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Role of Road Infrastructure towards Rural Development in Karnataka

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Abstract:
Since the implementation of the First Five-Year Plan, there has been a substantial allocation of resources by the Indian and state governments towards developing agricultural infrastructure, intending to expedite economic growth. Infrastructure investments, such as irrigation, transportation, electric power, and agricultural markets, have contributed to agricultural development on a large scale. However, these expenditures have also resulted in significant regional variations in agricultural growth. Since the state is responsible for providing infrastructure, policymakers allocate significant resources to regions experiencing rapid agricultural expansion to accomplish additional developmental objectives, such as poverty reduction. The provision of financial resources by the government facilitates and sustains this endeavor. Hence, the presence of bias in decision-making processes and the varying financial capacities of governments play a significant role in determining the amount of infrastructure development across different regions. Consequently, this imbalance in infrastructure investment has implications for agricultural growth and regional development. This research investigates the impact of road infrastructure on agricultural expansion using secondary data collection methods
Keywords: Rural Infrastructure, Rural Development, Karnataka

Introduction

Infrastructure services are commonly delivered by private entities, with the public sector support. Infrastructure systems such as water supply, sanitary facilities, transportation networks, power plants, telecommunications networks, irrigation dams, regulated markets, and financial institutions play a crucial role in facilitating the provision of essential services. The agricultural infrastructure encompasses a comprehensive array of essential services, facilities, equipment, and institutions that are indispensable for the advancement and optimization of the food and fiber industry.

Infrastructure investment necessitates a steadfast dedication to the examination and collaborative extension system, which enhances the efficiency of agricultural infrastructure agencies in various aspects such as production, marketing, food safety, nutrition, and natural resource conservation. Various sorts of infrastructure, such as economic, social, financial, technical, agricultural, and others, are present in society. The presence of various infrastructures is essential and mutually reinforcing for the promotion of economic development. The aggregate advantages derived from the various types of infrastructure surpass the individual benefits of each form. Therefore, the provision of numerous vital infrastructure facilities yields greater overall advantages compared to the provision of a single facility. This statement suggests that the development and economic expansion of a region or sector are influenced by the presence and quality of infrastructure, both in terms of its vertical and horizontal dimensions.

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The economic growth paradigm examines the relationship between production factors and aggregate output. In a market characterized by perfect competition and the absence of externalities, the remuneration received by factors of production is equivalent to the marginal value of goods they generate. The policy implications for sector investment levels arise from the market's response to pricing signals that primarily consider private rewards and disregard externalities. In order to enhance the efficient allocation of resources, significant externalities necessitate government action, albeit at the expense of incurring expenditures. The provision of infrastructure services by the public sector sometimes leads to their rationing or absence of pricing, which poses challenges in accurately assessing the private productivity of infrastructure capital. Research in the field of development economics has demonstrated that there exists a positive correlation between levels of infrastructure and economic growth. Keynesian macroeconomics establishes a connection between expenditure and both output and income. It is important to acknowledge that among the four components that contribute to a country's income, namely consumption expenditure, investment expenditure, government expenditure, and net income from abroad, investment income is derived from private and government expenditures. Within the framework of the Keynesian model, the evaluation of revenue is conducted on an annual basis. In contrast, the investment concept includes long-term investments such as developing infrastructural facilities. Infrastructure investment is justified from an economic standpoint due to the underlying assumption in the model that there exists a positive relationship between income and investment.

According to Rostow (1960), the development and enhancement of transportation and infrastructure are essential prerequisites for the accumulation of capital, the facilitation of production, and the enhancement of productivity across different phases of economic growth. The correlation between infrastructure investment and economic growth necessitates aligning supply and demand to prevent disequilibrium, mitigating regional disparities. The notion of economic public goods serves as the foundation for infrastructure theory. Investments in fundamental infrastructure contribute to the provision of public goods. Prominent characteristics encompass: Non-excludability refers to the condition where it is not possible to exclude any member of a user group from accessing infrastructure services unless there is rigorous enforcement in place. Despite the potential legal restrictions on accessing benefits, the associated processing costs would render it financially impractical. As an illustration, the act of prohibiting a farmer situated downstream of a recently constructed irrigation dam from utilizing the groundwater replenished by said dam would incur greater costs. Additionally, the concept of non-rival consumption implies that the consumption of one individual does not impede that of another unless a negative externality issue, such as water pollution, emerges. In the absence of significant water pollution, the utilization of water resources by one entity, such as an industry utilizing a river for waste disposal, does not impact the utilization of water resources by another entity, such as a farmer using water for irrigation purposes. Infrastructure can be regarded as a form of social capital that benefits society without generating externalities.

