existing topography. The change in topography will also be due to the probable induced developments of the project.

1.9.6 Social Impacts

About 296.618 ha of land is required for proposed highway. Total number of PAHs are affected are 67, and they are owned by 59 titleholders (TH) and 8 tenants. Total 67 PAFs comprises 270 PAPs. There are BPL-9, WHH- 1, and SC-3 households among the affected households.

1.10 Analysis of Alternatives

Detailed analyses of the alternatives have been conducted taking into account both with and without project. The proposed development of greenfield highway is likely to have a positive impact on the economic value of the region. However, there are certain environment and social issue, these needs to be mitigated for sustainable development.

1.11 Mitigation Avoidance & Enhancement Measures

Mitigation and enhancement measures have been planned for identified adverse environmental impacts. The construction workers camp will be located at least 1000 m away from nearby habitations. Hot mix plants, batching plants, etc. will also be located more than 1000 m away from habitations and in downwind directions. Existing cross drainage structures have been planned to

maintain for proper cross drainage. In order to compensate negative impacts on flora due to cutting of trees the project plans compensatory plantation in the ratio of 1:10 i.e. for every tree to be cut, ten trees will be planted. The project shall also witness the plantation of trees for providing aesthetic beauty and shade. As the space for compensatory plantation might not be adequate along the project road, this plantation shall be taken up by the forest department, after payment of the cost for raising and maintaining the saplings for five years. The project will take an opportunity to provide environmental enhancement measures to improve aesthetics in the project area. The planned environmental enhancement measures include plantation in available clear space in ROW, enhancement of water bodies etc. In order to avoid contamination of water bodies during construction Silt fencing, oil interceptors at storage areas and at construction yard have been proposed. The affected households shall be compensated as per the entitlement matrix based on Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation & Resettlement Act 2013.

1.12 Institutional Requirements & Environmental Monitoring Plan

The responsibility of implementing the mitigation measures lies with environment team duly appointed by the Contractor/Concessionaire. The overall supervision of Environmental monitoring works during construction and operation stage shall be carried out by NHA with the help of the Monitoring Consultant / Supervision Consultant / Authority Engineer. To mitigate the potential negative impacts of proposed development and measurement the performance of mitigation measures, an Environmental Monitoring and Management Plan is developed. The formulation of an appropriate environmental monitoring plan and its diligent implementation are keys to overall success for the project.

1.13 Environmental Management Plan

Project specific environmental management plan have been prepared for ensuring the implementation of the proposed measures during construction phase of the project, implementation and supervision responsibilities. The cost for environmental management during construction has been indicated in EMP. The project impacts and management plan suggested thereof are summarized in next section.

1.14 Environment Impact & Management Matrix

Table Error! No text of specified style in document.-1: Environment Impact & Management Matrix

Particulars	Stages	Potential Impacts	Mitigation Measures
Physiographic Environment			
Topography	Preconstruction & Construction	<ul style="list-style-type: none"> Slight changes are expected due to development of the road Impacts are marginal, but permanent. 	<ul style="list-style-type: none"> Proper planning to keep the land reformation upto bare minimum No new quarry for the project
Geology	Preconstruction & Construction	<ul style="list-style-type: none"> Impacts are moderate because of extraction of sand 	-
Climate			

Particulars	Stages	Potential Impacts	Mitigation Measures
Temperature / Rain fall / Humidity	Preconstruction & Construction	<ul style="list-style-type: none"> Tree felling will have an impact of micro-climate of the area Heat island effect due to increase in paved roads Low spatially restricted short-term impact 	<ul style="list-style-type: none"> Compensatory plantation in 1:10 ration of the trees to be cut With the proposed avenue plantation scheme, the micro climate of the project corridor will be smoothed
Land			
Loss of Other Land	Design, Preconstruction & Construction	<ul style="list-style-type: none"> Loss of Property & Livelihood 	<ul style="list-style-type: none"> Compensation as per LARR, 2013
Induced Development	Preconstruction & Construction	<ul style="list-style-type: none"> Insignificant change in the land use pattern 	<ul style="list-style-type: none"> Civil authorities to plan and guide any induced development under regulatory framework
Soil			
Soil Erosion	Preconstruction, Construction & Operation	<ul style="list-style-type: none"> In Road slopes and spoils Erosion in excavated areas 	<ul style="list-style-type: none"> Embankment protection through pitching & turfing Regular water sprinkling in excavated areas
Contamination of Soil	Preconstruction, Construction & Operation	<ul style="list-style-type: none"> Scarified bitumen wastes Oil and diesel spills Emulsion sprayer and laying of hot mix Production of hot mix and rejected materials Residential facilities for the labour and officers 	<ul style="list-style-type: none"> Hazardous and Other Wastes (Management and Trans-boundary Movement) Rules, 2016 Oil Interceptor will be provided in storage areas for accidental spill of oil and diesel Rejected material to be laid as directed by monitoring consultant. Septic tank to be constructed for waste disposal.
Water			
Impact on Water Resource	Design, Preconstruction, Construction & Operation	<ul style="list-style-type: none"> Depletion of ground water recharge Contamination from fuel and lubricants & waste disposal in camp area Contamination of surface water system due to run-off from road construction area 	<ul style="list-style-type: none"> Provision of Storage/harvesting structure of water, wherever feasible Oil Interceptor and Septic tank in construction camp Enforcement of Hazardous and Other Wastes (Management and Trans-boundary Movement) Rules, 2016 Both side drain facility to suitably divert the run-off from roads
Air			

