

Bridging Kerala: Bharatmala's Role in Unlocking Regional Growth

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DOI: 10.46609/IJSSER.2025.v10i10.001 URL: <https://doi.org/10.46609/IJSSER.2025.v10i10.001>

Received: 12 August 2025 / Accepted: 20 September 2025 / Published: 15 October 2025

ABSTRACT

The Bharatmala Pariyojana is India's important national highway construction initiative, which will significantly impact transportation infrastructure and economy of Kerala. The project enhances market access, increases tourism, and expands employment opportunities by improving road connectivity, reducing travel times, and strengthening trade routes. It is also instrumental in constructing border roads, economic corridors and national highways that facilitate the movement of individuals and goods within the state, which has historically faced geographical challenges. However, its execution in Kerala is exceedingly challenging due to the elevated population density, limited landholdings, and ecological sensitivity of the Western Ghats and coastal habitats. This article examines how Bharatmala can address Kerala's transportation challenges, promote inclusive growth, and address the risks associated with land acquisition, environmental concerns, and social opposition. The paper asserts that Bharatmala can reduce rural-urban inequities and create economic opportunities; however, its long-term success depends on integrating sustainability, equity, and community involvement into project execution.

Keywords: Bharatmala Pariyojana, regional development, infrastructure expansion, travel connectivity, national highways.

Introduction

Transport infrastructure is a cornerstone of social mobility, regional integration, and sustainable economic development. Road networks link villages, cities, markets, enterprises, and communities. They constitute the foundation of commerce and industry. Kerala has had challenges in establishing connectivity with other regions due to its distinctive landscape, characterised by an extensive coastline, verdant forests, and mountainous terrain. This has

impeded its economic growth. The government of India initiated the Bharatmala Pariyojana to address these deficiencies by developing and modernising an extensive network of roads, highways, and economic corridors nationwide. Bharatmala is an initiative aimed at enhancing the travel connectivity, economy and society of Kerala. It constitutes both an infrastructural initiative and a transformative endeavour. The project facilitates industrial growth, enhances the swift movement of goods and individuals, and fortifies linkages between urban and rural regions through road improvements. Enhanced transport networks can significantly benefit vital sectors such as tourism, agriculture, and logistics by facilitating access, broadening markets, and generating employment opportunities.

The transportation system of Kerala has historically struggled due to the state's terrain, fragmented land ownership, and environmental sensitivity. The Bharatmala Pariyojana aims to enhance connectivity and economic opportunities; nevertheless, its implementation in Kerala raises apprehensions over long-term sustainability, equity, and societal acceptance. This article inquires: how can the Bharatmala Pariyojana improve connectivity in Kerala via economic corridors, port linkages, urban decongestion efforts, the construction of new bridges and tunnels, and the promotion of tourism, while concurrently tackling persistent challenges associated with land acquisition, ecological sustainability, and community acceptance? To explore this question, the study employs a descriptive and interpretative methodology based on secondary data sources, including governmental records, scholarly research, and media accounts, analyzed within an explanatory framework. This strategy is optimal for this project due to its continual nature and the necessity to examine the existing evidence. The analysis is significant as it situates a national infrastructure program within the specific social and geographical setting of Kerala, contributing to discussions on reconciling infrastructure development with environmental conservation and inclusive growth.

1. Bharatmala Praiyojana: Towards Transformational Connectivity

The objective of the Bharatmala Pariyojana is to enhance connectivity by rehabilitating the poor road infrastructure and facilitating intra-and inter-state travel connectivity. The project aims to reduce transport and logistics costs by constructing economic corridors and restricted-access highways. National highways are the primary road network in India, playing a crucial role in trade, economic development, and inter-state transportation (MRTTH, 2023, p. 1). The Bharatmala Pariyojana was initiated as a transformative infrastructure initiative aimed at enhancing the efficiency of the roadways and logistics. The data indicated that India needs a comprehensive road network. The project aims to address persistent connectivity issues by establishing economic corridors, enhancing border and maritime links, constructing highways, and reducing total logistics expenses (MRTTH, 2023, p. 2). The objective of this project is to alleviate

congestion on existing highways, facilitate the movement of goods, and enhance the efficiency of intra-state and inter-state travel (Mahalingam, 2003, p. 2821).

