

## **RURAL ROADS INFRASTRUCTURE UNDER PMGSY IN INDIA AND WEST BENGAL**

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### **ABSTRACT**

*A huge proportion of the India's poor reside in rural areas, where high expenses and lack of connection impede economic activity. By giving access to facilities such as education, health, and marketing, rural road infrastructure becomes an important component in the socioeconomic development of rural populations. However, the country's rural road network has developed in an unbalanced manner. With this in mind, the Government of India introduced the Pradhan Mantri Gram Sadak Yojana in 2000 to offer connection to disconnected eligible habitations and upgrade select existing roads to standard. This paper attempts to explain the advances in infrastructure under a big rural road-building programme known as PMGSY in several states of India, particularly in West Bengal, using two key indicators: rural road density and rural road availability on basic road infrastructure.*

**KEYWORDS:** Rural Road, PMGSY, Road Density, Road Availability.

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### **INTRODUCTION**

The importance of a good road network for rural India's socio-economic growth, and thus for the entire country, was recognized early on in India (Samanta,2015).The Nagpur Plan, which ran from 1943 to 1961, looked at the country's long-term road needs and try to made a classification of the road system into a functional order that included National Highways (NH), State Highways (SH), Major District Roads (MDR), Other District Roads (ODR), and Village Roads (VR) for the first time. The country's rural road system consists of the latter two classifications of roads. The Lucknow Plan (1981-2001), the third road development plan, proposed many approaches for rural road development. These approaches include developing a long-term Master plan for rural roads, building in stages due to the low volume of traffic in the early stages of a rural road's development, and integration of the rural road development plan with other rural development programmes. Rural roads have gotten a lot of attention and focus in all of the road development programmes. There was a widespread misunderstanding that rural roads, as the simplest type of road, did not require extensive design and engineering (Ramasamy, 2015). The Ninth Five-Year Plan recognizes that thousands of kilometres of such roads were built in the past without competent planning and engineering, and said that the resources assigned for the project were insufficient (Kumar & Bajiya,2017).As a result, rural roads had weak geometrics, inadequate embankment compaction, and inadequate drainage, making them far from all-weather roads. The road network in 2000 was 3.3 million kilometres long. Rural roads account for around 2.7 million

kilometres, or about 85 percent of the total. In the year of 2000, overall village accessibility was at 54%, however the situation in terms of accessibility to large habitations was substantially better (Loksha & Mahesha, 2017).

There is a growing body of evidence that relates transportation investment to improved poverty outcomes. If agriculture and industry are the body and bones of the economy, transportation and communication are the arteries and nerves that allow people and goods to circulate (Konch, 2014). According to a study conducted by the International Food Policy Research Institute on the links between government expenditure and poverty in rural India, a road investment of Rs. 10 crores (at 2009-10 prices) pulls 16,500 people out of poverty (Kale & Pimplikar, 2017)). Inadequate money was also a concern for maintaining, upgrading, and rehabilitating existing rural roads. A network approach was almost non-existent, as was the provision of long-term accessibility with guaranteed upkeep. Up until the start of the PMGSY, progress in rural road accessibility had been made as a result of road sector investments. Using India's road length of 31.03.2020, the country's road density is projected to be 1.80 km/100 sq km, which is comparable to Germany. The existing stock of road length in India was 58.98 lakh kilometres on March 31, 2017. National Highways (NH), State Highways (SH), District Roads, rural roads, Urban Roads, and Project Roads make up the country's road network, with the percentage share of each type of highway shown below (Basic Road Statistics, 2017).

