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ENVIRONMENT IMPACT ASSESSMENT STUDY OF HIGHWAY NH-3 GWALIOR TO SHIVPURI

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Abstract: *The Environmental Impact Assessment is a process of environmental changes of both high quality and negative affects at the physical, organic socioeconomic, that will be caused or generated due to a planned task EIA provided a plan to lowering the dangerous environmental impact of proposed development assignment via alternative strategies, layout exchange and remedial measures. Highway construction is a main action of financial improvement international locations. Road development is principal supply of harm to the environment, consisting of ecological destabilization, habitat interruption and damage to plant life and fauna. In this study, surroundings influences are analyzed the study focused at the environmental impact assessment of the assignment in the light of the existing situation at the site. The parameters covered in study are socio-financial, natural, air, dust, water, and noise, accidental, ecological and soil, pattern of air, soil and water were taken to research their present condition. An try has been made on this study environmental effect of highways construction project the use of tick list analysis method. In this study entails construction of GWALIOR- SHIVPURI highway (NH-3) within the country of Madhya Pradesh taken for investigation of EIA on surroundings.*

Keywords: *Method Environmental Impact Assessment, Highway Construction, Checklist*

INTRODUCTION

The EIA observe is essential to arrange a detailed account of environmental impact of the proposed activity so that suitable involvements could be taken. An effort has been made in this study to optimize environmental impact of highway construction project using checklist analysis methodology. The study based on different factors such as total area, parking region, rainwater harvesting arrangement, basement area, sewage treatment plant, water quality, solid waste, source of water, depth of ground water, distance from the city, nearest sensitive zones and overall settlement density. The arrangement search for define the assignment in a holistic manner and suggest possible mitigation measures for development. The study discussed that through early planning before the start of the project as well as through all phases of the assignments development, if environmental concern are measured concurrently with additional technological and financial criterion, it might be probable to build up the housing projects with the defense of natural resources of that area. Road development is very important for the socio-economic improvement of any area. Development of industry, mining forestry, agriculture, trade and tourism etc. depends to a large extent on the existence of efficient transport network. In order to increase the efficiency of transportation system new roads are being constructed and existing roads being improved.

Environmental Impact Assessment (EIA)

Environmental effect is a way utilized for assessment making related assignments, developments and Programmes along with incinerators, airport runway, pig rearing and peat extraction. EIA is intended to discover the Environmental, Social and Economic influences of a proposed improvement prior to decision-making. This way that it is simple to recognize:

- The maximum environmentally suitable option at an early level
- The fine plausible environmental choice
- Alternative methods

Study area

Study consist four lane of NH-3 among Gwalior to Shivpuri for a design length of 125+300 Kms, Under NHDP Phase –IV. The Project based on building of four lane road from Gwalior to Shivpuri of division NH-3 from Km.15+600 (NH-75) to km.236+000 (NH-3). The plan road extend is a part of Agra-Gwalior-Shivpuri-Indore-Mumbai highway Major constructed up area alongside the improvement extend are Gwalior, Ghatigaon, Mohana, Shivpuri. The proposed improvement follows

the 5.65 km of rearrangement, 36.900 km of 3 NOS By-passes & 82.750km of presented placement. The road commonly passes thru plain & rolling terrain & additionally passes through Forest place SON BIRD Sanctuary & Madhav National Park, Land use along the street is of mixed nature with presence of agricultural, forest, vacant land & interspersed built up region.

BYPASS & REALIGNMENT PROPOSALS

The current existing arrangement of NH-3 passes from various villages/ cities where the existing road to be converted into narrower and there is a no area for similarly enhancement. To decrease the demolition of developed structures, to short out the difficulty of traffic jamming, optional routes were proposed in terms of bypasses to divert the traffic from urban areas.

Growth of Pre-Construction Activities:

The preconstruction activities like mobilization of flora and equipments, construction of camps, creation of laboratories, erection, and commissioning of vegetation have been finished. Marking of centerline, erections of GPS pillars, benchmarks also are completed based totally on the topographic survey.

The Design Consultant has finished independently/ at the same time with the EPC Contractor the pre-design survey works and inventories of highways and systems. Bore whole drilling for sub soil research for minor bridges and fundamental bridges and ROB has been finished.

Progress of Physical Construction Activities

The Contractor has divided the project road in to three sections for the purpose of construction management is described below.