For Kerala, where railway coverage is limited and waterways underutilised, Bharatmala is particularly significant. The state's dense population and rugged terrain heighten its dependence on roads for trade, tourism, and daily mobility (Mahalingam, 2003, p. 2822). Its geographical location complicates infrastructure development due to traffic congestion, land-use restrictions, and environmental concerns. The Western Ghats border one side of the state, while the Arabian Sea lies on the opposite side. The Bharatmala Pariyojana has a comprehensive plan to address these challenges. This includes building additional national highways, establishing economic corridors, improving port connectivity, developing bypass roads, and constructing bridges and tunnels to navigate difficult terrain (NHAI, 2022, pp. 6–10). The goal of the project is to improve Kerala's road infrastructure, enabling faster, safer, and more convenient transit for rural residents to urban centres. It aims to boost tourism, improve market access for rural populations, and strengthen economic operations throughout the country (Sriraman, 1998, pp. 786-787). This marks a shift from radial road systems to a more interconnected, corridor-based network that suits Kerala's elongated, narrow shape (NHAI, 2022, p. 13). Enhancing the road network of Kerala through the Bharatmala Pariyojana will help to improve transportation, trade, support industrial growth, and address environmental issues simultaneously (MRTTH, 2023, p. 3). This project aims to boost local travel and contribute to the overall aim of creating an efficient and interconnected national transportation system. However, careful planning is essential to minimise displacement and environmental harm in densely populated and ecologically sensitive areas.

1.1. Decongesting Key Routes: Expanding National Highways

Expanding and modernising National Highways, the primary goal of Bharatmala is to raise their capacity from two lanes to four lanes and six lanes (NHAI, 2022, p. 45). Kerala has numerous national highways; yet, certain areas within the state experience traffic congestion and inadequate road infrastructure. The High Court of Kerala has mandated the National Highway Authority of India to provide reports regarding the severe traffic congestion caused by the current construction, highlighting the difficulties faced by drivers (TOI, 2025). The Bharatmala project incorporates multi-lane roadways, bypasses, and grade separators into key highways to enhance traffic flow. Significant attributes facilitate the alleviation of urban congestion and expedite the transit of commodities. Enhancements to infrastructure are crucial not just for expediting transportation but also for reducing fuel consumption and minimising air pollution (Sriraman, 1998, p. 786). The primary challenges associated with constructing additional national highways include complex road expansion initiatives resulting from urban development, insufficient land availability, and the substantial volume of vehicles on the road. In Kerala, many roads have experienced delays due to inadequate rights-of-way and exorbitant charges. This has

resulted in state government involvement and judicial examination (The Hindu, 2024; TOI, 2025). Bharatmala will benefit enterprises reliant on tourism and logistics, thereby reducing fuel consumption, transportation costs, and enhancing trade efficiency (Praveen, Salim & Aghilesh, 2024, p.246). Furthermore, Kerala's distinctive linear geography highlights the need for developing sustainable traffic solutions that prioritise connectivity and congestion management (NHAI, 2022, p. 45). The Bharatmala project aims to address longstanding issues within Kerala's national highway infrastructure.

1.2. Increasing Trade by Strengthening Economic Corridors

Economic corridors are meticulously designed road networks that link trade centres, commercial hubs, and industrial sites to national markets. Prabir De points out that "an economic corridor is an infrastructure that helps facilitate economic activities (De, 2014, p. 16)." Enhancing economic corridors is crucial for facilitating trade by linking transit infrastructure to commercial and industrial hubs. The elongated, narrow configuration of Kerala, along with its dependence on a dual-lane national highway system, hinders access to markets, despite the robust performance of its spice, rubber, seafood, and textile industries. Logistical efficiency is enhanced by facilitating the seamless movement of commodities among manufacturing sites, ports, and markets. This reduces trip duration and expenses (Nangia & Mahajan, 2003, pp. 52-53).

The National Highways Authority of India points out that Bharatmala will establish new economic corridors featuring dedicated lanes for goods, linking Kerala to industrial regions in Tamil Nadu, Karnataka, and other states. These enhancements will facilitate logistics, reduce delays, and expedite the transportation of perishable commodities. This will significantly benefit Kerala's spice exports, marine sector, and plantation products. Additionally, less congested roadways are crucial for maintaining the high quality of Kerala's spice exports on the global market, ensuring product freshness. The new economic corridors will facilitate exporters' access to ports, enhance the movement of substantial quantities of commodities, and reduce shipping expenses, thereby granting exporters a competitive advantage in global markets (NDTV, 2020). Strategically situating multimodal logistics parks along with these corridors enhances export competitiveness by accelerating the delivery of goods to their final destinations and reducing supply chain bottlenecks (De, 2014, pp. 21-24).