**TABLE NO. 1. DIFFERENT CATEGORY OF ROADS IN INDIA**

Category Of Road	Length Of Roads (In Km)	% Share Total Road Length
National Highways (NHs)	1,14,158	1.94
State Highways (SHs)	1,75,036	2.97
District Road	5,86,181	9.94
Rural Road (Including JRY Roads)	41,66,916	70.65
Urban Road	5,26,483	8.93
Project Roads	3,28,897	5.58
<b>Total</b>	<b>58,97,671</b>	<b>100</b>

**Source:** Basic Road Statistics (2016-2017), GOI.

**DATABASE AND METHODOLOGY:**

Data will be collected from both primary and secondary sources for the present study. For assessing the connectivity status of both different states and districts of India and West Bengal, secondary data have been collected from Online Management, Monitoring and Accounting System (OMMAS), GOI (2021), National Resource Data Management System (NRDMS), Road Statistics (Ministry of Road Transport and Highway, 2018). Rural roads constructed under PMGSY schemes taken as a consider for measuring rural road connectivity. A state-by-state comparison of PMGSY road connectivity has been conducted to analyze connectivity status under PMGSY roads. Finally, rural road connectivity has been assessed using two road development indexes for both India and West Bengal state i.e., Rural Road density and Rural Road Availability. These two indexes were calculated based on available PMGSY roads data and other related data (area and population) and thematic maps were drawn to represents state wise and district wise PMGSY road connectivity of both India as well as state of West Bengal. The following formula being used to

calculate above mentioned indexes:

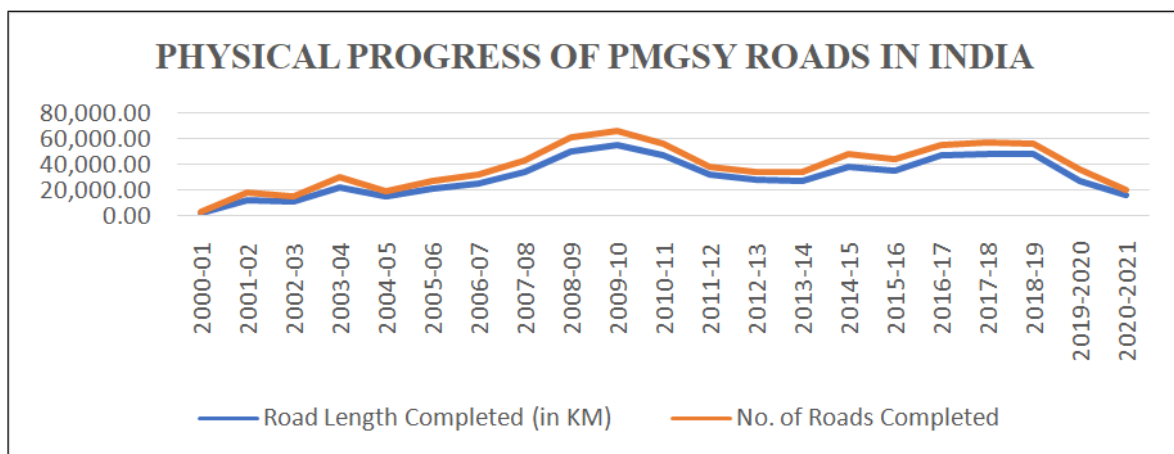
Rural Road Density (PMGSY) per 100 sq km = PMGSY road length/ Area\*100.

Rural Road Availability (PMGSY) per 100 persons = PMGSY road length / Total Population \*100.

**Progress of PMGSY Roads in India:**

The "Pradhan Mantri Gram Sadak Yojana" (PMGSY) was introduced in the year 2000, as a centrally supported programme and a one-time unique intervention as an effective alleviating poverty approach. The program's primary objective was to connect unconnected habitations in rural areas with populations of 1000 or more by 2003, and those with populations of 500 or more by 2007. The purpose in hilly/desert/tribal areas is to connect habitations with populations of 250 or more. PMGSY-II was begun in 2013 to upgrade selected Through Routes and Major Rural Links (MRLs) with a goal of upgrading 50,000 km in various states and Union Territories, in order to provide better service. Under the 12th Five Year Plan, Phase II of the programme is operational, but it is only available to states that have obtained all sanctions for new connectivity and up-gradation under PMGSY-I. The PMGSY-III aims to improve the current Rural Road Network by upgrading existing Through Routes and Major Rural Links that link habitations to Gramin Agricultural Markets (GrAMs), Higher Secondary Schools and Hospitals.