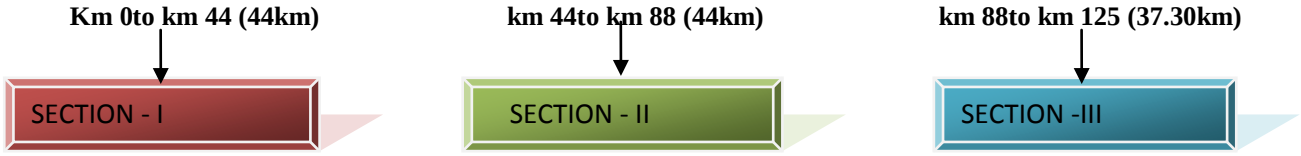

Table 1: Progress of Highway

Sr. No.	Description	Unit	Total Scope	Achieved			
				Up to Feb -14	In March -14	Total Up to Date Qty.	Achieved %
1	Tree Cutting	km	125.30	0	0	0	0
2	Clearing and Grubbing	Km	125.300	24.90	0	24.90	19.87
3	Embankment	Km	125.300	0	0	0	0
4	Sub grade	Km	125.300	0	0	0	0
5	GSB	Km	125.300	0	3.50	3.50	2.79
6	WMM	Km	125.300	0	3.50	3.50	2.79
7	DBM	Km	125.300	0	0	0	0
8	BC	Km	125.300	0	0	0	0
9	Road Furniture	km	125.300	0	0	0	0

Financial Progress

The attained financial cumulative progress is 17.85% alongside the cumulative targeted improvement of 25.45 % as per the financial program.

- **Materials**

Construction substances like aggregates, fine aggregates, GSB supplies are being produced by stone grinder situated on the Mohana & Kheria city in Gwalior division. Substances are being examined in Contractors Laboratory.

Production and stocking of aggregates, procurement of all other construction materials are in development. The inventory details of materials are in defined in table 4.

Table 2: Stock Details of Materials

SR. No.	ITEMS	UNIT	SCOPE	Cumulative QTY Procured up to Feb.-14	QTY procured during month of March-14	Cumulative QTY procured up to March - 14	%
1	AGGREGATES	MT	2855500	1787847	110220	1898067	66.47%
2	STEEL	MT	17187	-		-	-
3	BITUMEN	MT	55000	-		-	-
4	CEMENT	MT	136000	-		-	-
5	GSB	MT	1560000	635860	-	635860	40.76%
7	RCC Hume pipe						
(a)	1200mm Dia	No.	570	248	-	248	43.50%
(b)	1000mm Dia	No.	820	500	-	500	60.97%
(c)	600mm Dia	No.	2250	695	-	695	30.88%

Mobilization of Plant and Equipment

EPC Contractor has assembled good number of plants and apparatus at project location to execute the building actions.

Testing of Materials

The EPC Contractor has acquired greater part of Lab equipments essential for soil, GSB, WMM, Bitumen, aggregate and concrete analysis. The inventory of Lab apparatus procured is. GSB material, soil tests from borrow regions, aggregates, cement and bitumen are being examined often on the site laboratory. Trial mix design for concrete with various admixtures is also being done in the working lab.

- **Testing and Approval of Plants and Equipments**

All plants and equipments used for testing, and production of materials confirms necessities of the measurement and quality assertion method.

- **Crushed Stone Aggregates**

Samples of aggregate from source Mohana & Kheria were tested at Contractor's Lab. The test consequences had been communicated to the EPC Contractors for taking remedial measures conform to desired requirements and specification, before incorporating in works. Aggregates acquired at base camp are being tested in laboratory on daily basis.

- **Borrow Areas (Soil)**

33 Nos. Borrow region had been selected. Soil sample of all borrow vicinity have been tested in laboratory and located conforming to specifications.

- **Concrete Designs Mix**

Mix designs of Concrete M15 and M20 grades for PCC, M20 to M35 grades for RCC and M35 grade for Bored loads are being carried out.

- **Granular Sub Base**

Samples composed mutually through concessionaire & EPC Contractor and getting examined in contractor's Lab. Test effects were communicated to the EPC Contractors for requisite motion. Frequency assessments are being executed and information are maintained..

- **Wet Mix Macadam**
  The mix layout of WMM from grinder basis are being achieved mutually via Concessionaire & EPC Contractor and facts are maintained..
- **Dense Bitumen Macadam**
  The mix layout of WMM from grinder basis are being achieved mutually via Concessionaire & EPC service provider and facts are maintained..