1.3. Enhancing Port Connectivity for Strengthening Trade and Export Infrastructure

Enhancing port accessibility is crucial for augmenting a region's capacity for trade and export, particularly in a coastal state of Kerala. Effective port connectivity integrates maritime infrastructure with terrestrial transportation systems such as highways and railways. This reduces transit time, decreases logistical expenses, and enhances the company's competitiveness in

international markets. The Bharatmala Pariyojana initiative aims to connect key ports in Kerala, including Kochi and Vizhinjam. This is anticipated to result in the establishment of logistical hubs, facilitating the movement of commodities and attracting foreign investment in the export sector. An effective link between the port and the highway can enhance the functionality of the fragmented transport infrastructure of Kerala. Facilitating the movement of ships to and from ports and their hinterlands significantly enhances port throughput and simplifies logistics (Prasad, 2022, pp. 723-724). The Bharatmala project emphasises the construction of feeder highways and multi-modal logistics parks adjacent to ports to enhance connectivity between rural producers and export markets. This strategy resembles the effective coordinated enhancements in Southeast Asian port and road infrastructures, which have significantly improved trade. Improved access to ports influences social and economic variables that extend beyond commercial activities. It facilitates access to global markets for local firms, particularly those involved in the production of seafood, spices, and coir. This generates employment and fosters inclusive regional development. Small enterprises in Kerala face difficulties competing in exports due to inadequate road connections to the hinterland. Implementing targeted modifications to infrastructure is crucial for economic stability and progress. Enhancing national highways and facilitating access to ports are crucial components in establishing a strong trade and export ecosystem. In Kerala, where the economy is intricately linked to maritime trade, such projects could facilitate structural transformations aligned with the region's broader objectives of sustainable development.

1.4. Urban Traffic Decongestion: Elevated Corridors and Bypass Roads

The major cities of Kerala, Thiruvanthapuram, Kochi and Kozhikode, faces severe traffic congestion that prolongs travel time, worsens air pollution and reduces productivity. This type of traffic congestion has significantly impeded mobility inside the city, adversely affecting productivity and diminishing its liveability (Nangia & Mahajan, 2003, pp. 47-49).

Occasionally, brief excursions within urban areas may require considerable time. Such issues frequently indicate congested traffic, resulting in diminished fuel economy, increased vehicle emissions, and increased pollution. Sudesh Nangia and LC Mahajan points that these factors collectively constitute significant challenges that contemporary cities encounter regarding transportation and overall quality of life (Nangia & Mahajan, 2003, pp. 47-52). The Bharatmala Pariyojana aims to facilitate urban mobility by constructing bypass highways, elevated corridors, and ring roads in densely populated regions. The objective of these infrastructural enhancements is to provide smoother traffic flow by diverting through-traffic from congested urban centres. The anticipated Outer Ring Road in Thiruvananthapuram and additional flyovers in Kochi and Kozhikode exemplify this approach effectively. These modifications aim to enhance traffic flow and diminish pollution. This transportation system is anticipated to enhance economic growth in

urban areas by facilitating mobility, attracting company investments, and promoting the construction of new residences. Enhancements in transit facilitate the movement of commodities and individuals, generate employment opportunities, and alleviate urban congestion. The urban segment of Bharatmala illustrates the significance of integrating infrastructure development, traffic management, and economic enhancement within a region. Although the primary emphasis may be on urban traffic management, issues pertaining to transportation in rural areas are not overlooked. The Bharatmala Pariyojana establishes a logical connectivity between cities and towns. Cities exhibit heightened transportation demand; nonetheless, the traffic needs recognises the necessity for connectivity between rural and urban regions. Bharatmala aims to facilitate commuting between various regions, thereby reducing the transportation disparity between urban and rural areas. This will promote economic expansion in the region and enhance mobility for all individuals in urban and suburban areas.

