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Construction of the Kundli-Manesar-Palwal Expressway in Context of Environmental Considerations and Planning and Design Stages: A Review Study

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ABSTRACT: The most important details in this text are that alternative arrangements will be made for the relocation of high-tension wires and public utilities, and that every possible measure will be taken to reduce the number of trees cut down to the barest essential number possible. Additionally, the Forest Act of 1980 mandates that tree seedlings must be planted in every open area that is easily accessible. Additionally, heavy equipment and stockyards will be placed on the degraded area to limit oil and grease pollution of the environment. This park and bird sanctuary is located in the Gurgaon region, approximately 50 kilometres from Delhi, 15 kilometres from Gurgaon on the Gurgaon-Farukh Nagar Road, and 2.3 kilometres (south-east) from the project area. The most important details in this text are that it is important to site labour camps away from forest areas to avoid encroachment on forest land and the resultant loss of forest products, and that the environmental requirements at borrow sites, quarries, plant sites, and construction sites must be met in accordance with the Environmental Management Plan. It is also necessary to include project design considerations such as protection measures, erosion management, noise barriers, a rainwater collection structure, and an upgrade strategy. It is reasonable to assume that the undertaking will have significant positive repercussions for the environment, the economy, society, and the country as a whole, and that these effects may be avoided. If the aforementioned strategy is taken into account during the design and execution of all of the aforementioned components while the road is being built, the project will be environmentally viable throughout the course of its lifetime. It is estimated that the Kundli-Manesar-Palwal Expressway building project would span a total distance of 135.65 kilometers in its entirety. As soon as the environmental clearance was obtained, building immediately began, and during the time that the EC is still in effect, around 68 percent of the groundwork has been completed. It is expected that the project will be finished before to the end of the year 2018, which will be in 2019. The section of the expressway that is 52.33 kilometers long and extends from Manesar to Palwal has already been finished and opened to traffic for travel by the general public. This section of the highway spans from Manesar to Palwal. In addition, these precautions have been taken into account throughout the planning and design stages of the project as well.

KEYWORDS: Kundli-Manesar-Palwal Expressway**,** National Capital Region, HSIIDC, annual average daily traffic

I. INRODUCTION

One of the states that works closely with the National Capital Region is Haryana, as you can see below. The following goals have been defined in order to make the most of the opportunities afforded by the developed lands near vicinity to the nation's capital and to satisfy the needs of a wide variety of land users for the space that has been created: The development of infrastructure in the National Capital Region (NCR) sub-region by the state of Haryana is leading to an increase in the volume of traffic moving in and between cities on a daily basis. In the writ case (civil) 13029 of 1985, also known as M. C. Mehta vs. Union of India, the Honorable Supreme Court of India issued a ruling on December 16, 2001, and again on July 15, 2002, declaring that no heavy, medium, or light goods trucks should be permitted to drive on any interstate highway that goes through Delhi. There are a number of National Highways that travel through the city of Delhi, however there will not be a corridor or bypass linking these highways. If and when the corridor is constructed, it will be necessary for it to go through or close to Delhi. A brand-new highway connecting the towns of Kundli and Manesar in the Indian state of Haryana has been developed as a direct consequence of the judgements that were handed down by the Honourable Supreme Court of India [1]. In light of these circumstances, the government of Haryana has proposed, via the Haryana State Industrial and Infrastructure Development Corporation (HSIIDC), the building of an expressway that would connect the highways that were described before while bypassing the city of Delhi [2].

Project Description

The path that the construction crew would take for the project will take them through a total of five distinct districts, including Sonipat, Jhajjar, Gurgaon, Mewat, and Palwal, amongst others. HSIIDC has already acquired ownership of a

stretch of road property that extends for a distance of one hundred metres besides the proposed route of the expressway. It will not be possible for cars travelling at a slow speed to go through the work zone on the highway.
It is suggested that the highway pass over a number of seasonal streams, irrigation canals, distributaries, and nallahs, crossing them with large and small bridges. Out of the total length of 135.650 km of highway, about 132 km has been planned as a full embankment.

