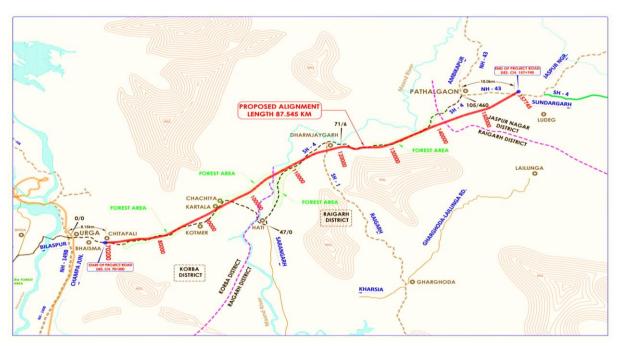


Urga – Pathalgaon section of NH-130A

[Raipur Dhanbad Economic Corridor]

Development of Economic Corridor to improve the efficiency of freight movement in India under Bharatmala Pariyojana

Total Length - 87.545 km.











EXECUTIVE SUMMARY

1.1 Introduction

The Government of India has taken up development of Economic Corridors, Inter Corridors, Feeder Corridors and National Corridors to improve the efficiency of Freight Movements in India under Bharatmala Pariyojana.

The proposed Project is a greenfield highway with 4 lane configuration dual carriageway from Urga to Pathalgaon section of NH-130A. The Project is being developed under Bharatmala Pariyojana, Lot 3/ Package-1 and is a part of Raipur-Dhanbad Economic Corridor. The Project shall follow the 4 lane standards as per IRC SP 84-2019.

1.2 Need of the Project

The proposed Expressway will improve connectivity, reduce congestion on proposed Corridors, enhance logistic efficiency and reduce logistics costs of freight movements, and improve the existing socio-economic conditions of the Project area. It would thereby, contribute to the developmental goals envisaged by NHAI, MoRT&H, Government of India and enhance the growth potential of the Project area.

The existing carriageway is nearly 105 km from Urga to Pathalgaon having single lane width from Urga to Dharmjaygarh for length of 70 km and intermediate lane carriageway from Dharmjaygarh to Pathalgaon for a length of 35 km stretch. The existing geometry is very substandard and requires geometric correction at many locations.

Total length of the proposed alignment will be 87.545 km, which will lead to 17.5% reduction in the length of travel between Urga and Pathalgaon, thus, saving the fuel and time of commuters.

1.3 Project Area

The proposed Greenfield Highway alignment starts from Bhaisma village at chainage 8/150 of State Highway-04 and terminates near Turua Ama village, 10 km away from Pathalgaon along NH-43 towards Jharkhand border.

1.4 Project Proponent

National Highways Authority of India (NHAI), a nodal agency of the Ministry of Road Transport and Highways (MoRT&H), Government of India is responsible for management of the network of national highways across the country. 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. The 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 and analyses of the environmental issues identified. A reconnaissance survey was undertaken for identification of Valued Environment Components (VECs) falling within the Right of Way (RoW) of the Project. Thereafter, for assessing the baseline status of the environment, primary monitoring was carried out for ambient air noise, ground, and surface water at various locations in proposed project stretch. The monitoring locations were identified to determine baseline pollution levels, vicinity of habitation and identified sensitive receptors, land use, accessibility, etc. The collection and analysis of data for each component were carried out by National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited laboratory as per MoEF&CC and CPCB prescribed guidelines. The results of the monitoring were compared with the relevant national standards. This baseline data was 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 for the Project:

- Prior Environmental Clearance from MoEF&CC under the purview of EIA Notification 2006 and its subsequent amendments.
- Forest clearance as the proposed alignment is passing through protected forest.
- Prior permission for felling of trees from Forest dept./District Authorities
- Compensate the affected households as per entitlement matrix based on the 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 from State Pollution Control Board (SPCB) under Air and Water Acts for establishing and operating the construction plants including but not limited to hot mix plants, WMM, crushers etc.
- 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







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 Approval of Monitoring Consultant / Supervision Consultant / Authority Engineer for the Emergency Action Plan for accidents responding to involving fuel and lubricants before the construction starts

1.7 Baseline Environmental Profile

1.7.1 Physical Environment

Climatology

The proposed alignment area is endowed with sub-tropical monsoon climate with three distinct seasons i.e., summer, monsoon, and winter.