Agricultural infrastructure plays a key role in developing countries, particularly those where a significant portion of the impoverished population depends on agriculture for survival. The augmentation of infrastructure has a positive impact on economic growth. Therefore, it is imperative for regional perspectives to analyze the correlation between agricultural development and infrastructure thoroughly. Infrastructure investment plays a significant role in fostering the expansion of the agricultural sector, which in turn contributes to poverty

alleviation. This is evident through the various components associated with agricultural development, including employment opportunities, income generation, and overall output. Hence, it is plausible that disparities in agricultural growth among regions can be attributed to variations in farm infrastructure. As previously stated, our primary objective is to analyze the role of infrastructure in facilitating agricultural expansion and fostering regional progress. The current analysis aims to identify underdeveloped regions by evaluating their agricultural infrastructure and, after that, recommend policy adjustments to stimulate regional economies. The above factors enhance regional value-added, social benefits, economies of scale, accelerator effects, increased welfare of producers and consumers, and reduced price oscillation.

Objectives

- The objective of this study is to analyze the influence of rural infrastructure on agricultural development in Karnataka.
- This research aims to investigate the effects of road and irrigation infrastructure initiatives on agricultural development.

Role of Rural Infrastructure on Agricultural Development

Many emerging nations acknowledge the significance of agricultural infrastructure. The development of rural infrastructure plays a crucial role in enhancing productivity and reducing poverty. Various elements such as climate, government assistance, technical advancements, policy decisions, and international trade have the potential to enhance output. However, it is important to recognize that ground-level infrastructure remains a critical component. The authorities in India have faced persistent challenges in achieving a harmonious distribution of economic growth across different regions. A limited number of expanding economic sectors might lead to developmental disparities arising from disparities between rural and urban areas. Agriculture, the predominant sector in rural areas, has exhibited subpar performance.

Even though over 50% of the rural population is employed in this sector, there has been a decline in the share of GDP, suggesting a lacklustre performance. In contemporary times, the expansion of agriculture continues to mitigate disparities between regions. The state of Karnataka presents a compelling case study for examining the correlation between agricultural growth and rural infrastructure, owing to its notable fluctuations in production. The majority of Northern Karnataka experiences little growth as a result of extensive arid regions and districts that are susceptible to drought. The extensive expanse of arid, non-irrigated terrain, predominantly located in Northern Karnataka, has a profound impact on the socio-economic progress of the indigenous population in numerous consequential manners. Regional variations in agricultural success can frequently be attributed to natural resource endowments, socio-economic factors, and institutional issues. Considering the significance of infrastructure in facilitating agricultural development, it is imperative to analyze the potential of focused infrastructure initiatives in mitigating regional differences. In order to enhance productivity and foster growth in the primary sector, it is imperative to utilize limited resources effectively.

The assumption underlying the provision of economic and institutional infrastructure, as well as essential services and facilities to the agricultural community, is that the farmers possess the requisite skills and competencies to exploit their capabilities fully. In this context, the significance of social infrastructure development lies in its indirect contribution to the overall development processes. Enhancing the skill development of farmers is essential in order to enhance their operational precision in accessing and utilizing services offered by various infrastructural infrastructures. Within the realm of agricultural research literature, it is evident

that social infrastructure has yet to garner an equivalent level of scrutiny compared to economic and institutional infrastructure. Integrating all three rural infrastructure categories, along with enhanced agricultural inputs such as advanced seeds, fertilizers, and agricultural machinery, plays a significant role in influencing decisions related to inputs and farming practices, ultimately leading to a notable increase in agricultural output.

Furthermore, it is imperative to ensure that infrastructures are made readily accessible in rural regions. Furthermore, optimal utilization of these public facilities and services is imperative to maximize the returns on these expenditures and enhance agricultural productivity. In our framework, economic policy and political factors are considered exogenous factors necessary for infrastructure investment.