It has been estimated that the total cost of the project throughout its whole would come to around 3340.81 crores. This figure takes into account the 1020 crores that have already been spent on the construction of the roads. It has been determined that Rs 24.64 crore has to be spent on maintaining one km of road. This figure represents the unit cost. There are going to be certain portions of the proposed road that run through forest area, and this is going to add to the influence that it has on the ecosystem. There is an area of forestland of around 35.63 hectares that is involved, and the appropriate approvals have been received in advance from the Ministry of the Environment and Forests.

The initiative will have many positive outcomes in the long run. It will make it possible to create an all-weather high-speed access-controlled roadway, which would alleviate congestion on the existing road network caused by the increasing amount of traffic. This would be a significant benefit. In addition to these benefits, this expressway will also provide others, including [4]:

As a result of the increased speed and reliability of communication, people will spend less money on fuel, trip time, and overall transportation expenditures.

People have the opportunity to get employment.

a growth of agriculture, industry, and the arts and crafts in the surrounding communities

Travel for both pleasure and religious observance is enjoying a surge in popularity.

Agricultural product shipping and processing, as well as retail sales, are all included in the job description for this position.

The number of reported accidents has gone down recently.

The amount of pollution is now being cut down.

The emergence of new jobs as a result of the opening up of possibilities.

A more all-encompassing method of providing medical and educational services, as well as a more expedient method of transporting perishable goods such as fruits, vegetables, and dairy products

People's quality of life will be improved, among other things.

Because the project will be beneficial to all of the demographic groups, it will not have an effect that is unfavorable to any of those groups as a consequence of its implementation. This section of the publication contains the executive summary that was derived from the environmental impact assessment study that was performed on the project.

Need For the Environmental Impact Assessment

If an EIA Authority is not constituted, it will be essential to get authorisation from the Ministry of Environment and Forests in New Delhi. The EIA Notification, which was last revised in September 2006, states that the proposed endeavour is classified as being within the B category. Because Uttar Pradesh has formed a State Level Environmental Impact Assessment Authority, the state government's blessing is required before the construction of the proposed project can begin [5].
Before attempting to get Environmental Clearance from the right state or federal government agencies and departments, it is important to first complete research for an Environmental Impact Assessment, often known as an EIA. The Environmental Impact Assessment (EIA) investigates potential avenues for enhancing the environmental performance of a project via the reduction or elimination of unfavourable effects. The design of the roadway is now being modified to take into account the findings of the EIA investigation.

II. REVIEW OF LITERATURE

In order to carry products in a timely and cost-effective manner, a complete transportation system is required, and the ever-increasing volume of road traffic mandates both the enhancement of the riding quality of roads and the maintenance of constant movement. As a consequence of this, the construction of more highways becomes an absolute need. [9].

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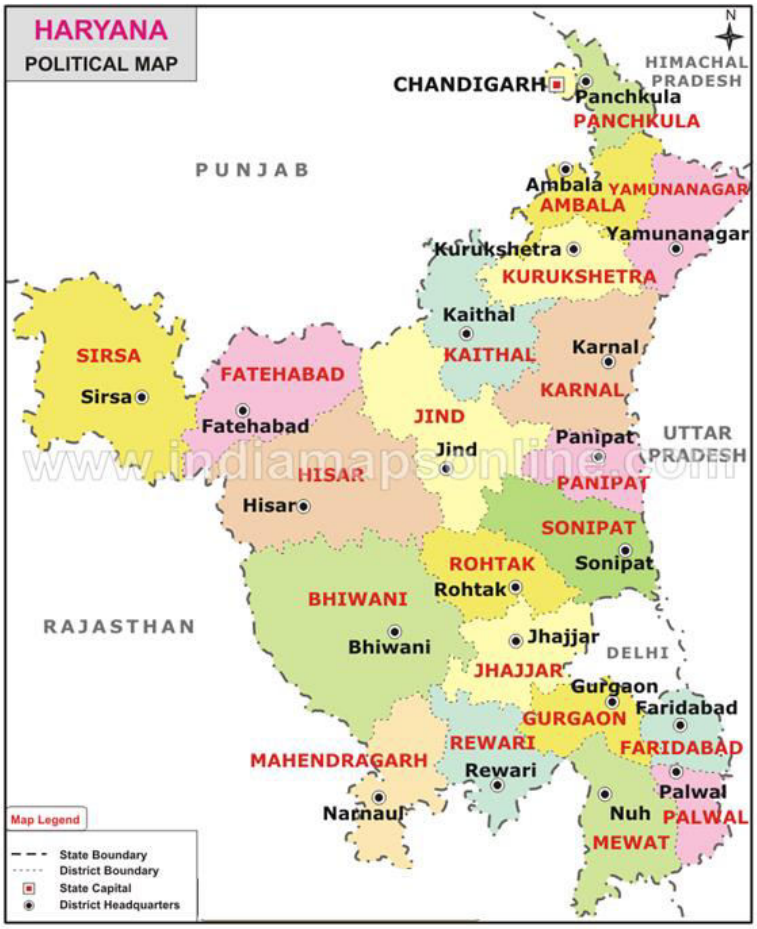

