

RURAL ROADS IN INDIA: AN OVERVIEW OF CONNECTIVITY STATUS

Ankita Medhi¹

ABSTRACT

Rural roads are important for connecting rural areas for better transport and communication and overall socio-economic development. Rural roads in India are important for overall rural development. The present study analyzes the rural road status in all the states of India till the year 2015. The study highlights the surfaced rural road connectivity in the states in India. The study states that though the overall length of the rural roads has been increased the surfaced road length has not been increased accordingly. Moreover, rural road development in all the states have been assessed through two important road development indicators. Road development indicators have depicted inadequate rural road development. The study suggested emphasis on both increase in rural road length and the surfaced roads. The study may provide the basis for planners in rural road development planning and maintenance.

Keywords: *Rural roads, rural road density, rural road availability, surfaced roads*

¹ Research Scholar, Department of Geography, Delhi School of Economics, University of Delhi, Delhi-110007

INTRODUCTION

Rural road connectivity is one of the important factors for rural development (MoRD 2004; MoRD 2007). Previous studies have proved that rural road investments have lifted the rural people above poverty line (Fan et al., 2000; Hettige, 2006). As about 68% of India's population lives in rural areas (GOI 2011), the rural roads are considered essential for enhancing socio-economic development in rural areas. According to Nagpur Road Development Plan of India (1943-1961) and Lucknow Road Development Plan (1981-2001), rural roads are the tertiary road system comprising Other District Roads and Village Roads (Sikdar 2000). Rural roads connect the villages with nearest market centres or any village and provides link to the main network. These roads are characterized by very low traffic volume, mainly consisting of vehicles such as cycles and animal drawn vehicles and pedestrians (Khanna and Justo, 2009; Sikdar 2000). Rural Roads in India include Panchayati Raj roads (ZillaParishad roads, Village Panchayat roads and Community Development roads) and roads constructed under JawaharRozgarYojana (JRY) and Pradhan Mantri Gram SadakYojana (PMGSY) programme (GOI 2015). There are two categories of roads based on the usage of the roads in different seasons of the year i.e. (i) all weather road¹ and (ii) fair weather roads (Khanna and Justo, 2009). Other types of roads based on the road pavement are (i) Paved road² and (ii) Unpaved road. And based on pavement surfacing the road types are (i) Surfaced and (ii) Unsurfaced road. All weather roads should be negotiable in all weathers, however, this does not necessarily imply that it should be paved or sealed or blacktopped (MoRD 2005). Therefore, all weather roads are essential for connecting areas for uninterrupted accessibility especially rural areas. Most of the rural roads in the developing countries are unpaved, earthen or gravel roads (Rao 2000). These unpaved roads become inaccessible during rainy season and people struggle commute to other places (Fukubayashi and Makoto 2014). Therefore, all-weather roads are essential in rural areas for accessing the required day to day activities and facilities. Paved or surfaced roads are more beneficial to the commuters than the unsurfaced roads. Paved or surfaced roads lead to many positive impacts on the rural people including increase in transportation facilities, increase in the frequency of transport services, accessibility to the facilities in town areas etc. To promote the use of public transport

the surfaced roads in rural areas are necessary. It is crucial to evaluate the connectivity status of the rural roads to provide database on rural roads in India and also

¹ All Weather Roads are those which are negotiable during all weather, except at major river crossings where interruption of traffic is permissible up to a certain extent are called all weather roads (Khanna and Justo, 2009; MoRD 2005)

² Paved Roads are roads with hard pavement at least Water Bound Macadam (WBM) road

³ Surfaced Roads are those which are provided with a bituminous or cement concreting surface (Khanna and Justo, 2009)

planning for maintenance of these roads. Detailed research on rural roads is required for better connectivity and rapid development of the rural areas.

Assessment of the level of connectivity in the rural areas is also essential. Road density and road availability are among the important development indicators (World Bank, 2007). According to Basic Road Statistics of India 2015 Report, road density in India is 1.66 km/sq.km of area which is higher than road density of Japan (0.91 km/sq.km), USA (0.67 km/sq.km), China (0.46 km/sq.km) and Brazil (0.18 km/sq.km) (GOI 2015). In addition, the surfaced road length in India was 61% of the total road length which was much lower as compared to United Kingdom (100%), Korea (82.5%), Russia (70.5%) and China (68%) (GOI 2015). The average road density of India per 100 sq. km of area was 164 km as on 31st March 2014 and 166 km as on 31st March 2015. The average road availability was 436 km/ lakh population for 2014 and 2015(GOI, 2015). As the road density is one of the development indicators, rural road development should also be considered to assess rural development. Therefore, specifically road density and road availability in rural areas should be considered as important rural development indicators. These indicators may focus the need for the development of rural roads. Rural road conditions can be assessed by road development indicators such as rural road density, rural road availability, and rural road connectivity etc. (Srinivasan 2000). Hence, these indicators should be utilized for assessing the rural road development in India leading to overall rural development. The present study attempts to show the rural road connectivity in all the states in India till the year 2015. The study also analyzed the surfaced rural road connectivity in India and in the states. Assessment of rural road development has been done based on important road development indicators.

