

Development of Rural Road Infrastructure in India

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Abstract

As per the 2011 census, rural areas account for 69 percent of India's total population. Therefore, improved connectivity and accessibility to rural areas will provide a vital impetus to the country's economic growth. Development of rural infrastructure in general and rural transport infrastructure in particular is very crucial in India. Rural road connectivity ensures access to critical services and opportunities, and fosters sustainable poverty reduction programs as well as employment generation through industrialization in rural areas. It is estimated that 20-30 percent of the agricultural, horticultural and forest produce gets wasted because of either inadequate rural road network or poor condition of roads, which creates an impedance for transporting such commodities for the user needs. Rural road accounts for 60 percent of the total road length in India. While the total rural road length was only 3,54,530 kilometres in 1970-71, it has increased to about 24,50,559 kilometres in recent times. These statistics corroborate the importance given to the development of rural roads as part of the overall development of the country. Furthermore, research suggests that public investment in infrastructure, specifically in the rehabilitation of rural roads, improves local community and market development. Studies on rural road development in several countries reported rise in male agricultural wages and aggregate crop indices (Bangladesh), increase in the availability of food, the completion rates of primary school and the wages of agricultural workers (Vietnam), etc. However, studies on Indian rural roads are almost non-existent. Against this backdrop, the present study analyses some past trends and present practices related to rural transport in India. In addition, the study investigates the impact of rural road infrastructure development on socio-economic conditions of the rural population including the overall contribution to the nation.

Keywords:

Rural Infrastructure, PMGSY, Bharat Nirman, RIDF

Introduction

Availability of adequate infrastructure in rural as well as urban areas is the *sine qua non* for economic development of a nation. Access to rural infrastructure has a strong positive association with rural economic development and strong negative association with incidence of poverty. It is necessary to accelerate investment in rural infrastructure to generate additional employment, create new economic opportunities, ensure delivery of related services and enhance credit absorption. All these ultimately lead to improvement in quality of life and reduce the vulnerability of rural poor.

Rural Connectivity is a key component of rural development and contributes significantly in the socio-economic development of rural people by providing access to amenities like education, health, marketing etc. It has been established that investments in rural roads lifts rural people above the poverty line. The evidence also indicates that as the rural connectivity improves, the rural poverty levels come down. Improved roads can create opportunities for economic growth and poverty reduction through a range of

mechanisms. Roads reduce transportation costs and the costs of consumption and production of goods and services. With easier access to markets and technology, improved roads expand farm and non-farm production through increased availability of relevant inputs and lower input costs (Binswanger, Khandker, and Rosenzweig, 1993; Levy, 1996). At the household level, road development contributes to higher productivity and demand for labour (World Bank, 2000), and improved education and health, including those for women and girls (Bryceson and Howe, 1993; Levy, 1996). The importance of infrastructure in agriculture and rural development is well documented. It is estimated that 15 percent of crop produce is lost between the farm gate and the consumer because of poor roads and inappropriate storage facilities alone, adversely influencing the income of farmers (World Bank, 1997).

Construction of rural roads inevitably leads to increase in agricultural production and productivity by bringing in new land into cultivation or by intensifying existing land use to take advantage of expanded market opportunities. In addition to facilitating agricultural commercialization and

diversification, rural infrastructure, particularly roads, consolidates the links between agricultural and nonagricultural activities within rural areas and between rural and urban areas (IFAD, 1995)

Review of Literature

Numerous studies have established the positive relationship between rural connectivity and development; rural roads provide vital links that foster effective access to and utilization of a host of important social and physical infrastructure. A multitude of benefits are attributed to rural road development, including increased agricultural production, better farm prices, growth of dairying, rural industrialization, better educational standards, and higher life expectancy resulting in balanced and faster development of rural areas.

Rural road development enhances access to markets for both inputs and outputs through a reduction in transaction and trade cost (transport and logistics cost). The greater availability of inputs increases their use by farmers. Consequently, agricultural productivity can increase. Rural roads also allow producers to achieve additional productive opportunities, leading to rise in production (Stifel and Minten, 2008). Jalan and Ravallion (2002) show that road density had a highly significant positive effect on consumption growth at the farm-household level in rural areas of Southern China from 1985 to 1990. Using household data in Ethiopia, Dercon and others (2008) find that the proximity of a road is a major factor in reducing poverty. Fan, Nyange, and Rao (2005) shows that each kilometer reduction in the distance to a public transportation facility reduces the probability of a household being poor by 0.22 to 0.33 percent in Uganda.

It has been observed that there was a direct relationship between increase in acreage of export crop cultivation and the standard of roads and distance from main commercial centers. There is enhanced entrepreneurial activity, sharp decline in freight and passenger charges and improved services as a result of investment in rural roads (Bonney, 1964). While analysing the socio-economic impact of new roads on small and isolated village communities in Mexico, it was found that the roads created inflow and outflow generation of transportation, communication and modernisation as well as migration, both into and out of the community. (Elmondorf and Merrill, 1977).

