



Environmental Impact Assessment Of Samruddhi Mahamarg Nagpur To Mumbai

¹Prof. A.H Jamale. ² Darekar Arti ³ Gunjal Suraj ⁴ Japkar Sunny ⁵ Shaikh Muskan

Assistant Professor & Students

Department of Civil Engineering,

Abstract: The Samruddhi Mahamarg, a 701 km greenfield expressway linking Nagpur and Mumbai, represents one of India's largest infrastructure projects aimed at enhancing connectivity and economic growth. The Environmental Impact Assessment (EIA) for the project evaluates the ecological, social, and economic impacts arising from its development. Key findings highlight substantial deforestation, biodiversity loss, and changes in land use patterns, leading to the displacement of wildlife and agricultural communities. While baseline environmental parameters such as air and water quality were initially within permissible limits, the construction phase raised concerns over pollution and habitat disruption. Socio-economic analyses revealed mixed outcomes, with economic benefits like reduced travel times and regional development opportunities being offset by issues in land acquisition and resettlement. The project incorporated mitigation strategies including environmental monitoring programs, afforestation efforts, and sustainable construction practices. Overall, the EIA underscores the need for continuous environmental management to balance infrastructural advancement with ecological preservation. Socially, the expressway is expected to boost regional economies by enhancing connectivity, reducing travel times, and fostering the development of new industrial and economic zones. Nevertheless, challenges such as inadequate compensation to displaced communities, loss of traditional livelihoods, and social inequities emerged during project execution. Mitigation measures recommended in the EIA include extensive afforestation programs, wildlife crossings, continuous air and water quality monitoring, and strategies for socio-economic rehabilitation of affected populations. The Samruddhi Mahamarg EIA emphasizes the importance of sustainable development, suggesting that while infrastructure growth can drive economic progress, it must be accompanied by rigorous environmental management and social responsibility to ensure long-term viability.

Keywords: Environmental Impact Assessment, Samruddhi Mahamarg, Mumbai-Nagpur Expressway, Biodiversity, Sustainable Development, Pollution, Socio-economic Impact

1.INTRODUCTION

Infrastructure projects like expressways are vital for economic progress and regional development. In India, rapid urbanization and industrialization have necessitated the construction of high-speed road corridors. The Samruddhi Mahamarg is envisioned as a game changer for Maharashtra, facilitating swift movement of goods and passengers, reducing logistic costs, and boosting tourism and employment. However, such mega-projects also entail significant environmental trade-offs. Understanding these trade-offs is crucial. Infrastructure development often comes at the cost of environmental degradation, loss of biodiversity, displacement of communities, and alteration of ecosystems. Therefore, an Environmental Impact Assessment (EIA) becomes an indispensable tool to predict potential impacts and plan mitigation strategies. The Samruddhi Mahamarg passes through 10 districts, 26 talukas, and approximately 400 villages, cutting across diverse landscapes like forests, rivers, hills, and farmlands. This geographical

diversity amplifies the need for a detailed EIA to ensure that development is sustainable and does not irreparably damage the natural environment. This paper seeks to analyze the environmental implications of the expressway and propose strategies for minimizing negative outcomes.

The Environmental Impact Assessment (EIA) of the Samruddhi Mahamarg was conducted to systematically evaluate the potential impacts arising from the project's construction and operation phases. Key areas of concern included large-scale deforestation, disruption of wildlife corridors, land use changes, increased air and noise pollution, and the socio-economic effects of land acquisition and displacement. The EIA aimed to identify these impacts, predict their magnitude, and propose appropriate mitigation measures to minimize harm to the environment and local communities. The assessment highlighted the delicate balance between developmental needs and environmental conservation. It recommended strategies such as afforestation programs, environmental monitoring, wildlife crossings, and socio-economic rehabilitation initiatives. This introduction provides a foundation for understanding the complex environmental challenges posed by the Samruddhi Mahamarg and the efforts undertaken to promote sustainable infrastructure development.