Impact of Road Infrastructure in Agricultural Development

India's agricultural sector is vital. Most people rely on agriculture as their primary means of sustenance, contributing to 17.5 percent of the Gross Value Added (GVA) according to the Economic Survey of 2015-16. Furthermore, as reported by the Census of 2011, around 68.84 percent of the population resides in rural regions and relies heavily on agricultural activities for their livelihoods. The agricultural sector in India constitutes the primary source of employment for almost half of the country's workforce while also utilizing approximately 43% of its total land area. Therefore, the government must establish infrastructure and resources to enhance agricultural productivity to attain developmental objectives such as ensuring food security, promoting industrial growth, mitigating unemployment, and alleviating poverty. The agriculture sector has experienced significant growth due to government initiatives to enhance agricultural productivity. Farmers continue to face challenges in reaping benefits. The agricultural sector in India faces a deficiency in terms of equipment. Infrastructure encompasses a range of sectors, such as fiscal, financial, technological, social, agricultural, and various others. Agricultural infrastructure holds significant importance in developing nations, particularly those where a substantial portion of the impoverished population depends on agriculture for survival. The agricultural sector continues to provide employment opportunities for approximately half of the workforce. The correlation between infrastructure enhancements and agricultural expansion should be established. The significance of this matter lies in the fact that the agricultural sector plays a crucial role in poverty reduction and is highly reliant on investments in infrastructure. Hence, the expansion of agriculture is intricately connected to infrastructure development. Our primary objective is to examine the role of infrastructure in promoting agricultural development. The agricultural infrastructure encompasses the provision of rural roadways. The absence of village-to-market pathways that can withstand all weather conditions has impeded agricultural activities in India. Many rural communities suffer from a lack of infrastructure, particularly in terms of road connectivity between villages and market centres, as well as between villages themselves. The enhancement of road infrastructure would result in a reduction in both average and marginal output costs. This would be achieved by incentivizing the use of more efficient inputs and agricultural techniques, as well as by decreasing the expenses associated with inventory management and the acquisition of inputs from the market. Implementing all-weather roads would facilitate the adoption of modern agricultural practices by farms.

Rural road infrastructure is crucial in facilitating economic and social services, bolstering agricultural income, and generating productive employment opportunities. India is home to over 600 million individuals residing in 600,000 municipalities. Road infrastructure

facilitates the integration of individuals residing in rural areas into the broader societal framework. Enhanced road infrastructure has been found to have a positive impact on various aspects of agricultural operations, including the efficient supply of farm inputs, reduced transportation expenses, and increased productivity and distribution of specialized agricultural products. The improvement of road infrastructure is expected to have a positive impact on the facilitation of agricultural trade and delivery. A well-developed infrastructure plays a crucial role in facilitating the growth, expansion, and efficient functioning of factor markets. Additionally, it subjects rural economies to increased competition. Potential options for cost reduction include sourcing products from suppliers with lower costs or introducing new and enhanced products that replace domestically manufactured goods. Numerous studies have demonstrated that allocating resources towards infrastructure development contributes to augmenting rural incomes. The acreage dedicated to export crops exhibited a positive correlation with both the quality of road infrastructure and the distance from industrial centres.

According to Bonney (1964), allocating resources toward the development of rural roads has the potential to stimulate economic activity, reduce transportation costs for both goods and individuals and enhance the provision of various services. Roads serve as a critical component of a nation's infrastructure. The rural characteristics of India need the utmost importance of rural facilities. Rural roads serve the purpose of connecting rural regions and exert an influence on cropping patterns by facilitating market access. Additionally, they contribute to enhanced productivity by ensuring the availability of essential inputs such as fertilizer, seeds, and pesticides. Moreover, these roads have a positive impact on the prices received by farmers for agricultural and related products, including milk. Furthermore, they play a role in promoting school attendance and generating new employment opportunities in non-farm and service sectors. The implementation of all-weather walkways has the potential to enhance agricultural productivity significantly. The impact of this phenomenon will primarily be observed in perishable agricultural commodities such as fresh vegetables, milk, eggs, poultry, and fresh fruits. The transportation of these commodities roughly and slowly has the potential to affect their quality adversely. The absence of village-to-market roadways that can withstand all weather conditions hinders the market-oriented productivity of these communities. Rural road infrastructure and transportation networks play a pivotal role in enhancing agricultural connectivity and mitigating the isolation of rural communities, thereby fostering the engagement and empowerment of rural farmers. In order to optimize the allocation of food resources and expedite rural development in India, it is imperative to establish rural transport services that facilitate the movement of products to consumer centres and agricultural inputs to rural regions. It serves as a safeguard for farmers and rural artisans against dishonest traders and intermediaries while also providing additional financial support to compensate for their limited earnings.