The study of the effects of rural roads improvement in the Philippines revealed improved economic social and human services indicators, as a result of improvement in rural roads. The gross household income increased by 28 percent primarily due to cheaper and more reliable transport, cheaper farm inputs, higher farm gate prices and large share

of major crops sold directly in markets. There was increased non-farm employment, better access to education, health and farm management services, improved recreation facilities and information flows (USAID, 1978). Access to better health and education usually improves more rapidly along roads than elsewhere. A study in Thailand revealed that impact of roads was more on isolated areas that were brought into the mainstream. The area under cultivation and the intensity of land use increased significantly wherever access to market is improved (Moore, 1980).

In another study, macro data was used from eighty five random selected districts of India to examine the role of rural roads, among other factors in agriculture investment and output. The study found that the road investment contributed directly to the growth of agriculture output, increased use of fertiliser, expansion of commercial bank operations etc (Binswanger, Khandker and Rosenzweig, 1993). The study by IFPRI on a survey of 129 villages in various parts of Bangladesh categorised the villages into two groups based on an aggregate index developed to reflect the ease and access of a village to various services such as markets, schools, banks and local administrative offices. Villages with better access were found to be significantly better off in a number of areas including agricultural production, household income, wage income of landless labour, health and participation of women in the economy (Ahmad and Hossain, 1990). Access to all-weather roads in 15 villages in Ethiopia reduced the incidence of poverty by 6.7% (World Development Report of World Bank, 2008).

Rural Roads Infrastructure in India

The necessity of a proper road network for the socio-economic development of rural India and consequently the whole country was understood quite early in India. The first road development plan of 1943-61, popularly known as Nagpur Plan, looked at the road needs of the country on a long-term basis, and for the first time classified the road system into a functional hierarchy comprising National Highways (NH), State Highways (SH), Major district roads (MDR), Other District roads (ODR) and Village roads (VR). The last two classes of roads form the rural road system in the country. The third road development plan known as Lucknow Plan (1981-2001), estimated rural road requirement for the country and had spelt out various measures to develop rural roads. This plan suggested several approaches for rural road development. These approaches include preparation of long-term master plan for rural roads; stage construction in view of the low level of traffic in the initial stage of development of a rural road; integration of rural road development plan with the other rural development programs.

During all the road development plans the rural roads have received significant attention and emphasis. A number of programs were launched under several employment generation and poverty alleviation programmes of the Central and State Governments to achieve the goal of rural connectivity such as the Minimum Needs Program (MNP), National Rural Employment Program (NREP), Rural Landless Employment Guarantee Programme (RLEGP), Jawahar Rozgar Yojana (JRY) etc.; but these programmes failed to achieve their desired goals. A pragmatic analysis of the past schemes reveals many deficiencies in the whole process from planning to implementation and monitoring to evaluation. There was largely a misconception that rural roads being the lowest category of roads need no elaborate design and engineering. The Ninth Five Year Plan acknowledges that several thousand kilometers of such roads were constructed in the past without proper design and engineering and hardly commensurate with the resources that were allocated to the effort. As a result, rural roads had poor geometrics, inadequate compaction of embankment and inadequate drainage, so the roads that were built were hardly all-weather roads. Consequently, these roads did not last long.

Pradhan Mantri Gram Sadak Yojana (PMGSY)

In order to create durable and permanent assets, an adequate provision for drainage and protection works as well as quality control during construction and maintenance of assets, Government of India launched the Pradhan Mantri Gram Sadak Yojana (PMGSY) on 25th December, 2000 as a Centrally Sponsored Scheme to assist the States. The primary objective of PMGSY is to provide connectivity by way of an All-Weather road (with necessary culverts and cross-drainage structures, which is operable throughout the year), to the eligible unconnected habitations as per Core-Network with a population of 500 persons (as per 2001 Census) and above in plain areas. The current source of

funds for PMGSY works is cess on High Speed Diesel (Rs. 0.75 / litre), budgetary support, ADB funding, World Bank funding and NABARD loan. Table 1 details the release of funds from 2000-2001 to 2013-14. A total amount of Rs. 1,11,368 have already been spent under this program including funding from World Bank and Asian Development Bank.