DATA AND METHODOLOGY:

For the study primarily secondary data from different data sources has been used. Census of India (2011) data, Road Statistics (Ministry of Road Transport and Highways), government reports etc. have been used for the study. The rural road data includes above mentioned rural road categories. Rural road connectivity has been compared with other road categories in India. Comparative analysis of rural road connectivity has been done for the states. Both surfaced and unsurfaced categories of roads have been considered for analysis. Lastly, assessment of rural road connectivity has been carried out based on two road development indicators (i) Rural road density and (ii) Rural Road Availability (Srinivasan 2000). These two indicators were based only

on the rural roads and other relevant data (area and population). Census Data (2011) and road statistics data have been used for calculating both the indicators. Based on the road density and road availability indicators these two indicators have been formulated using the following formulas:

- (i) Rural Road Density = Rural Road Length per 100 sq.km of Rural Area
- (ii) Rural Road Availability = Rural Road length per Lakh Rural Population

RURAL ROAD CONNECTIVITY STATUS:

In this section, rural road development has been compared with the other categories of roads from 2009-2015 (Figure 1). Only the surfaced roads from all the road categories have been considered for comparison. Though rural roads have the highest share ⁴ the surfaced length of rural roads has not been increased accordingly. In the figure it is shown that the share of surfaced rural roads has been increasing at a very slow rate from 2009 to 2015.

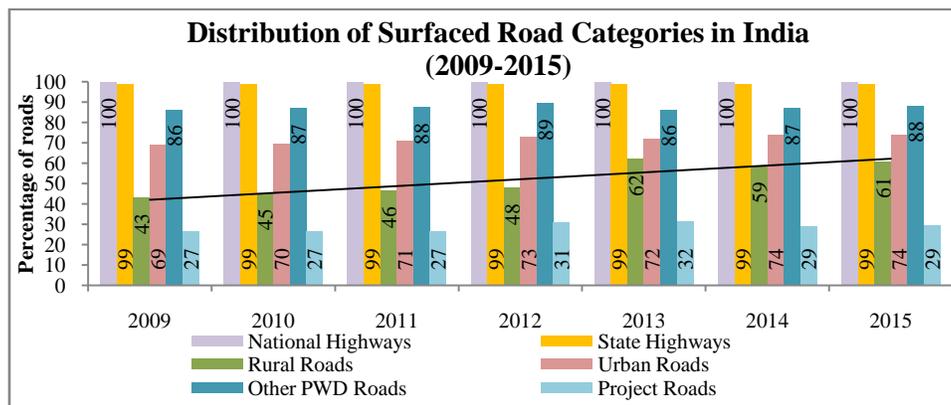


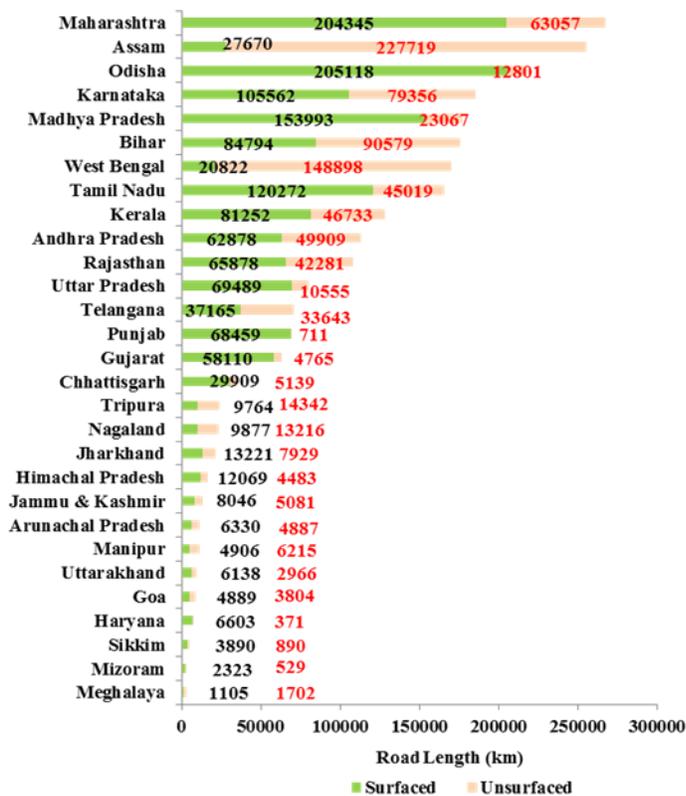
Figure 1: Surfaced Road Categories in India (2009-2015)