1.5. Getting Beyond Geographic Obstacles: Bridges and Tunnels

The topography of Kerala is distinctive and frequently challenging, characterised by intricate river systems, landslide-prone mountains such as the Western Ghats, and low-lying areas susceptible to flooding. This has impeded the state's ability to develop an effective road transit system (Praveen, Salim & Aghilesh, 2024, p.243). This has significantly impacted the already fragile social and economic conditions in rural regions, such as Wayanad and Idukki, where inadequate road connections have exacerbated regional disparities and hindered access to essential services. The Bharatmala Pariyojana prioritises the construction of substantial tunnels and bridges to eliminate natural obstacles and facilitate transportation in such regions. The recently inaugurated Wayanad Tunnel Project constitutes a significant component of this initiative. The objective is to construct a more concise, all-weather pathway from Wayanad to Kozhikode. This project is anticipated to reduce travel time by almost an hour, facilitating the movement of both freight and passengers. Comparable initiatives are also emerging in the Idukki district too. Residents of Idukki have started discussions for the construction of tunnels connecting Moolamattam to Cheruthony, and Cumbam, in Tamil Nadu, to Kattappana. These tunnels might significantly reduce travel connectivity in the region. Constructing new bridges over major rivers such as the Periyar and Bharathapuzha, is anticipated to enhance traffic reliability in Kerala during severe monsoon seasons. These infrastructural enhancements are significant for reasons beyond merely facilitating access to elevated regions. They facilitate tourism, enhance accessibility to markets, and improve disaster response systems. The Bharatmala infrastructure initiative would enhance connectivity beyond mere improvements. The objective of the project is to enhance the long-term economic viability of Kerala's underdeveloped regions by constructing additional national highways, fortifying trade routes, improving port accessibility, and expanding transportation options in urban and rural locales.

These strategies aim to reduce transportation expenses, enhance logistical efficiency, and promote sustained collaboration between urban and rural regions of Kerala. This will facilitate a balanced and inclusive economic growth and development of the region.

1.6. The Role of Bharatmala Pariyojana in Improving Tourism

Tourism in India is frequently hindered by accessibility issues, particularly in remote areas of historical significance. National highways, particularly those developed under the Bharatmala initiative, address these issues by linking major cities, airports, and railway stations to prominent tourism destinations. Infrastructure for connectivity is crucial for the growth of tourism, especially in a country like India, which has diverse cultures. Manoj Edward and Babu P George point out that tourism is considered as an essential ingredient to bring in development to a region (Edward & George, 2008, pp. 2021). Hence, to develop tourism, excellent road facilities are crucial. In this perspective, improved highways to key tourist destinations attract more visitors from India and other countries. The Bharatmala Pariyojana aims to establish economic corridors and feeder highways that connect commercial and logistics centres with tourism destinations. This infrastructure facilitates travel and supports the growth of roadside hospitality enterprises, including motels, food courts, vendors, and eco-resorts. These supplementary services help individuals in rural regions secure employment and contribute to the prosperity of their local economies. Improved highways facilitate the efficacy of emergency response and traffic safety systems, hence enhancing the safety and appeal of long-distance travel for visitors. Advancing underappreciated regions through highway-centric tourism may enhance accessibility to development in the tourism sector. This aligns with the Bharatmala objective of equitable development across regions, which aims to distribute tourist traffic more uniformly and prevent congestion in popular destinations of the country, which are currently overburdened. Besides, the tourists may prefer to travel to diverse destinations, hence all tourism-promoting areas may get developed and established (Edward & George, 2008, pp. 16-18). Enhanced road connectivity to tribal and eco-tourism circuits facilitates the emergence of tribal centred tourism. Tribal tourism has become very popular among sociologists and foreign travellers. They want to explore their culture, way of life, clothing and food patterns, beliefs, social interactions, farming and hunting skills, festivals, and celebrations, among other aspects. Many of the tribal settlements are protected areas, and people explore the available ones to compare with the modern civilization. Road accessibility is the primary concern for promoting such tourism, and national highway development becomes instrumental for these explorations. The Bharatmala Pariyojana primarily focuses on road construction, although it may have a significant impact on the tourism sector. National roads are crucial for transforming India's tourism landscape as they facilitate travel, support the service sectors, and maintain a balanced flow of tourism.

2. Future Concerns of the Bharatmala Project in Kerala

The Bharatmala Pariyojana brings substantial benefits to the transportation sector of Kerala. However, there are multifaceted issues related to its future expansion in the state. Acquiring the necessary land constitutes one of the most significant challenges in its future development (Shinoj & Gokuldeepan, 2020, p.585). Kerala addresses this challenging issue in a distinct manner compared to numerous other Indian states. The state is densely populated, with the land partitioned into small plots. This complicates the development of the transport infrastructure. The suggested national highway alignments under Bharatmala typically traverse residential areas, agricultural lands, and ecologically significant sites.