It is increasingly essential to ensure that roads already created are systematically maintained and yield services as originally envisaged before going on undertaking more such assets. Keeping in view the asset value of the road network, PMGSY-II has been launched. The programme was conceived on sharing basis to consolidate existing rural road network by up-gradation, renewal and maintenance of the vast network already created. It would cover up-gradation of existing selected rural roads based on a criterion to make the road-network vibrant. The selection of routes would be with the objective of identification of rural growth centres and other critical rural hubs, rural places of importance (connectivity to other growth poles, market, rural hub, tourist places etc.). Development of Rural Hubs & Growth Centres is crucial to the overall strategy of facilitating poverty reduction through creating rural infrastructures. Growth centres / rural hubs provide markets, banking and other service facilities enabling and enhancing self-employment and livelihood facilities. It is proposed to cover during the 12th Five Year Plan period, overall 50,000 km road length by up-gradation to consolidate the rural road Network under the PMGSY-II programme at an estimated cost of Rs. 33,030 crore (at 2012-13 prices), including administrative and management cost of Rs. 530 crore. The cost will be shared between the Centre and States/Uts on 75:25 basis for the plain areas and 90:10 basis for the special areas. The Central share would be Rs. 27,022 crore (at 2012-13 prices), including administrative and management cost of Rs.530 crore.

Table 1 :
Release of Funds under PMGSY to the States (2000-2001 to 2013-14)

Sr. No.	Year(s)	Release for Programme	Release for Admn. Fund	Release under ADB Assistance	Release under World Bank Assistance	Total Release
1.	2000-01	2,435	0	-	-	2,435
2.	2001-02	2,493	7	-	-	2,500
3.	2002-03	2,497	3	-	-	2,500
4.	2003-04	2,299	26	-	-	2,325
5.	2004-05	2,111	37	93	220	2,461
6.	2005-06	3,770	40	193	218	4,221
7.	2006-07	4,415	100	1000	750	6,265

8.	2007-08	3,834+4,500*	66	1,950	650	11,000
9.	2008-09	5,380+7,500*	151	2,000	250	15,281
10.	2009-10	10,390+6,500*	140	800	10	17,840
11.	2010-11	21,325	185	800	90	22,400
12.	2011-12	10,598	83	1075	627	12,383
13.	2012-13	3,272	125	425	575	4,397
14.	2013-14	4,553	164	-	643	5,360
Total		97,872	1127	8336	4033	1,11,368

*From NABARD as loan

Source: Annual Report 2013-14, Ministry of Rural Development, Govt. of India

Table 2 :
Physical Progress of PMGSY up to March 2014 (PMGSY I, II and ADB/WB)

(Rs. In Crore, Length in Km.)

Amount Released as project cost	No. of Road works completed	% Completed road works	Length of road works completed	% Length completed
1,09,589	1,01,999	71	3,99,911	73

Table 3 :
The Targets of the Programme and Present Progress as on 31st March, 2014

Activity	Total Eligible	Projects Cleared (Sanctioned)	Achievement
PMGSY-I			
Habitations (in Nos.)	1,78,184	1, 44,717 (81%)	97,838 (55% of eligible)
New Connectivity (km.)	-	3,58,411	2,48,919 (70% of sanctioned)
Upgradation Length (Km)	2,24,906	1, 75,326 (78%)	1,51,060 (67% of eligible UG)
PMGSY-II			
Upgradation Length (Km)	50,000	10,725 (21%)	Nil

Source: Annual Report 2013-14, Ministry of Rural Development, Govt. of India

Bharat Nirman

Bharat Nirman, one of the important Programmes launched by the Government of India in December 2005 identified six core infrastructure sectors in rural areas viz rural housing, irrigation, drinking water, rural roads, rural electrification and rural telephone connectivity. Initially, it was launched as a time bound programme of construction of rural infrastructure for implementation during the four year period 2005-09. Rural Road, one of the six components of the program with a goal to provide with an all-weather road

connectivity to all eligible unconnected habitations with a population of 1,000 persons and above (as per 2001 census) in plain areas and 500 persons and above in the case of Hilly or Tribal (Schedule V) areas. The Bharat Nirman Programme envisages a massive scaling up in terms of habitation connectivity coverage, construction targets, and financial investment. Up to March, 2014 a total of 51,253 habitations have been connected out of 63,940 habitations to be connected and works for connecting 62,876 habitations have been sanctioned. The targets and achievements of rural road network under Bharat Nirman are given in Table 4.

Table 4 :
Year-wise Targets and Achievements of Rural Road Network under Bharat Nirman

Year	Target		Achievement	
	No. of Habitations to be connected	Length of road works to be completed (in Km.)	No. of Habitations connected	Length of road works completed (in Km.)
2005-06	7,895	17,454	8,202	22,891
2006-07	9,435	27,250	10,801	30,710
2007-08	12,100	39,500	11,336	41,231
2008-09	18,100	64,440	14,475	52,405
2009-10	13,000	55,000	7,877	60,117
2010-11	4,000	34,090	7,584	45,109
2011-12	4,000	30,566	6,537	30,995
2012-13	4,000	30,000	6,864	24,161
2013-14	3,500	27,000	6,560	25,316