**Fig. 1. Year wise progress of rural roads under PMGSY.**

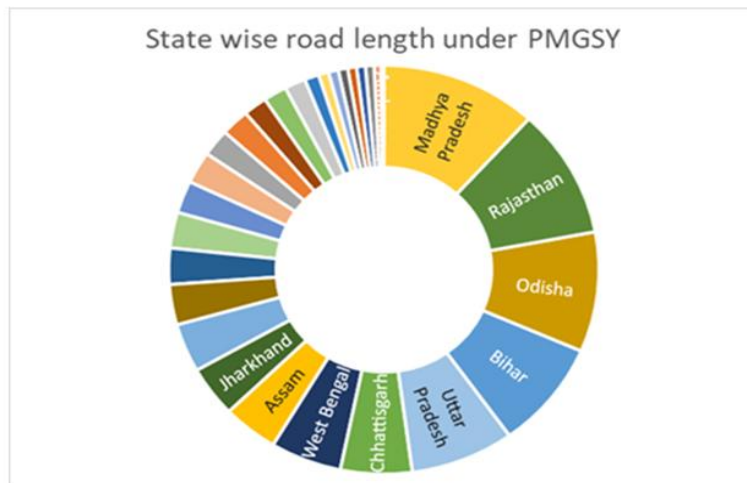


A total of 176732 roads were approved under the Pradhan Mantri Gram Sadak Yojana scheme. A total of 160705 roads have been finished under the sanctioned amount. According to the plan, the 176732 road spanned a total area of 738730.516 km<sup>2</sup>. In reality, PMGSY covered a total area of 642041.801k.m. during its whole operational span. In the field of new connection roads, the total number of roads sanctioned is 119431, and the total number of road works completed is 112243. UP-gradation road works were approved under PMGSY, and the total number of finished up-gradation roads is 48466. From the beginning of the scheme to the most recent accounting year, a total of 5,74,707.157 km of roads were built across India. The maximum number of completed roads was recorded in 2008-2009, and it gradually declined over time. The years 2009-2010 and 2008-2009 were placed first and second, respectively, in terms of total road length.

Except Delhi and Chandigarh, which are considered as metropolitan areas, PMGSY included practically every state and union territory in India. The government approved a total cost of just

1643059 for 90 roads in Goa, covering a total length of 182.740 kilometres, with no maintenance costs approved. The Indian union territory of Andaman and Nicobar Islands received the lowest number of roads, 70, covering a total area of 105.775 kilometres Madhya Pradesh has the most works (19,618) in the long run among 31 states, covering a total length of 75,952.506. Bihar has the highest sanctioned cost of \$3,099,943.00, whereas West Bengal has the highest maintenance cost of 121,747.42. Madhya Pradesh, Rajasthan, Odisha, Bihar, Uttar Pradesh, Chhattisgarh, West Bengal, Assam, and Jharkhand are the states where the completed road length under the PMGSY scheme is satisfactory.

Fig. 2. Share of rural road length in different states in India.



**Assessment of Rural Road Infrastructure under PMGSY in India:**

This section delves into rural India's road connectivity using two key road development parameters: rural road density and rural road availability. These two indicators have been deemed critical for assessing rural road development of India as well as West Bengal.