Fig. 1: Haryana Political Map

Haryana

Since the 1970s, Haryana has been one of the South Asian states that has seen the most consistent growth in both its agricultural and industrial sectors, which has helped it become one of the most economically developed regions. Since the year 2000, the state has emerged from a period of transition to become India's most successful recipient of investment on a per capita basis. It shares a border with Rajasthan to the west and south, as well as a border with The Yamuna River serves as the dividing line between Uttar Pradesh and the neighbouring state of Uttar Pradesh on the state's eastern side. Haryana creates the country's northern, western, and southern borders with the rest of the world, including Pakistan, by encircling the nation's capital, Delhi, on three sides. Delhi serves as the seat of government for India. As a direct consequence of this, a sizeable area of south Haryana has been categorised for the purposes of development planning as being located within the National Capital Region. [10].

HSIIDC entered into a contract with RITES in 2006 to finish the process of acquiring Environmental Clearance in order to successfully attain this goal. It was RITES that was responsible for producing the comprehensive project report for the project, and it was also RITES that was given the responsibility of obtaining EC, which was done in February of 2007. Sixty-eight percent of the work was finished within the time that the EC was valid, which was for a period of five years. ENV DAS India Pvt. Ltd., Lucknow, has been given the responsibility of obtaining environmental clearance (EC) for the remaining work by HSIIDC.

OTHER RELEVANT STUDIES

The results of a case study on Road Accident Analysis of Patna City that was carried out by S K Singh and Ashish Mishra (2014) indicate that encroachment and traffic congestion are the key factors contributing to the high number of road accidents that occur in the city. It was found with the help of their equation that the number of accidents rises

along with the annual average daily traffic (AADT) but falls when there is an improvement in the condition of the roads. [13].

P. Pramada Valli (2014) developed models of road accidents for India's major metropolitan centres. These models were then used to forecast the occurrence of future road accidents. The most important takeaway from the study was that in order to reduce the number of accidents, substantial rules need to be modified in order to restrict the proliferation of private vehicles and encourage citizens to use public transit instead. This was determined to be the case as the primary conclusion obtained from the research. The 178 countries included in this year's Global Status Report on Road Safety contributed information for the report. This has been achieved as a result of the proactive measures taken by the government as well as the severe application of the laws. [14].

There has been no forwards made towards a solution to the problem in any country if the government is only observing the situation from the outside. The state's economic growth is advancing at a far quicker rate than the national average, particularly when compared to the economic development of other states in India. This helps to explain why there is such a large concentration of autos on the limited number of roads that are available. According to the information that is presently available, there were about 5,763 motor vehicles situated within an area of 100 square kilometres during the years 2003 and 2004, respectively. In spite of the fact that the total number of automobiles that were registered in Haryana as of the 31st of March in 2004, was 25, 47,910, the real number of motor vehicles that were moving on the roadways inside the state was around 28, 53,667. This illustrates that Haryana receives a significant share of the through traffic that travels through the country.

Following an examination of the available statistical information, it has been determined that there were approximately 10,000 automobiles involved in collisions on the roads of various regions of the state during the fiscal year 2006-2007. The number of persons who were died in road accidents over this time period was tragically high at 4291, while the number of those who were injured was 8471. Despite the fact that there are basic laws for road safety in India, the article illustrates that their enforcement is very slack, which is a major concern. A grade of 2 out of 10 was given to the requirement that passengers in cars wear seat belts at all times. Over the past few years, the number of people who have been killed or injured in road accidents in India has been increasing at a rate of approximately 8 percent per year, and this trend does not appear to be abating any time soon. As a result of this, it has been proposed that India's regulations regarding road safety should be made more comprehensive, while at the same time, enforcement should be strengthened. [16].