Rural Road Infrastructure Development Programmes in India

Expanding rural road connectivity in India facilitates the accessibility of economic and social services, hence fostering the growth of agricultural incomes productive employment, and ultimately contributing to poverty reduction. Despite implementing many State and Central Programs throughout the years, many habitation areas in the country still need proper connectivity through all-weather roads. It is widely acknowledged that in cases when connectivity has been established, the roads that have been constructed often need to meet the criteria of being classed as All-weather roads due to issues such as substandard construction or

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inadequate maintenance. The Pradhan Mantri Gram Sadak Yojana was initiated by the government on December 25, 2000, to provide all-weather access to qualified habitations that were previously unconnected. The Pradhan Mantri Gram Sadak Yojana 1 (PMGSY) is a centrally supported initiative that receives full financial support from the government. The program collects a fee of $0.75 per litter from the High-Speed Diesel (HSD) Cess. The primary objective of the Pradhan Mantri Gram Sadak Yojana (PMGSY) is to establish connectivity between rural areas that meet the eligibility criteria, specifically those with a population of 500 or over in plain regions. This connectivity is achieved by constructing all-weather roads with culverts and cross-drainage structures. The objective is to establish connectivity among eligible unconnected Habitations that have a population of 250 or more in the Hill States (North-East et al., Jammu & Kashmir, and Uttarakhand), Desert Areas (as designated in the Desert Development Programme), Tribal (Schedule V) areas, and Selected Tribal and Backward Districts (as identified by the Ministry of Home Affairs and Planning Commission).

Roads

In the realm of road infrastructure development, there has been a sustained and continuous expansion. The primary emphasis during the fiscal year of 2021-22 was placed on district roadways, aligning with the state's objectives and strategies to augment the innovation and industrial capabilities of districts beyond Bengaluru.

Table: 1 Ranking of States Based on Sector-wise RIDF Allocation (Top 10 States)

Rural Road Connectivity	
State	**Share**
Uttar Pradesh	22.218
Bihar	9.095
Rajasthan	7.876
Madhya Pradesh	7.695
Maharashtra	7.382
Gujarat	5.047
West Bengal	4.805
Karnataka	4.463
Andhra Pradesh	4.373
Jharkhand	3.891

Source-(2021) NABARD RESEARCH STUDY

The above are top 10 States Ranked by Sector-wise Allocation of Rural Infrastructure Development Fund (RIDF) related to rural road connectivity in India.

Table: 2 The Road lengths in Karnataka (In Km)

The Road lengths in Karnataka (In Km)			
Category of Road	**2020-21**	**2021-22**	**2022-23**
National Highways	7652	7652	7652*
State Highways	28985	28985	27880*
Major District Roads	55474	55474	56115*
Municipal Roads & Other Roads	40487.59	43964.01	43964.01**
Rural Roads	198500.80	194438.02	197282.83***
All Roads	331099.39	330513.03	332893.84

Source:(https://des.karnataka.gov.in/storage/pdffiles/KARNATAKA%20ECONOMIC%20SURVEY%202021-22-M2_ENG_FINAL.pdf, n.d.)**.**

Chief Minister Gram Sadak Yojana

The objective is to ensure comprehensive connectivity to rural habitations during all seasons, adhering to established design requirements and upholding these standards to facilitate the general social and economic progress of these areas. The state government has outlined its intention to construct a total of 5,600 kilometres of road under the Gram Sadak Yojana by the year 2021. In the present fiscal year, the Central Government has allocated a sum of Rs. 38,078 Crore to implement centrally-sponsored initiatives in the state of Karnataka. The Central Government's share of this total amounts to Rs. 17,536 Crore. As per an authoritative declaration, the Center mentioned above has disbursed 4,074 billion rupees.

Namma Grama Namma Raste Yojana

The development of rural road connectivity in India plays a crucial role in facilitating the accessibility of economic and social services. This, in turn, leads to a rise in agricultural incomes, productivity, and the creation of productive employment opportunities. Ultimately, these outcomes contribute to the sustained decrease of poverty in the country. The Namma Grama Namma Raste Yojana was initiated by the Karnataka Department of Rural Development and Panchayat Raj in January 2010 to facilitate year-round connectivity to formerly isolated settlements. The state entirely funds the organization known as NGNRY. The primary objective of the NGNRY is to establish connectivity between qualifying rural Habitations and all-weather roads, incorporating culverts and cross-drainage structures. In cases when all eligible Habitations possess all-weather road access, the NGNRY will provide permission for road enhancements. The state has allocated Rs 3,658 crore for rural road-building initiatives in 189 Assembly constituencies. A proposed initiative aims to construct 20/30 km of rural roads inside each of the 189 Assembly seats. The estimated cost for this project is Rs 42 lakh per kilometre, which includes provisions for five years of maintenance. In the initial phase of the NGNRY project, 1400 works, spanning a distance of 3714.65 kilometres, were accepted and completed.