Source Approval of Materials
The subsequent basis of supplies have been accepted by Concessionaire

- **Cement:-**
  Sample material tested at EPC contractor's lab & results are found confirming to specifications. & have to be submitted for third party testing.
- **Admixtures:-**
  Test material analyzed at EPC contractor's lab & consequences are establish confirming to conditions. & have to be submitted for third party optimization.
- **Steel:-**
  Sample material tested at EPC contractor's lab & results are found confirming to specifications. & have to be submitted for third party testing.
- **Bitumen:-**
  Test material analyzed at EPC contractor's lab & consequences are establish confirming to specifications. & have to be submitted for third party optimizing.

Table 3: Source Approval of Materials

Sr. No	Material	Source
1	Coarse Aggregate	Mohana & Kheria
2	Fine Aggregate	Mohana & Kheria
3	GSB	Mohana & Kheria
4	Stone Dust	Mohana & Kheria
5	Steel	TATA Tiscon Fe500 D SAIL Fe500D RINL TMT JSPL TMT
6	Admixture	-
7	Cement	Jaypee & Vikram Premium, ACC (OPC 43), Shree Ultra(OPC 43), Ultra Tech(OPC 43) & Ambuja OPC 43 Grade
8	Bitumen (VG-30)	-
9	Emulsion (RS-1 & SS1)	-
10	Curing Compound	-
11	Water	Bore Well Mohana Camp Bore Well Kheria Camp

Plant, Equipment and Machinery
The contractor has mobilized sufficient number of plants equipments and machineries at site/camp for the construction activities.

Status of Land Acquisition

As per the dispensation contract, the project requires a Right of Way (ROW) of 60.0 metres. Accordingly, the Status of Land availability as on April 30, 2014 is summarized in the table below. The current status tabulated below shows, that out of a total of 745 Ha, the land available for work is over 629 Ha (Approx. 84%). The balance land area not currently existing for the assignment comprises about 80 Ha of Forest and 16 Ha of wildlife authority land. However out of 80Ha forest land, NHAI has received level and acclaim for 64.25 Ha. This is an in principle approval where by the forest authorities have prima facie reviewed & accepted the proposal.

Table 4: Status of Land Acquisition

Sr. No.	Description	Land Acquisition Area in Ha.	Land available for work in Ha.	Land Not Cleared/ Encumbrance in Ha.	Remarks
1	Private Land Vested with Central Govt. as per 3a Notifications	263.776	256.011	7.765	3D under process
2	Clear land of Existing Road Carriageway available	238.06	238.060	-	-
3	Reserve /Protected forest formal approval from MOEF	80.289		80.289	Stage-I approval acquired(64. 259)
4	Reserve/ Protected forest (Not Requiring Diversion of Land	-	0	-	-
5	Govt. land to be transferred	147.379	135.008	12.371	3D under process
6	Wild life land	15.540	-	15.540	-
	Total %	745.044 100%	629.079 84.43%	115.965 6.94%	

Status of Removal of Encumbrances

To proceed with the project construction, several utilities are required to be shifted under the supervision of the respective authorities. These include a water supply line, hand pumps, besides Electrical lines, as shown in the table 7 below.

Electrical Shifting

Estimate - (1) Gwalior = 6.72 cr. Pending for NHAI approval
(2) Shivpuri = 7.58 cr.Pending for NHAI approval

Table 5: Status of Removal of Encumbrances

Sr.No	Authority	Description	Unit	Total Scope	Work Done	Balance
1	MPMKVV	HT line	Km	34.40	Nil	34.40
2	MPMKVV	LT line	km	4.65	Nil	4.65
3	MPMKVV	33kva line	Km	6.10	Nil	6.10
4	MPPHE	Water supply line	Km	0.800	Nil	0.800
5	MPPHE	Hand pump & Tube well	No	90	Nil	90

PHE Shifting

Table 6: PHE Shifting

S. No.	Dist.	Estimate	Work done	Balance	Remark
1	Gwalior	23.74 lakh	0	23.74 lakh	
2	Shivpuri	26.78 lakh	In progress		To be executed by Department

Estimates for transferring of the above Electric lines have been organized. The envisioned price is about Rs. 6.73crores under the Gwalior division and Rs 7.60 crores for works underneath the Shivpuri division of MP MKVV. The present estimation are depends on the 2012 SOR and the similar is being modified based on the SOR for the year 2014. Estimates had been accomplished for the transferring of the water supply pipeline & related objects explained above. The PHE branch of the Shivpuri division has finished the affecting of all the 17 NOS hand pumps. For the Gwalior department, the shifting of 18 nos. hand-pumps have been finished, beyond a total of 26 NOS, and the left behind are in progress.

R&R Activities

The following structures coming within the ROW already handed over to the Concessionaire are being demolished after resolving the related rehabilitation and payment issues.