When it comes to the amount of money spent on medical care, India is ranked 86th out of 190 nations; the country's government allocates just 7% of GDP to this category of expenditures. It is essential for the government of India to enact laws that would promote road safety in order for there to be an improvement in road safety in India. Unfortunately, India has one of the worst records when compared to other countries in terms of the safety of its roads.

Road traffic accidents are responsible for the deaths of more than 120000 persons and the injuries of around 130000 people each and every year in India. From 2010 to 2014, there was a substantial rise of 6% in the number of accidents that occurred on the roads. [18].

On the other hand, many who specialise in road safety feel that the actual number of incidents is likely to be higher given that a large percentage of collisions are not recorded. According to the data, one person loses their life on an Indian road every six minutes; however, this number is anticipated to climb to one person dying on an Indian road every three minutes by the year 2020 if the current conditions remain unchanged. This suggests that even this figure may be an underestimate. In less populated locations, a significant number of deaths caused by automobile accidents go unreported. [19].

The World Health Organisation ranked motor vehicle collisions as the tenth largest cause of death in 2013. Roughly ten percent of all deaths that occur on the world's roadways can be attributed to India. India is responsible for nine percent of all deaths that occur due to traffic accidents, despite the fact that it only possesses one percent of the world's registered motor vehicles. More than eighty-five percent of the people who were killed in these incidents were males between the ages of 20 and fifty. [20] The great majority of people in this category make a living for their families via paid employment.

a chequered past in terms of the number of people killed in car accidents relative to the number of vehicles on the road. It was determined that Arunachal Pradesh had the highest rate, coming in at 5.7 percent, followed by Sikkim, which had the lowest percentage, coming in at 3.6 percent. The state of Nagaland had the highest incidence of accidents (92.1 percent), followed by the state of Mizoram (90.7 percent), both of which were higher than the national average of 28.4 percent. The research that was performed by the M0RTH Report (2010-2015) indicated that minor states in India had a national average of 28.4 percent. This information comes from the Indian government.

When a person is killed or seriously injured as a consequence of a car accident, it places a considerable strain not just on the family's finances but also on the social fabric of the community as a whole. The family has not only lost their loved ones, but they have also lost their means of financial support. Finding a new way to bring in money is an endeavour that is not only challenging but also unexpected and laden with peril. The wider repercussions of this include children leaving school to look for work and senior citizens being coerced into doing menial jobs. Also included in this category is the possibility of a rise in child labour. Disabilities of the body have repercussions not just for the individual

but also for society. For instance, a patient who sustains a damage to their spinal cord is left with a lifelong disability that requires them to use a wheelchair for the rest of their lives. The circumstances of the family are, in many respects, equal to, or even worse than, those of the person who was tragically injured. [22].

III. METHODOLOGY &PROJECT DESCRIPTION

The Environmental Impact Assessment (EIA) study is primarily comprised of the establishment of the current environmental scenario, the study of particular activities associated with the project, and the evaluation of probable environmental impacts, which ultimately results in the recommendation of necessary environmental control measures for the project. The whole EIA study has been carried out within the present legislative, legal, and administrative framework, taking into consideration all applicable environmental laws, rules, and guidelines published by all regulatory agencies and taken into consideration by all regulatory authorities. This has been done so in order to ensure that the research adheres to all applicable environmental laws, rules, and guidelines.

Reconnaissance Survey

To determine the current environmental situation, a detailed reconnaissance survey has been carried out on the field to gather information.

Collection of Secondary Data

The collection of secondary data is an essential part of the Environmental Impact Assessment (EIA) study. It involves gathering and reviewing existing information and data related to the physical, biological, and social environment of the project area. This information is used to identify potential environmental impacts and develop appropriate mitigation measures.

The secondary data collection process includes identifying relevant sources of data such as published literature, government reports, and other relevant documents. This data is then reviewed and analyzed to provide an overview of the environmental conditions in the project area.