The summer extends from March to mid-June. The southwest monsoon starts from June and continues till middle of September. Winter season spreads from October and lasts till end of February.

Physiography

The landform along the stretch of project road is plain to undulating with highly varying elevations as low as 261m amsl to 582m amsl.

Geology

Project region is dominantly occupied by Indo-Gangetic plain region. The geological structure of the region is formed of Alluvium rocks of Recent period containing deposits of clay, silt, sand, and loose gravels.

Land- Use Pattern

The land use within 500 m buffer of the proposed project stretch is mainly agricultural land with 50.7% followed by area cover with patches of natural vegetation including forest while, in 10 km buffer of the proposed project stretch, forest is the major land cover.,

Drainage

The proposed alignment crosses Major Rivers/canals at the following locations –

- a) Pansari Nala at 82+560.
- b) Kortimasara Nala at 89+165.
- c) Chuiya Nadi at 99+825.
- d) Maand River at 106+375.
- e) Chikatwani Nala at 120+470.
- f) Bharari Nala at 145+500.

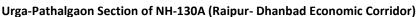
Soil Quality

The soil of the Project affected area is found to be Silty to Silty Clay in nature.

Soil samples were collected from 08 representative locations for assessment of soil characteristics of the proposed alignment. pH of soil in the study area were found in the range between 7.34 to









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8.06. Conductivity of the soil ranges from 99 to 208 μ S/cm. Since the EC value is less than 4000 μ S/cm, the soil is saline in nature.

Ambient Air Quality

Ambient air quality monitoring was carried out at 08 locations along the proposed alignment at a frequency of two days per week at each location for three months.

The results indicates that overall concentrations of all air quality parameters i.e., PM10, PM2.5, SO2, NO2 and CO were observed within the standards specified in the NAAQS in absence of any major pollution generation activities near study area.

Ambient Noise Quality

Noise monitoring has been carried out once during the entire study period at 08 locations along the alignment for a period of 24 hours. Day and night-time Leq has been computed from the hourly Leq values as per standards. The Noise quality results indicates that all noise level values during daytime and night-time were within prescribed limits as per CPCB Guidelines.

Water quality

Surface Water

The pH value of the collected ground water in the study area found to be in the range from 7.14 to 7.72 and conductivity observed in the range 276 μ S/cm to 342 μ S/cm. TDS values were observed to be in range from 188 mg/L to 224 mg/L. Total alkalinity is found to be the range from 60 mg/L to 175 mg/L and Total Hardness ranges from 60.0 to 130 mg/L. The values of Chloride, Fluoride, Nitrate and Sulphate etc, were observed within permissible limit. Most of the metals are observed to be within the detection limit while, total Coliforms were absent.

Ground Water

The pH value of the collected ground water in the study area found to be in the range from 5.9 to 7.34 and conductivity observed in the range 90 μ S/cm to 987 μ S/cm. TDS values were observed to be in range from 58 mg/L to 612 mg/L. Total alkalinity is found to be the range from 14.0 mg/L to 320 mg/L and Total Hardness ranges from 20.0 to 430 mg/L. The values of Chloride, Fluoride, Nitrate and Sulphate etc, were observed within permissible limit. Most of the metals are observed to be within the detection limit while, total Coliforms were absent.

1.7.2 Biological Environment

Protected Areas

Bird International's IBAT (Important Bird Area Tool) was used to check the presence of any Eco sensitive biodiversity area within the Project study area. It is found that no eco-sensitive zone such as National Park, Wildlife Sanctuary, Bio-sphere Reserve of Wildlife sanctuary or national park located within 10 km from project stretch. However, the proposed alignment passes through the Elephant Corridor.

Forest

There will be diversion of 169.998 ha of protected forest land for the Project therefore, necessary







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clearances shall be obtained as per requirements under Forest (Conservation) Act, 1980.

Flora and Fauna

The natural vegetation of project study area includes Sal, Teak, Banyan, Mahua, Neem, Peepal, Arjuna, Kadam, Sal, Amaltas, Bargad, Jamun, Fig, Palm, Sagwan, Tamarind, Mango and Ber etc.

The Fauna in the study area comprises of Jackals, Monkeys, Deer, Buffalos, Barasinghas, Nilgai, Sambar, Chinkara, Dhole (Wild Dog), Striped Hyena, Muntjac, Wild Boar, Flying Squirrel, Porcupine, Pangolin, and crocodiles.