Along with the primary roads development such as National Highways (NH) and State Highways (SH) rural roads development is also important for overall development of the country. The state-wise length of rural roads in India has been analyzed and it has been found that many states have a considerable growth of road length in India till 2015 (Figure 2). Maharashtra and Assam have the highest rural road length according to 2015 data (Fig. 2). It can be stated that though Assam has second highest rural road length in 2015, the share of surfaced rural roads are lowest in Assam (11%) followed by the states West Bengal and Meghalaya.

⁴ Rural roads share 61% of the total road length in India followed by Urban Roads (8.5%), Project Roads (5.5%), State Highways (3.1%) and National Highways (1.8%) (GOI, 2015)

According to the analysis Sikkim (81%) has the maximum share of surfaced rural roads among the North Eastern (NE) states. From the inter-state comparison it can be seen that only four states Punjab, Haryana, Odisha and Gujarat have more than 90% surfaced roads. It can be drawn that though total length of rural roads higher in some states the surfaced roads are not increasing accordingly. Seven states including five states from North East India have below 50% surfaced roads. The rural people in most of the states in India face problems in accessing the facilities and commuting during Monsoon. In Assam which has the lowest percentage of surfaced roads the rural roads are affected by floods. During monsoon, rural people are unable to access important facilities such as schools, health care due to severe condition of the unsurfaced roads. Therefore, the surfaced road development specifically in rural parts in India is necessary to provide accessibility all the year so that people could access the facilities during rainy season.

State wise Rural Road Length (2015)



Sl. No.	State	Rural Roads (in Percentage)	
		Surfaced	Unsurfaced
1	Assam	11	89
2	West Bengal	12	88
3	Meghalaya	39	61
4	Tripura	41	59
5	Nagaland	43	57
6	Manipur	44	56
7	Bihar	48	52
8	Telangana	52	48
9	Andhra Pradesh	56	44
10	Goa	56	44
11	Arunachal Pradesh	56	44
12	Karnataka	57	43
13	Rajasthan	61	39
14	Jammu & Kashmir	61	39
15	Jharkhand	63	37
16	Kerala	63	37
17	Uttarakhand	67	33
18	Tamil Nadu	73	27
19	Himachal Pradesh	73	27
20	Maharashtra	76	24
21	Sikkim	81	19
22	Mizoram	81	19
23	Chhattisgarh	85	15
24	Uttar Pradesh	87	13
25	Madhya Pradesh	87	13
26	Gujarat	92	8
27	Odisha	94	6
28	Haryana	95	5
29	Punjab	99	1

Figure 2: State wise rural road length in India (2015)

ASSESSMENT OF RURAL ROAD DEVELOPMENT:

In this section road connectivity in rural India has been investigated in detail through two important road development indicators (i) Rural road density and (ii) Rural Road Availability. These two indicators have been considered important for assessment of rural road development. In this study surfaced rural roads has been given significance for assessing the rural road development in the states.

The rural road density in the states in India has shown variability. Both total and surfaced rural road density have been shown in the table (Table 1). Kerala (410km/100sq.km) has the highest rural road density in terms of total road length followed by Goa where rural population is lower than urban population. In terms of surfaced roads Kerala (260km/100sq.km) again has the maximum road density. Maharashtra where total road length is highest has only rural road density of 90km per100 sq.km. The difference between total roads and surfaced roads is different in most of the states. It can be stated that surfaced rural road density in many states are very less as compared to total road density. Jammu and Kashmir (5km/100sq.km), Meghalaya (13km/100sq.km) and Mizoram (14km/100sq.km) have the lowest rural road density among all the states. It can be observed that density of rural roads in Meghalaya and Mizoram is lower due to lower road length.

The road availability to the population is very essential as it is the rural commuters who utilize the transportation services. Therefore, road availability has been considered as significant road development indicator. As discussed in the methodology the rural road availability has been shown as rural road length in km per lakh population in rural area. The availability of roads has shown similar results for the states. The surfaced rural road availability of the states has shown inadequate results. Most of the states have very less surfaced roads resulting in low surfaced rural road availability. Nagaland and Arunachal Pradesh have occupied the first two ranks. In the surfaced road category Goa and Sikkim are the two top ranked states among all the states in India. In Haryana the road density and road availability very low despite of higher percentage of surfaced roads. Therefore the focus should be both on road length and surfaced roads.