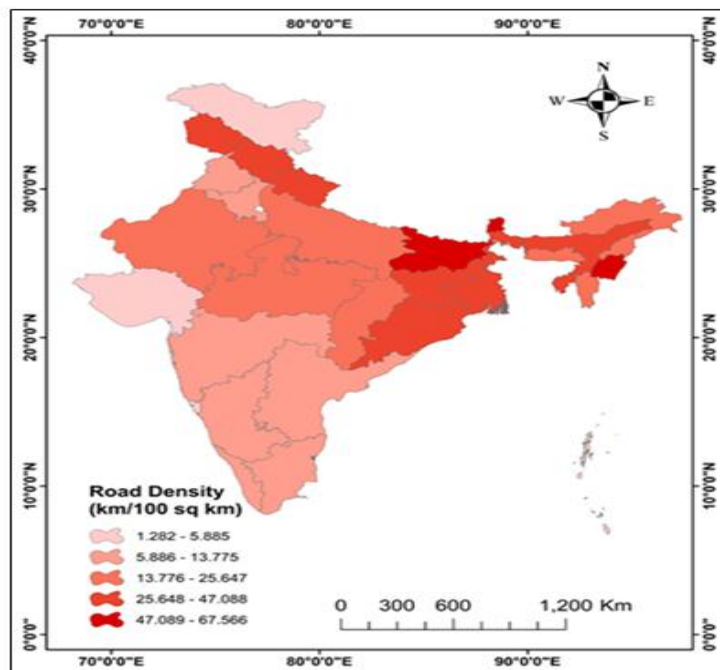
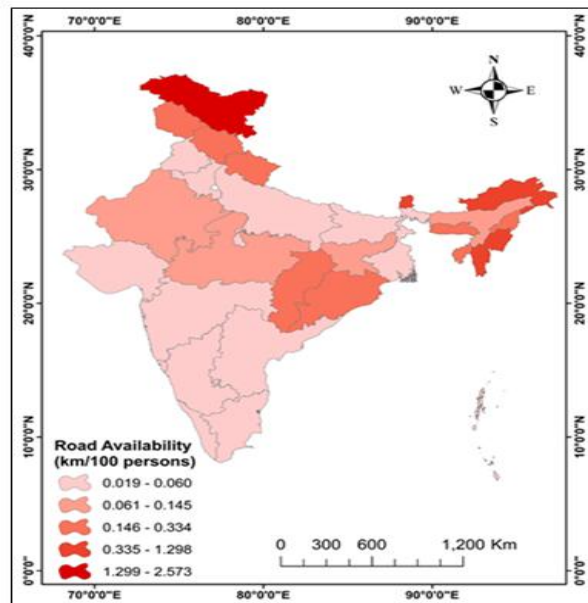


Fig. 3. Rural Road Density under PMGSY in India (km/100 km<sup>2</sup>)

PMGSY rural roads were given emphasis in this study for analyzing rural road development in the states. There is a strong variation of road density seen within the states. Sikkim (67 km/100sq.km) has the highest rural road density in terms of total PMGSY road length, followed by Bihar, Tripura, and Jammu & Kashmir, where the majority of rural roads were constructed under PMGSY. The states with the lowest rural road density are Andaman and Nicobar (1.2km/100sq.km), Ladakh (1.9km/100sq.km), and Goa (5km/100sq.km). It was discovered that the rural road density of newly formed states was quite low due to poor maintenance. A road is an important sign of a region's economic progress.

Fig. 4. Rural Road Availability under PMGSY in India (km/100 persons)



The availability of roads to the population is critical since rural commuters rely on transportation services. As a result, road availability has been identified as an important indication of road development. As described in the methodology, rural road availability is shown as rural road length in kilometres per lakh population in rural areas. In India, states show the variation in the distribution of road availability, Ladakh (2.6 km/100 persons), Arunachal Pradesh (1.3 km/100 persons), Sikkim (1.1 km/100 persons), and Mizoram (0.8 km/100 persons) have the highest value of road availability due to their low population density. States with the largest population have a very low quantity of PMGSY rural road availability since PMGSY roads only connect villages with the greatest numbers e.g., Uttar Pradesh (0.032 km/100 persons), Gujarat (0.033 km/100 persons), Haryana (0.028 km/ persons) etc. As a response, the emphasis should be on both the extension and maintenance of rural road length. The PMGSY scheme can help with rural road development because the scheme focuses primarily on rural road construction. The maps clearly shows that the majority of states have the lowest value of PMGSY road density. That is why the government should provide additional funds and maintenance costs to develop road infrastructure.

#### Assessment of Rural Road Infrastructure under PMGSY in West Bengal:

West Bengal is a state in northern India that stretches from the Himalayas in the north to the Bay of Bengal in the south. This state covers an area of 88,752 square kilometres, covering 2.7 percent of the country's total land area (Islam & Siddiqui, 2020). West Bengal has a population of 9.13 crore people with India's fourth-most populous and fourteenth-largest state by area (Census, 2011). West Bengal has the second-highest population density in India, after Bihar, with 1,029 people per square kilometers. According to the 2011 census, rural areas account for 68.11 percent of the state's population, while urban areas stand for 31.89 percent (Ghosh & Chakma, 2014). In

2018, West Bengal statistics totaled 204,688.000 km of roads. This is an increase from the previous year's total of 197,079.000 km. West Bengal data is updated yearly, with 15 observations averaging 169,922.000 km from March 2004 to 2018. The statistics set a new high of 204,688.000 km in 2018 and a new low of 21,251.000 km in 2005. The total length of rural roads constructed under the PMGSY scheme in West Bengal is 34,563 km, covering almost every district with measly difference. When compared to other districts, Birbhum and North 24 Parganas have the most completed PMGSY road length.