The commonly found reptiles in the study area are Monitor Lizard, Indian Chameleon, Common Krait, Indian Rock Python, Cobra, Russell's Viper etc.

The species of avifauna include partridges, cattle egret, pond heron, babblers, parrots and parakeets, blue jay, wagtails, quails (both black and grey varieties), Bulbul, Koel, Fly catchers, Woodpeckers, Sun bird and Weaver bird.

As per the assessment, a total of 30 species of mammals, 21 species of reptiles-amphibians and 96 species of birds are reported from the project study area.

1.7.3 Social Environment

Census Profile

The Project corridor area comprises of 23 villages of Korba, Raigarh and Jashpur Districts. As per Census of India 2011, the total population of the study area is 210518 in which 104855 (49.81%) are males and 105663 (50.19%) are females. An average gender ratio of the study area is 1078, which shows that the composition of male and female is balanced. 14.11% of population belongs to 0-6 age group. Average literacy rate of the study area is approximately 52.96%, of which male literacy is 62.07% while female literacy rate is 43.92%. The composition of Schedule Caste (SC) in total population is 9.23% and Schedule Tribe (ST) is 65.97%.

Work Participation Rate of the study area is 56.56% in which males are 60.90% and females are 52.25%, creating a gender gap of 8.65%. Among the total workers 71.59% are main workers and rest 28.41% are marginal worker.

A total of 108 numbers of project affected families (PAFs) among the categories of titleholders (land and structures losers), squatters, and tenants (non-titleholders) and a total of 671 project affected persons with 337 (50.22%) males and 334 (49.78%) females are likely to be affected due to the Project.

Out of the total 108 PAFs, 48 (44.44%) belong to General caste, 13 (12.04%) are OBC, 3 (2.78%) and 44 (40.47%) are ST.

There are no identified archaeological structures within the Project study area.

1.8 Analysis of Alternatives

Detailed analyses of the alternatives have been conducted considering both with and without project scenarios. The proposed development of greenfield highway is likely to have a positive







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impact on the economic value of the region. However, there are certain environment and social issue, these needs to be mitigated for sustainable development.

Three alternative options were studied for the proposed project and the Option 1 was found out to be most the suitable as the forest area diversion for the Project is less in Option 1, there is no Sensitive Feature within the required RoW further, the Option 1 will impact least number of settlements.

1.9 Public Interactions & Consultation

Public Interactions and 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.

1.10 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 endeavor 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.

1.10.1 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.

1.10.2 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.

1.10.3 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







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be provided along the major canals and pond. Oil interceptors are proposed near fuel handling areas.

1.10.4 Impact on Ecology

Nearly 1,44000 number of trees in forest are likely to be felled due to the proposed development which will cause 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 forests declared as protected forests and reserve forest and 182.4202 ha. diversion of forest land is required.

1.10.5 Impact on Land

During the construction of the proposed project, the topography will change due to cuts and 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.

1.10.6 Social Impacts

The Project is a greenfield requiring a total of 707.541 Ha of land is to be acquired for the Project. Out of total 707.541 Ha of land, 2.29 Ha of land is available with NHAI, 162.330 Ha of Government land will be transferred, and 542.921 Ha of private land will be acquired. In total, 23 villages will be affected due to land acquisition.

1.10.7 Impact on Properties

Nearly 110 structures, including 106 private structures, will be affected due to the proposed Project Road. As per the survey, total 108 household comprising of 671 people will be affected due to the Project.

1.11 Mitigation Avoidance and 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 towards 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 will also provide environmental enhancement measures to improve aesthetics and shade in the Project area. The planned environmental enhancement measures will include avenue plantation in available clear space within RoW, enhancement of water bodies etc. In order to avoid contamination of water bodies during construction Silt Fencing and Oil Interceptors at storage areas and at construction yard have been proposed. The affected households shall be compensated as per the entitlement matrix prepared according to Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013.







1.12 Institutional Requirements and 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 NHAI 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 Monitoring

Regular monitoring of important and crucial environmental parameters is of immense importance to assess the status of environment during operation of the proposed project. With the knowledge of baseline conditions, the monitoring program can serve as an indicator for any deterioration in environmental conditions due to operation of the Project and suitable mitigating steps could be taken in time to safeguard the environment. Monitoring is as important as that of control of pollution since the efficacy of control measures can only be determined by monitoring.