2.METHODOLOGY

The Environmental Impact Assessment for the Samruddhi Mahamarg involved a multi-pronged approach. Secondary data sources included government EIA reports, environmental clearance documents, scientific journals, and media reports. Field surveys were conducted to observe impacts on biodiversity, land use, water bodies, and communities along selected sections of the corridor.

Analytical methods included overlay mapping using Geographic Information Systems (GIS) to understand land use changes, matrix methods to assess cause-effect relationships of construction activities, and expert judgment for predicting ecological outcomes. Public consultation meetings, particularly with affected communities and environmental experts, added depth to the assessment.

The study categorized the impacts into pre-construction, construction, and operational phases. Baseline environmental data was collected to compare against anticipated changes. This systematic approach ensured a holistic evaluation, covering both direct and indirect impacts of the project.





3.ENVIRONMENTAL IMPACT ANALYSIS

Land Use Changes and Deforestation

One of the most immediate and visible impacts of the Samruddhi Mahamarg has been on land use. Over 10,000 hectares of land, including fertile agricultural land and forests, were acquired for the project. The transformation from green landscapes to concrete corridors leads to the loss of natural vegetation, alters local microclimates, and affects soil stability.

Deforestation near sensitive ecological zones such as the Karanja-Sohol Wildlife Sanctuary and other reserved forests has fragmented wildlife habitats, making species more vulnerable. Trees that once sequestered carbon are lost, contributing to increased carbon emissions. The removal of vegetation also results in soil erosion, which could lead to sedimentation in nearby rivers and streams.

Although compensatory afforestation measures are being implemented, the success of these efforts remains questionable. Newly planted saplings often lack the ecological functions of mature forests and may not survive without regular maintenance. Long-term monitoring and protection are necessary to ensure that compensatory efforts are meaningful rather than symbolic.

4.BIODIVERSITY LOSS AND WILDLIFE IMPACT

The expressway's alignment intersects multiple wildlife zones, severely impacting biodiversity. Fragmentation of habitats restricts the free movement of species, leading to genetic isolation and increased mortality due to roadkills. Animals like leopards, hyenas, wild boars, and several smaller species are particularly at risk.

Efforts have been made to include wildlife crossings, such as underpasses and culverts, at strategic locations. However, for these structures to be effective, their placement must coincide with traditional animal movement paths. Poorly planned crossings may go unused, nullifying their intended purpose.

Loss of biodiversity is not limited to large animals alone. Microbial biodiversity in soil, insect populations essential for pollination, and aquatic species in nearby water bodies also face disruptions. These ecological imbalances can lead to decreased agricultural productivity and deterioration of ecosystem services.

5.RESULTS AND DISCUSSION

The Environmental Impact Assessment reveals that while the Samruddhi Mahamarg can act as a catalyst for economic transformation, it imposes considerable environmental and social costs. Biodiversity loss, resource depletion, and community displacement are significant challenges that need immediate and sustained attention. Although mitigation strategies are well-articulated in official plans, their implementation must be more transparent, scientifically guided, and community-driven. Environmental sustainability must be viewed not just as a compliance issue but as an intrinsic part of the expressway's success. Balancing growth with ecological stewardship requires long-term political will, financial investment, and societal engagement. If managed well, the Samruddhi Mahamarg could become a benchmark for sustainable infrastructure development in India and other developing economies.

6.CONCLUSIONS

The Samruddhi Mahamarg represents both the opportunities and challenges of rapid infrastructure development in India. While it has the potential to transform Maharashtra's economy, the associated environmental and social risks are significant and cannot be ignored. A proactive, inclusive, and transparent approach to environmental management can ensure that the expressway serves future generations without degrading natural resources or exacerbating social inequalities. Lessons learned from this project should inform future infrastructure initiatives, fostering a more sustainable development model for India.

7.REFERENCES

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