Fig. 5. Study Area.

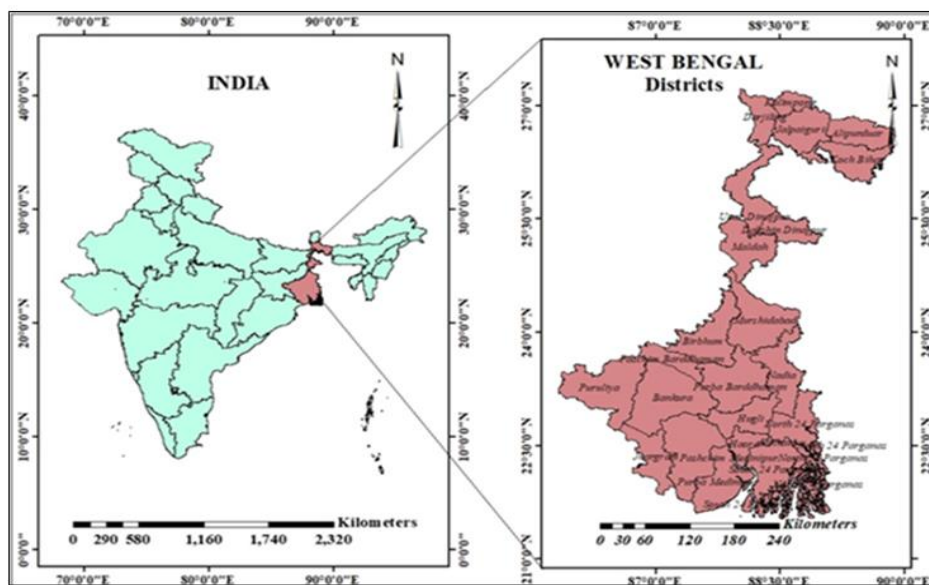


Table no. 2. District wise rural road density and rural road availability under PMGSY in West Bengal.

NAME OF DISTRICT	ROAD DENSITY (KM/100 PERSONS)	ROAD AVAILABILITY (KM/100 PERSONS)
ALIPURDUAR	20.1	0.057
BANKURA	45.8	0.096
BIRBHUM	49.4	0.073
COOCH BEHAR	37.0	0.049
DAKSHIN DINAJPUR	41.9	0.065
DARJEELING	83.2	0.155
HOOGLHY	48.3	0.045
HOWRAH	82.5	0.068
JALPAIGURI	33.2	0.096
JHARGRAM	55.4	0.154
KOLKATA	NA	NA
MALDA	38.0	0.041
MURSHIDABAD	38.5	0.036
NADIA	43.0	0.045
NORTH 24 PARGANAS	52.8	0.051
PASCHIM BARDHAMAN	17.2	0.005
PASCHIM MEDINIPUR	39.7	0.090
PURBA BARDHAMAN	24.8	0.033
PURBA MEDINIPUR	27.5	0.029
PURULIA	36.2	0.089
SOUTH 24 PARGANAS	16.9	0.028
UTTAR DINAJPUR	46.8	0.056

Source: Computed by Authors

The above table depicts that the PMGSY road density and road availability for each district in chronological order. The maps above clearly show that there is variability in the distribution of each indicator. Darjeeling (83 km/100 sq.km) has the highest rural road density in terms of total