1.14 Project Benefits

The benefits of the Project are multi-fold. The Project will substantially benefit the commuters travelling between Urga and Pathalgaon. The current route between Urga and Pathalgaon measures about 106 km which shall be reduced to 87.545 km i.e., 17.5% reduction.

In addition to the improved connectivity, proposed development is expected to generate direct employment for about 1500 persons both skilled and unskilled labour during construction phase the Project and considerable indirect employment opportunities in form of transportation of construction materials, greenbelt development, ancillary facilities like canteens, community kitchens etc.

1.15 Environment 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 Environment Impact and Management Matrix provided in **Table** below.

Table 0-1: Environment Impact and Management Matrix

Particulars	Stages	Potential Impacts	Mitigation Measures
Physiographic Environment			
Topography	Preconstruction and Construction	 Slight changes are expected due to development of the road Impacts are marginal, but permanent. 	minimum .







Particulars	Stages	Potential Impacts	Mitigation Measures
Geology	Preconstruction and Construction	 Impacts are moderate because of extraction of sand 	-
Climate			
Temperature / Rain fall / Humidity	Preconstruction and Construction	 Tree felling will have an impact of microclimate of the area Heat island effect due to increase in paved roads Low spatially restricted short-term impact 	 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 smoothened
Land			
Loss of Other Land	Design, Preconstruction and Construction	Loss of Property and Livelihood	• Compensation as per LARR, 2013
Induced Development	Preconstruction and Construction	 Insignificant change in the land use pattern 	 Civil authorities to plan and guide any induced development under regulatory framework
Soil			
Soil Erosion	Preconstruction, Construction and Operation	In Road slopes and spoilsErosion in excavated areas	 Embankment protection through pitching and turfing Regular water sprinkling in excavated areas
Contamination of Soil	Preconstruction, Construction and Operation	 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 	 Hazardous and Other Wastes (Management and Transboundary 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			





Particulars	Stages	Potential Impacts	Mitigation Measures
Impact on Water Resource	Design, Preconstruction, Construction and Operation	fuel and lubricants	 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 Transboundary Movement) Rules, 2016 Both side drain facility to suitably divert the run-off from roads.
Air		T	
Dust generation	Preconstruction and Construction	 Shifting of utilities, removal of trees and vegetation, transportation of material 	Hot mix plant to be installed in down wind direction with at
Gaseous pollutants	Preconstruction, Construction and Operation	plant and vehicle operation for material transportation	 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	Air pollution from trafficCO level is likely to increase	Compliance with statuary regulatory requirements
Noise			
Pre- Construction Activity	Pre-Construction	 Man, material and machinery movements Establishment of labour camps, onsite offices, stock yards 	 No Horn Zone sign, Speed Barriers near sensitive receptors Camps will be setup more than 1000m away from settlements.





Particulars	Stages	Potential Impacts	Mitigation Measures
		and construction plants	
Construction Activity	Construction	 Operation of high noise equipment like hot mix plant, diesel generators etc. Community residing near to the work zones. 	 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	 Indiscriminate blowing of horn near sensitive area 	Restriction on use of hornsNo Horn Zone sign.
Ecology			
Flora	Preconstruction, Construction	Loss of vegetation coverFelling of 25000 nos. of trees	 Felling of only unavoidable trees Compensatory Plantation in the ratio of 1:10
Fauna	Preconstruction, Construction and Operation	 Loss of insect, avian and small mammalian species due to felling of trees Impact on Dolphin and Gharials present in Beas River Conservation Reserve Accidental run over 	 Compensatory Plantation Speed breaker, Signage and limit in sensitive areas Construction of Cable Stayed Bridge over Beas River
Social		Γ	
Socio Environment	Design, Preconstruction and Construction	Loss of Property and LivelihoodLoss of CPRs, Religious Structures	 Compensation as per LARR, 2013 Relocation of CPRs, Religious Structures to suitable place
Public Health an	d Road Safety	Т	
Health and safety	 Preconstruction, Construction and Operation 	 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 	 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



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Particulars	Stages	Potential Impacts	Mitigation Measures
			 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.

The total cost of EMP is estimated to be nearly **INR 65.884** crore.

1.16 Conclusion

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.