Table 7: Status of R&R Activities

Particulars	Total
Total No. of Temples/Mazaar	22
Total Nos. Shifted	0
Balance	22

Tree Cutting

Table 8: Status of R&R Activities

Particulars	Unit	Total	Permission obtained
Total No. of Temples/Mazaar	No	17700	4599
Total Nos.Shifted	No	600	0
Balance	No	1700	0

The Concessionaire has initiated the process for payment of deposit to the Tree Authority to cut the trees coming within the ROW. The trees for which cutting has not commenced are lying within the forest and wildlife land, for which the Stage II approval is still awaited. A detailed list of obstructions and encumbrances has been prepared and these are being removed progressively in the areas already handed over.

CONCLUSION

It is understandable that the environmental effects of projects and policies are no longer considered as inconsequential or secondary to decision-making for improvement. EIA is now recognized as an essential element of the assignment series, and donor-funded transportation projects will continually need that environmental problems are correctly addressed the use of this or a associated method. The identification at the beginning stage of environmental effects supply not only to project assessment, but also project design, which incorporates necessary mitigation. Equally important, as component of the EIA process, is the development of an Environmental managing arrangement by which the project implementation can be tracked against planned benchmarks and expectations, with appropriate design changes being considered where warranted. Donor project evaluations now include an examination of the environmental outcomes, and compare actual performance with plans. In this context, not only must the planning for environmental impacts be robust, but the proposed countermeasures must be soundly conceived and properly affected. As with any such development, this requires the identification and commitment of resources for the project life-span. In developing economies, these resources may be difficult to sustain, given that they are not obviously 'productively' used (in the sense of providing a clear and measurable return on investment). However, the

evidence of environmental damage caused by such short-sighted approaches is now too overwhelming to be ignored. Clearly, EIA's should be supplied for from the outset in the price range of all road tasks, and environmental evaluation assessments units in highway construction agencies of developing countries encouraged as well known practice.

REFERENCES

1) Amit Bijon Dutta "Environmental Impact Assessment (EIA) and Construction" International Research Journal of Environment Sciences Vol. 3(1), 58-61, January , 2014, ISSN 2319–1414
2) B.A Dutta, and Sengupta. I, Environmental Impact Assessment (EIA) and Construction International Research Journal of Environment Science, (2014), 58-61.
3) Chris Frid "The environmental interactions of tidal and wave energy generation devices" Environmental Impact Assessment Review journal, Elsevier, 2012.
4) Ciaran O' Faircheallaigh "Public participation and environmental impact assessment: Purposes, implications, and lessons for public policy making" Environmental Impact Assessment Review journal, Elsevier, 2010.
5) Farhad Samimi Namin "New Model for Environmental Impact Assessment of Tunneling Projects" Journal of Environmental Protection, 2014, 5, 530-550 Published Online May 2014.
6) Farhad Samimi Namin, Hamid Ghafari, Ali Dianati,"New Model for Environmental Impact Assessment of Tunneling Projects", Journal of Environmental Protection, 2014.
7) Ganeshkumar B., Gobinath, Prabhakaran N. and Rajeshkumar K., Modified EIA for small and medium projects – An effective method to make the projects Eco friendly, International Journal of Environmental Sciences, 2010.
8) K Dutta, and S. Bandopadhyay S, Environmental Impact Assessment and Social Impact Assessment – Decision Making Tools for Project Appraisal in India. International Journal of Human and Social Sciences, 5, 6 (2010).
9) Lihua Feng "Assessment on Environmental Impact of Building Tidal Gate on Yongjiang River" 978-1-4244-5326-9/10/$26.00, IEEE , 2010,
10) M. Young, the Technical Writer's Handbook. Mill Valley, CA: University Science, 1989.
11) Martina Zeleňáková "Risk analysis within environmental impact assessment of proposed construction activity" Environmental Impact Assessment Review journal , 2017.
12) Mhaskar Z., Environmental Impacts of Construction Activity & Site Control Practices, Ecohousing India, 2005**.**
13) Nicola Hartley "Public participation in environmental impact assessment—implementing the Aarhus Convention" Environmental Impact Assessment Review 25 ,2005, 319–340
14) P. Fouracre "Environmental Impact Assessment and Management" Rural Travel and Transport Program, 2001
15) Pacifica F. Achieng Ogola "Environmental Impact Assessment General Procedures" Presented at Short Course II on Surface Exploration for Geothermal Resources, organized by UNU-GTP and KenGen, at Lake Naivasha, Kenya, 2-17 November, 2007.