Particulars	Stages	Potential Impacts	Mitigation Measures
Dust generation	Preconstruction & Construction	<ul style="list-style-type: none"> Shifting of utilities, removal of trees & vegetation, transportation of material 	<ul style="list-style-type: none"> Regular Sprinkling of Water Fine materials to be completely covered, during transport and stocking. Hot mix plant to be installed in down wind direction with at least 1000m distance from nearby settlement. Regular monitoring of particulate matter in Ambient Air
Gaseous pollutants	Preconstruction, Construction & Operation	<ul style="list-style-type: none"> Operation of Hot mix plant and vehicle operation for material transportation 	<ul style="list-style-type: none"> Air pollution Norms will be enforced. Only PUC certified vehicle shall be deployed Labourers will be provided with mask. Regular gaseous pollution monitoring in ambient air
Ambient air quality	Operation	<ul style="list-style-type: none"> Air pollution from traffic CO level is likely to increase 	<ul style="list-style-type: none"> Compliance with statutory regulatory requirements
Noise			
Pre-Construction Activity	Pre-Construction	<ul style="list-style-type: none"> Man, material and machinery movements Establishment of labour camps, onsite offices, stock yards and construction plants 	<ul style="list-style-type: none"> No Horn Zone sign, Speed Barriers near sensitive receptors Camps will be setup more than 1000m away from settlements.
Construction Activity	Construction	<ul style="list-style-type: none"> Operation of high noise equipment like hot mix plant, diesel generators etc. Community residing near to the work zones. 	<ul style="list-style-type: none"> Camp will be setup more than 1000m away from the settlements, in down wind direction. Noise pollution regulation to be monitored and enforced.
Operation Stage	Operation	<ul style="list-style-type: none"> Indiscriminate blowing of horn near sensitive area 	<ul style="list-style-type: none"> Restriction on use of horns No Horn Zone sign.
Ecology			
Flora	Preconstruction, Construction	<ul style="list-style-type: none"> Loss of vegetation cover Felling of 24700 of trees 	<ul style="list-style-type: none"> Felling of only unavoidable trees Compensatory Plantation in the ratio of 1:10

Particulars	Stages	Potential Impacts	Mitigation Measures
Fauna	Preconstruction, Construction & Operation	<ul style="list-style-type: none"> • Loss of insect, avian and small mammalian species due to felling of trees • Impact on Dolphin and Gharials present in Beas River Conservation Reserve • Impact on migratory birds in Kali Bein Conservation Reserve (if any) • Accidental run over 	<ul style="list-style-type: none"> • Compensatory Plantation • Speed breaker, Signage and limit in sensitive areas • Construction of Cable Stayed Bridge over Beas River • Construction of single span girder over Kali Bein River
Social			
Socio Environment	Design, Preconstruction & Construction	<ul style="list-style-type: none"> • Loss of Property & Livelihood • Loss of CPRs, Religious Structures 	<ul style="list-style-type: none"> • Compensation as per LARR, 2013 • Relocation of CPRs, Religious Structures to suitable place
Public Health and Road Safety			
Health and safety	Preconstruction, Construction & Operation	<ul style="list-style-type: none"> • Psychological impacts on project affected people • Migration of worker may lead to sanitation problem creating congenial condition for disease vectors • Discomfort arising of air and noise pollution • Hazards of accident 	<ul style="list-style-type: none"> • Continued consultation with PAPs and the competent authority for speedier settlements of appropriate compensation package and resettlement. • Ensuring sanitary measures at construction camp to prevent water borne disease and vector borne disease. • Provision for appropriate personal protective equipment like earplugs, gloves gumboot, and mask to the work force. • Safe traffic management at construction area. • Drive slow sign and speed barriers near community facilities like school, hospital, etc.

1.15 Conclusions

Based on the EIA study and surveys conducted for the Project, it can be safely concluded that associated potential adverse environmental impacts can be mitigated to an acceptable level by adequate implementation of the measures as stated in the EIA Report. Adequate provisions shall be made in the Project to cover the environmental mitigation and monitoring requirements, and their associated costs as suggested in environmental budget. The proposed project shall improve trade efficiency and bring economic growth. In terms of air and noise quality, the project shall bring considerable improvement to possible exposure levels to population.