Table: 3 Scheme wise progress of Rural Roads, RDPR department as on January 2023 (AVALOKANA) (Rs in crores)

Scheme Name	**Allocation (BE+SE) Release Total Expenditur**	**Allocation (BE+SE) Release Total Expenditur**	**Allocation (BE+SE) Release Total Expenditur**
Pradhan Mantri Grama Sadak Yojane-Road Maintenance	81.52	61.14	52.86
Namma Grama Namma Raste Scheme (NGNRY) and other Rural Road Schemes	120.00	90.00	94.57
Special Grants to Rural Roads (Mukhya Mantri Gramina Raste Abhivruddi Yojane)	242.44	68.72	119.07
Total	**443.96**	**219.86**	**266.50**

Source: (*Economic Survey 2022-23*, n.d.)

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The present analysis outlines the chronological advancement of rural road development under the Rural Development and Panchayat Raj (RDPR) department as of January 2023, with financial figures denoted in crores of Indian Rupees.

Rural Road Statistics of Karnataka as on March 2019 (Road Length in kms)

Category of Road	Length (kms)	Percentage of Length
Bituminous surface	52,521	27.51
Metal surface	26,026	13.63
Earthen/Gravel Roads	1,12,315	58.86
Total	**1,90,862**	**100.00**

Source-(*Economic Survey 2022-23*, n.d.)**,** (*Home - Planning, Programme Monitoring and Statistics Department*, n.d.)**.**

Table: 4Rural Roads in Karnataka 1956-2019, (Road Length in kms)

Years	Rural Roads	Decadal Growth
1956	2373	**-**
1966	11532	385.96
1976	62602	442.85
1986	85335	36.31
1996	85361	00.03
2006	115840	35.70
2016	177542	53.26
2017	177542	**-**
2018	190862	7.50
2019	190862	-
% increase over 1956	7943.06	-

Source-(*Home - Directorate of Economics and Statistics*, n.d.)**,** (*Annual_Report - Rural Development and Panchayat Raj Department*, n.d.)

The tabulated data illustrates a substantial expansion of the rural road infrastructure in Karnataka between 1956 and 2019, exhibiting a growth rate of 79-fold. In 1956, the state's rural road network spanned roughly 2,373 kilometres. The metric above experienced a substantial surge, reaching a value of 11,532 kilometres in 1966. This notable increase corresponds to a gain of 386 percentage points. In 2016, the total length of roads expanded to 177,542 kilometres, reflecting a growth rate of 53.26 percent compared to the figures recorded in 2006. Between 1986 and 1996, the pace of expansion for rural road infrastructure had a notably modest rise, as seen by a recorded increase of approximately 0.03 percent.

Table: 5 Rural Road Development in the short-run (2007-08 – 2018-19)

Years	Rural Roads	Percentage of Growth	Surfaced Rural Roads			Total No. of Habitation	No. of Habitations access to all Weather Roads
			Black Tap (Asphalted Roads)	Water Bound Macadam	Unsurfaced		
2007-08	1,47,212	00.00	39394 (26.76)	24730 (16.79)	83088 (56.45)	-	-
2008-	1,47,21	00.00	39394	24730	83088	1718	-

09	2		(26.76)	(16.79)	(56.45)		
2009-10	1,47,212	00.00	43845 (29.78)	22059 (14.98)	81308 (55.24)	2235	
2010-11	1,47,212	00.00	45393 (30.83)	22359 (15.17)	79460 (54.00)	57,417	36,720
2011-12	1,47,212	00.00	47744 (32.43)	25771 (17.50)	73697 (50.07)	57,417	38,057
2012-13	1,55,546	05.77	58184 (37.40)	21495 (13.81)	75867 (48.79)	57,417	39,376
2013-14	1,55,546	00.00	58184 (37.40)	21495 (13.81)	75867 (48.79)	68,431	47,043
2014-15	1,55,546	00.00	58184 (37.40)	21495 (13.81)	75867 (48.79)	68,431	47,043
2015-16	1,76,565	13.51	63103 (35.73)	23150 (13.11)	90312 (51.16)	68,431	36,760
2016-17	1,77,542	0.55	63374 (35.70)	23059 (13.00)	91109 (51.30)	64,049	41,631
2017-18	1,90,862	7.50	52521 (27.51)	26026 (13.63)	112315 (58.86)		
2018-19	1,90,862	-	52521 (27.51)	26026 (13.63)	112315 (58.86)		
% increase over 2007-08	29.65	-	33.32	5.24	35.17		

Source-(*Economic Survey 2022-23*, n.d.)**,** (*Home - Planning, Programme Monitoring and Statistics Department*, n.d.)