From the analysis it can be stated that both rural road density and road availability have not shown considerable growth in most of the states. The states in India have to accelerate the development of rural roads particularly surfaced roads for better accessibility.

Table 1: Rural Road Development Indicators

Sl. no	State	Rural Road Density (km/100sqkm)	Surfaced Rural Road Density (km/100sqkm)	Rural Road Availability (km/lakh Population)	Surfaced Rural Road Availability (km/lakh Population)
1	Andhra Pradesh	42	24	200	112
2	Arunachal Pradesh	NA*	NA*	1052	594
3	Assam	331	36	953	103
4	Bihar	191	92	190	92
5	Chhattisgarh	27	23	179	153
6	Goa	299	168	1576	886
7	Gujarat	33	31	181	167
8	Haryana	17	16	42	40
9	Himachal Pradesh	30	22	268	195
10	Jammu and Kashmir	6	4	144	88
11	Jharkhand	27	17	84	53
12	Karnataka	100	57	494	282
13	Kerala	410	260	733	465
14	Madhya Pradesh	59	51	337	293
15	Maharashtra	90	68	434	332
16	Manipur	50	22	641	283
17	Meghalaya	13	5	118	47
18	Mizoram	14	11	543	442
19	Nagaland	141	60	1641	702
20	Odisha	143	135	623	587
21	Punjab	145	143	399	395
22	Rajasthan	32	20	210	128
23	Sikkim	68	55	1046	851
24	Tamil Nadu	142	103	444	323
25	Tripura	239	97	889	360
26	Uttarakhand	17	12	129	87
27	Uttar Pradesh	34	30	52	45
28	West Bengal	203	25	273	33

*Rural area data was not available for Arunachal Pradesh

CONCLUDING REMARKS:

The current study discussed the status of rural roads in India and stated that despite of higher total rural road lengths in many states the surfaced road development is very low which can restrict the mobility of people and goods in rural areas. In India the rural roads are mandatory for development of area as well as the people. The earlier road development plans in India concentrated on increasing the length of the roads in areas irrespective of the type of roads. However, PMGSY rural road programme has started constructing all-weather roads to

connect the habitations which can be accessed by the people any time of the year especially in case of flood affected areas. Though PMGSY has aimed at connecting the rural India by all-weather roads, many of the states are still a way behind of surfaced road connectivity. The study found that the states where rural road connectivity is lower and rural road density and road availability showed lower level of development in many states. Hence, the government should put emphasis on rural road research and development of low cost rural road construction so that the goal for surfaced roads could be met with the available funds. Many of the states could not attain the goals for construction of rural roads due to lack of funds. Therefore, with respect to the present scenario of rural roads in India the focus should be on proper planning and constructing more surfaced rural roads.

REFERENCES:

- Fan, S., Hazell P. & Thorat, S. (2000). Government Spending, Growth, and Poverty in Rural India. *American Journal of Agricultural Economics*, 82 (4): 1038–51
- Fukubayashi Y. and Makoto K. (2014). Improvement of rural access roads in developing countries with initiative for self-reliance of communities, *Soils and Foundations* 54(1):23–35
- Government of India (GOI). (2011). Census of India 2011
- Government of India (GOI). (2015). *Basic Road Statistics in India 2013-14 and 2014-15*. Ministry of Road Transport and Highways
- Hettige H. (2006). *When do rural roads benefit the poor and how: An In-depth Analysis Based on Case Studies*, Asian Development Bank
- Khanna S.K. and Justo C.E.G. (2009). *Highway Engineering*. Roorkee, India: Nem Chand and Brothers
- Ministry of Rural Development (MoRD). (2004). *PMGSY Schemes and Guidelines*. Retrieved from <http://www.pmgysy.nic.in/pmg31.asp>
- Ministry of Rural Development (MoRD). (2005) *Pradhan Mantri Gram Saadak Yojna Operations Manual*. National Rural Road Development Agency

Rao P.J. (2000). *Maintenance of Rural Roads Problems and Prospects*. Retrieved from <http://pmgsy.nic.in/pmg9103.asp>

Sikdar P.K. (2000). *Rural Road Network Planning using GIS*. Retrieved from <http://pmgsy.nic.in/pmg981.asp>

Srinivasan N.S. (2000). *Planning of Rural Roads*. Retrieved from <http://pmgsy.nic.in/pmg9117.asp>

World Bank. (2007). *World Development Indicators*. Washington DC: World Bank