PMGSY road length followed by Howrah (82 km/100 sq km), Jhargram (55 km/100 sq km), and North 24 parganas (53 km/100 sq km), where the majority of rural roads were constructed under PMGSY. The newly formed district such as Paschim Bardhaman (17 km/100 sq km), Alipurduar (20 km/100 sq km) have the lowest rate of rural road density as they have poor infrastructural infrastructure. Furthermore, South 24 Parganas (16 km/100 sq km) and Purba Medinipur (27 km/100 sq km) are districts with low rural road density because they are mostly occupied by urban areas. Likewise, road density, Rural Road availability of PMGSY roads also indicates the growth and development of rural roads built under PMGSY in West Bengal. Darjeeling (1.55km/100 persons) and newly formed Jhargram (1.54km/100 persons) districts are placed topped of the table of rural road availability under PMGSY in west Bengal. Districts like Purba Medinipur (0.029km/100 persons), Paschim Bardhaman (0.005km/100 persons) have the lowest amount of rural road availability as these districts have large amount of population respect to their areas.

Fig.6.Rural Road Density under PMGSY in West Bengal (km/100 km<sup>2</sup>)

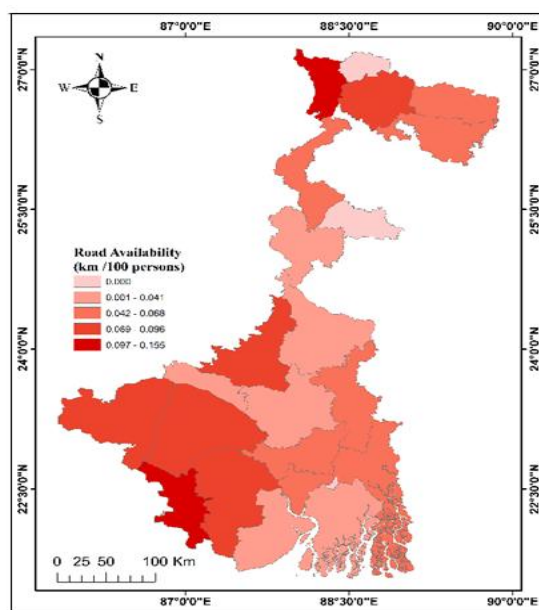
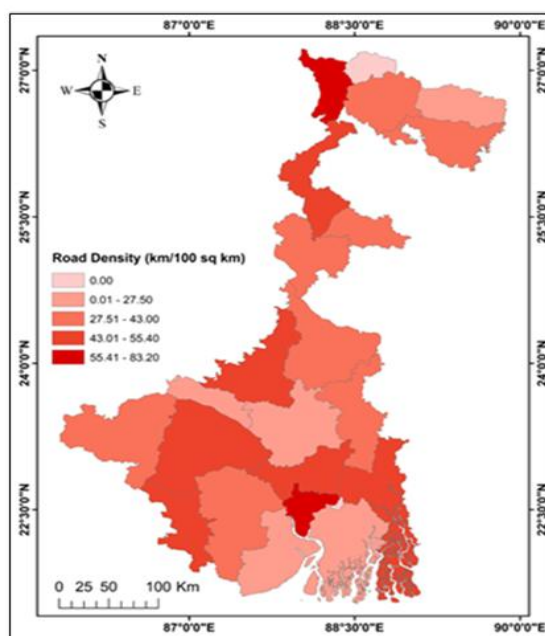


Fig. 7.Rural Road Availability under PMGSY in West Bengal (km/100 persons)



**CONCLUSION:**

The current study examined the connectivity status made under PMGSY scheme in India and concluded that, despite higher total rural road lengths in many states, PMGSY rural road development is very low, limiting people and goods mobility in rural areas. Rural roads are required in India for the development of both the area and the people. However, the PMGSY rural road initiative has begun developing all-weather roads to connect habitations that can be used by residents at any time of year, particularly in flood-affected areas. Though PMGSY aims to connect rural India via all-weather roads, many states are still far behind in terms of paved road connectivity. The study discovered that states with poorer rural road connection, rural road density, and road availability had lower levels of development in several states. As a result, the government should priorities rural road research and development of low-cost rural road building so that the objective of paved roads may be realized with the money available. Due to a shortage of money, many states were unable to meet their goals for rural road construction. As a result, with regard to the current state of PMGSY rural roads in India, the emphasis should be on appropriate planning and the construction of additional rural surfaced country roads.

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