The information gathered during the secondary data collection process is used to guide the field studies and surveys that are conducted during the EIA study. The data collected from field studies is then combined with the secondary data to develop a comprehensive understanding of the potential environmental impacts of the project.

In summary, the collection of secondary data is an important part of the EIA study as it provides valuable information that is used to identify potential environmental impacts and develop appropriate mitigation measures.

Field Observation for Generation of Primary Data

Field observation for the generation of primary data is a crucial aspect of the Environmental Impact Assessment (EIA) study. It involves conducting site visits to the project area to collect data on the physical, biological, and social environment.

During field observation, the EIA team examines the project area, identifies potential environmental impacts, and evaluates the effectiveness of proposed mitigation measures. This data is then used to develop a comprehensive understanding of the environmental impacts of the project and to develop appropriate mitigation measures.

The primary data collected through field observation includes information on the project area's topography, geology, hydrology, flora and fauna, land use, and cultural heritage. The data is collected through various techniques, including visual observations, measurements, and sampling.

The collected data is then analyzed and evaluated to determine the potential environmental impacts of the project. This analysis includes identifying potential impacts on the ecosystem, water quality, air quality, noise levels, and cultural heritage sites.

Overall, the generation of primary data through field observation is a crucial part of the EIA study as it provides detailed information on the project area's environmental conditions and helps identify potential impacts. This data is essential in developing effective mitigation measures to minimize the project's environmental impact.

IV. CONCLUSIONS AND FUTURE SCOPE

The total distance that would be covered by the Kundli-Manesar-Palwal Expressway construction project is anticipated to be 135.65 km. The construction started right away after gaining environmental clearance, and around 68 percent of the groundwork has been finished during the period of time that the EC is still valid. It is anticipated that the project would be completed before the year 2018 comes to a close. The stretch of the expressway that runs from Manesar to Palwal, which is 52.33 kilometres long, has already been completed and opened to traffic for travel by the general public. Additionally, these measures have been included into the design phase of the project as well.

Major Environmental Impacts

The following are some of the steps that have been implemented for the planned project:

- Prior to the initiation of civil works (also known as construction), alternative arrangements would be made for the relocation of high-tension wires and public utilities, and this aspect of the project would be accounted for during

the planning phase of the endeavour.

- Every possible measure shall be taken to reduce the number of trees cut down to the barest essential number possible. It is essential that the afforestation programme be carried out in accordance with the requirements, and that green belts be created at a number of predetermined areas at the same time that road construction is taking place. In order to compensate for the loss of vegetation that has occurred as a direct consequence of the Forest Act, the Forest Act of 1980 mandates that tree seedlings must be planted in every open area that is easily accessible.
- Along the alignment, there have been no reports of rare or endangered plant or animal species. This park and bird sanctuary is located in the Gurgaon region, approximately 50 kilometres from Delhi, 15 kilometres from Gurgaon on the Gurgaon-Farukh Nagar Road, and 2.3 kilometres (south-east) from the project area.
- Heavy equipment and stockyards will be placed on the degraded area in order to limit oil and grease pollution of the environment.
- It is important to site the labour camps away from forest areas in order to avoid encroachment on forest land and the resultant loss of forest products.
- The location of the labour camps away from forest regions is required. In addition, the management plan need to be followed to in an appropriate manner in order to keep pollution problems under control and to minimise the amount of damage done to the environment in the surrounding area.
- It is essential that the environmental requirements at borrow sites, quarries, plant sites, and construction sites are met in accordance with the Environmental Management Plan.
- It is necessary to include project design considerations such as protection measures, erosion management, noise barriers, a rainwater collection structure, and an upgrade strategy. During the building process, it is essential that the appropriate safety precautions be taken to ensure that the project will not result in a significant clogging of the drainage system.
- As a consequence of this, it is reasonable to assume that the undertaking will, in the short term (during the day only), have significant positive repercussions for the environment, the economy, society, and the country as a whole, and that these effects may be avoided. If the aforementioned strategy is taken into account during the design and execution of all of the aforementioned components while the road is being built, the project will be environmentally viable throughout the course of its lifetime.

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