Source: Annual Report 2013-14, Ministry of Rural Development, Govt. of India

Challenges of Developing Rural Road infrastructure

India has a rural road length of about 2.7 million km which is about 80 per cent of the total road network. The serviceable condition of this is crucial to the rural / agricultural growth and affording means of access to millions of rural people to social facilities viz. medical, education as also to market. Lack of maintenance affects the poor people badly as the time for access to markets and other social infrastructure is increased. Hence, the challenge lies in both expansion of the network to provide road links to unconnected habitations and at the same time maintenance of the existing vast rural road network built at huge cost to the economy over the past over fifty years. The Thirteenth Finance Commission (FC) has specifically made provision for maintenance funds for the core rural roads network including for PMGSY roads that have completed their initial five-year maintenance contracts. Among several issues to be addressed for ensuring maintenance of rural roads on sustainable basis, the most critical one are need for Government Policy, dedicated funds, maintenance backlog, linkage to initial construction, Maintenance Management System, institutional reforms, contract maintenance, Panchayati Raj Institutions, modernization, experience sharing etc.

Financing the Rural Road Infrastructure

Rural roads often receive the least attention in the network. This is because they are funded from a number of sources, at national regional and local levels. Similarly, they are managed with inputs from central, regional and local governments, and are situated at the intersection of transport, agriculture and local government mandates. They

are treated sometimes as economic, sometimes as social investments. The Constitution of India limiting the Government's availment of adequate resources for financing rural infrastructure. The competing demands on budgetary resources and the limitations on borrowing from the market reduce the capability of State Governments to adequately fund rural infrastructure. More over the capacity of the government machinery to execute and deliver infrastructure projects in rural areas is limited in many States. It is thus clear that public sector resources will continue to fall short of the required infrastructure investments in the rural areas. Therefore, there is a need to look at private sector investments to supplement governmental resources. In order to encourage the private sector to join hands with the State machinery to provide and maintain infrastructure in rural areas, innovative funding methods including the PPP mode, annuity payments, viability gap funding, etc., need to be developed and implemented.

Rural Infrastructure Development Fund (RIDF)

Conventionally, public investment is considered as the major provider of rural infrastructure. It has enabling and encouraging effect on the private investment in agriculture. Lack of public investment in infrastructure influences the viability and effectiveness of private investment in a negative manner. However, it has not been possible to step up public investment in a big way. To address this concern, Government of India, instituted Rural Infrastructure Development Fund (RIDF) in 1995 in NABARD, entrusting it with the responsibility of channelising financial resources to the State Governments for rural infrastructure

development. Since inception of RIDF, around 5.37 lakh projects involving an amount of Rs. 1,84,107 crore were sanctioned under various tranches. Out of the cumulative RIDF loans sanctioned as on 31 March 2014, agriculture and related sectors accounted for 43 percent (including 29 percent for irrigation), rural roads 31 percent and bridges 12 percent. The balance 14 percent of the loans was sanctioned

under social sector projects. The sector-wise position is presented in Table 5. The RIDF investments have resulted in multitude of benefits including, creation of additional irrigation potential of 218.4 lakh, provision of rural connectivity through 3.8 lakh km. rural road network and 8.8 lakh meters long rural bridges.

Table 5 :
Sector-wise Projects and Amounts Sanctioned under RIDF I to XIX
(as on 31 March 2014)

Sector	No. of Projects	Share in Total (%)	Amount Sanctioned (Rs crore)	Share in Total (%)
Rural Roads	1,03,046	19	57,606.92	31
Social Sector	1,00,372	19	26,134.23	14
Irrigation	2,73,475	51	53,613.57	29
Rural Bridge	17,446	3	22,268.95	12
Agriculture related	42,442	8	24,482.87	14
Total	5,36,781	100	1,84,106.54	100

Source: NABARD Annual Report, 2013-14

Conclusion

Rural roads are the wealth of a nation, a tool for social inclusion, economic development and environmental sustainability. Rural roads link communities and their agricultural fields to the main transport system and markets. Improving rural roads reduces transport cost and stimulates marketing. This results in increased production and productivity, crop diversification and increased profitability. A main bottleneck for local economic development is often a limited and poor quality rural road network. It is quite evident from the Plan documents that, private sector participation in road sector has been confined to development, maintenance and operation of specified highways (national and state), expressways, bridges and bypasses. Rural roads, particularly, those needed to link remote, hilly and backward settlements are hardly *profitable* to the private operator. Hence, without doing any major policy revamp on the development of rural road infrastructure, it is very difficult to expect private sector participation in this area and till that time Public investment must have to come in a big way and without any further delay. This crucial component of rural infrastructure, neglected during the reforms decade, need to be state financed in a time bound manner to prevent the rise in urban-rural disparities in growth and development.

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