A significant number of local residents oppose the proposal, perceiving it as a threat to their residences, employment, and the delicate ecological balance of the region. The land acquisition generally disregards the historical and cultural significance of many preserved treasures in the state (Shinoj & Gokuldeepan, 2020, p.586). In Kerala, land ownership carries deep social and cultural significance, making acquisition disputes more sensitive than in many other states. Inadequate consent processes often fuel for public resistance. Consequently, the Bharatmala project may engender societal and legal issues. This resistance is increasingly justified in light of the heightened discourse surrounding sustainable and inclusive infrastructure, which emphasises the necessity for development that does not marginalise poor groups. A significant concern is the potential environmental impact of constructing numerous roads. Sheeba Abraham has demonstrated that converting rice fields into highways adversely affects wetland ecosystems and complicates water management in a drought-prone state (Abraham, 2015, p. 4). Environmentalists believe that the Bharatmala Pariyojana may adversely impact the environment, particularly in ecologically sensitive regions such as the Western Ghats. The Western Ghats are a crucial water catchment area, hosting around thousands of species of flora and fauna, many of which are endemic to this region.

New national highways periodically traverse dense forests, disrupting wildlife and fragmenting ecological corridors. This endangers human settlements, diminishes forest resilience, and alters water flow, hence increasing the likelihood of landslides and soil erosion during monsoons.

Local communities, ecologists, and civil society organisations advocate for planning methodologies that are more inclusive and sustainable (Sabeena & Sumesh, 2024, p. 13). They are additionally contesting in court, which further complicates matters. These organisations advocate for environmental justice, asserting that infrastructural expansion should not compromise Kerala's natural resources or the well-being of its populace. The Bharatmala initiative is expected to benefit the national economy. Researchers continue to investigate its environmental impacts, particularly in Kerala's vulnerable regions, the community, and its long-

term consequences. Until priorities are realigned to achieve a balance between development and environmental conservation, the long-term viability of such projects remains uncertain. The Bharatmala Pariyojana in Kerala may ultimately hinder local development aspirations. Actually, the goal of this project is to enhance national connectivity and facilitate the movement of people, goods and services over long distances. However, there is a chance that this top-down infrastructure paradigm may not adequately address the mobility demands of rural and peri-urban populations. In addition, certain individuals assert that the Bharatmala project may exacerbate spatial disparities if it fails to integrate effectively with regional transport systems and community planning instruments. If national highway development continues to prioritise the movement of vehicles and the construction of industrial corridors without considering their integration with local communities and their environmental concerns, then it may become an instrument of exclusion that benefits transit economies while undermining the mobility rights and economic prospects of local residents. For Bharatmala to effectively benefit the populace, it must achieve a balance between its objectives and their implementation. It must ensure that long-term transport planning benefits both the environment and the local economy.

Conclusion

Bharatmala presents an opportunity for Kerala to transform by enhancing highways, facilitating access to ports, and linking rural and urban economies. It could enhance Kerala's engagement in national and international markets by reducing logistical expenses, increasing tourism, and facilitating trade. However, there remain issues that could jeopardize its long-term viability, such as disputes around land acquisition, environmental degradation, and governance challenges. If these issues are not adequately addressed, they may undermine community support and exacerbate ecological challenges. The success of the project in Kerala will hinge on reconciling national connectivity aspirations with local developmental objectives. Bharatmala has substantial long-term advantages that significantly outweigh its challenges despite its management difficulties. If executed well, the project has the potential to position Kerala as a model for how infrastructure can stimulate economic growth, thereby positively impacting the tourism, commerce, and industrial sectors of India. Establishing regulations that emphasize fair land acquisition, transparent governance, and environmentally conscious construction is essential. Bharatmala can fulfill its commitment solely by prioritizing inclusive, sustainable, and region-specific advantages, rather than hastily constructing projects at the cost of social and environmental justice. This will guide the state towards a bright and prosperous future that is more interconnected, competitive and affluent.

Abbreviations

MRTH – Ministry of Road Transport and Highways

NHAI – National Highway Authority of India

TOI – Times of India

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