The tabulated data illustrates that the length of rural roads in Karnataka exhibited a consistent measure of 190,862 kilometres during the fiscal year 2018-19, in contrast to the recorded length of 147,212 kilometres during the fiscal year 2007-08. This data indicates a substantial increase of 29.65 percent in the rural road infrastructure in Karnataka. There are a total of 41,631 residential areas within the state that have access to road infrastructure that is designed to resist adverse weather conditions. Furthermore, it is worth noting that there has been an increase in the transformation of Water Bound Macadam Roads into block-top roads in Karnataka. The overall length of these roads expanded from 24,730 kilometres in 2007-08 to 26,026 kilometres in the fiscal year 2018-19. During the 2018-19 period, it was observed that around 58.86% of the rural road networks within the state were found to be without a paved surface. The figure above demonstrates a noteworthy escalation compared to the 35.17% documented in the academic year of 2007-08, giving rise to a substantial level of apprehension.

Issues & Challenges

There is considerable variation in the inter-district connection of National Highways and State Highways within the road network of the State. The existing discrepancy in connection

necessitates resolution in alignment with the findings of Dr. Nanjudappa's research on addressing the regional imbalance. As a result, authorization has been granted to enhance 9601 kilometres of state highways and 15510 kilometres of main district roads for the fiscal year 2020-21. "Country Roads" is a popular song that was released in 1971. Bill Danoff, Taffy Nivert, and John Denver wrote it. The establishment of connectivity in rural areas is of paramount importance for the comprehensive development of the State. The expeditious implementation of road construction projects can generate a multiplier effect, contributing to the general development and progress of undeveloped regions. The allocation of resources towards transportation infrastructure has been found to have a significant impact on poverty reduction and the enhancement of total factor productivity.

Approximately 23% of State Highways and 79% of Major District Roads are characterized by a single-lane width. The expansion of two-lane capacity on state highways and select key district roads is necessary in order to alleviate traffic congestion, contingent upon the level of vehicle density. "Passenger Car Unit" (PCU) is a standardized measure used in transportation planning and analysis. The widening of State Highways is being undertaken by the Karnataka Road Development Corporation Limited (KRDCL) and the Karnataka State Highways Improvement Project (KSHIP) based on the Core Road Network concept. Between March 2021 and December 2022, there was a notable rise in the total number of automobiles inside the State, reaching an approximate figure of 2.3 million. As of December 22nd, the State has recorded 295,000,000 registered automobiles. In order to accommodate the growing number of vehicles, it is imperative to undertake the widening of both National Highways and State Highways. Currently, a mere 29 percent of national highways and a mere 2.4 percent of state highways possess carriageway proportions that accommodate four lanes. The Government of India, in collaboration with the National Highway Authority of India, has initiated a project to improve the National highways inside the State. The National Highways Authority of India (NHAI) is now executing infrastructure projects involving the development of four- and six-lane National Highways. Presently, an expenditure of Rs. 32,793 crore is allocated towards advancing 1,885 kilometres of the National Highway.

Conclusion

Roads are widely recognized as playing a crucial role in enhancing the social, economic, and cultural aspects of society. The provision of an improved road network in rural regions has been found to have a substantial positive impact on the socioeconomic level of rural inhabitants and the overall quality of their living conditions. The interdependence between roads and agricultural productivity is evident, whereby the impact of heightened agricultural output on the income, living standards, attitudes, and other pursuits of rural populations is contingent upon the calibre of the connecting road infrastructure. Due to this rationale, the Indian government emphasized the development of rural road infrastructure by implementing initiatives such as Pradhana Mantri Gram Sadak Yojana, Bharath Nirman, and the Rural Infrastructure Development Fund, among other programs. These projects facilitate infrastructure development in the rural farming sector, enhancing agricultural productivity and fostering socioeconomic advancement among the impoverished rural population.

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