



Research Paper

Economic Benefits of Road Infrastructure on Agricultural Development and Rural Road Infrastructure Development Programmes of India and Karnataka

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ABSTRACT: Agriculture continues to be a main stay of life for majority of the population in India. which contributes around 17.5 per cent (Economic survey 2015-16) of the GVA; About 68.84% people are living in rural areas (Census 2011) and directly or indirectly they are still dependent on Agriculture. About 43% of India's geographical area is used for agricultural activity and employs 53 per cent of the workforce in the country. Since the responsibility of providing infrastructure is with the state which aims at accelerate the growth of agricultural production for attaining the developmental goals such as poverty alleviation, relieving unemployment, attaining food security and promote industrial development etc.,. Therefore, transport network is one of the most significant factors of all physical infrastructures. While the demand for expansion of transport generally derives from the needs of the other sectors of the economy, to an extent, the road transport sector also acts as a leading factor in stimulating socio-economic development. From the rural perspective, among the different modes of transportation road transportation is the most important transport infrastructure in the country. Road infrastructure provides the basic transport infrastructure in rural areas for bringing the majority of the people who are living in far-off villages into the mainstream of the economy. Development of rural infrastructure is imperative for agriculture and overall economic growth as also uplift the quality of life. Realising the conscious need for creation of basic infrastructure to support agriculture, production, transport, marketing and other allied activities Government of India has started some programmes to improve rural road infrastructure.

Keywords: Road Infrastructure, Agriculture Production, Rural connectivity.

I. INTRODUCTION

The agricultural sector is one of the most important components of Indian Economy. Agriculture continues to be a main stay of life for majority of the population. Which contributes around 17.5 per cent (Economic survey 2015-16) of the GVA; About 68.84% people are living in rural areas (Census 2011) and are still dependent on Agriculture. About 43% of India's geographical area is used for agricultural activity and employs 50 per cent of the workforce in the country. Therefore the responsibility of providing infrastructure is with the state which aims at rapid growth of agricultural production for attaining developmental goals such as attaining food security, promote industrial development, relieving unemployment, and poverty alleviation etc.,. The agricultural sector in our country has prosperous over the years because of government's constant thrust on increasing agricultural production. Still the benefits are not percolating down to the farming community. Indian agriculture is characterized by lack of proper infrastructure facilities.

The nature of infrastructure is concerned, there are several kinds of infrastructure such as economic infrastructure, financial infrastructure, technological infrastructure, social infrastructure, agricultural infrastructure, etc., defined in broader terms. Among the infrastructures mentioned above, agricultural infrastructure plays a significant role especially in a developing country context where a larger percentage of poorer section of the society depends on this sector for subsistence. The agriculture sector continues to be one of the largest occupation as it still provides livelihood to around 50percent of the population. The enhancing infrastructure warrants a closer relationship with the levels of agricultural development. This assumes importance because, the agricultural sector plays a major role in reducing poverty and the growth of the agricultural sector and its components such as growth of agricultural output, income, employment, etc depend

largely on the level of investment made in infrastructure. In other words, level of infrastructure in agricultural sector is one of the important factors that could explain the agricultural growth. This being our major objective is to analyze the role of infrastructure in development of agricultural.

Rural road infrastructure is an important components of agricultural infrastructure. One of the major constraints to development of agriculture in India has been the lack of all-weather village to market roads. A majority of villages still lack road links with market towns and with one another. Road improvement would contribute to a decline in both average and marginal costs of production by encouraging the use of more productive inputs and farming techniques also by reducing the costs of holding inventory of inputs and of procuring inputs from the market. Improved communication and inability provided by all weather roads would expose farmers to modern agricultural practices.

Review of Literature:

At present there are many research based literatures have attempt to deal with effects of road infrastructure on agriculture.

According to Wharton (1967) agricultural infrastructures are categorized into [i] capital intensive, like irrigation, roads, bridges [ii] capital extensive, like extension services and [iii] institutional infrastructure, like formal and informal institutions. Infrastructure, such as irrigation, watershed development, rural electrification, roads, markets, in close coordination with institutional infrastructure, such as credit institutions, agricultural research and extension, rural literacy determines the nature and the magnitude of agricultural output in India. Adequate infrastructure raises farm productivity and lowers farming costs and its fast expansion accelerates agricultural as well as economic growth rate.

World Bank study (1997) estimated that 15% of the agricultural 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. Poor rural road infrastructure limits the ability of the traders to travel to and communicate with remote farming areas, limiting market access from these areas and eliminating competition for their produce. Easier access to market allows expansion of perishable and transport-cost intensive products.

Limao and venables (1999) in a study of transportation costs in sub Saharan Africa showed that roads are significant determinants of transportation cost, and that when a region is land locked, transportation cost increased by 50percent. They reported that most of Africa's poor trade performance was the result of weak infrastructure.

Ahmed and Hussain (1990) an empirical study by demonstrated that the fertiliser use in the agricultural sector increases with the improvement in the quality of road. It should be noted that the transaction cost. That generally falls outside the cost of input prices can be one of the major components of the total cost of production in the agricultural sector and the infrastructure plays a dominant role in reducing the transaction cost. For example, the transportation cost incurred by the farmers in a particular region, both for transporting inputs to the field from the place of purchase and transporting the output to the market place for final sale, can be substantial in the absence of proper transportation facilities. Once the transportation infrastructure has been introduced, the transaction cost may considerably be reduced which has the bearing on the total marginal cost of production.

Binswanger, Deininger and Feder (1993) in a study of 13 states in India, found that investments in rural infrastructure lowered transportation costs, increased farmers' access to markets, and led to substantial agricultural expansion. Better roads also lowered the transaction costs of credit services, resulting in increased lending to farmers, higher demands for agricultural inputs, and higher crop yields.

International Fund for Agricultural Development (1995) observed that construction of rural roads almost inevitably leads to increase in agricultural production and productivity by bringing in new land into cultivation, intensifying existing land use to take advantage of expanded market opportunities. Better roads also lowered the transaction costs of credit services, resulting in increased lending to farmers, higher demand for agricultural inputs and higher crop yields.

Seid nuru, holgerbseebens (2008) investigate the impact of location on crop choice and rural livelihood evidence from villages in northern Ethiopia. He found that proximity to urban centers and access to roads increase the share of land allocate to cash crop production and his study also reveals that market proximity may affect crop choices is better access to information about prices or new technologies and house hold located at closer to urban areas which access to road but who do not have irrigable land tend to invest in commercial livestock farming.

Mellor's (1976) outline for the future economic development of India places infrastructural development as one of the top priorities. Mellor indicates that infrastructure plays a strategic role in producing large multiplier effects in the economy with agricultural growth. As agricultural incomes grow, consumption expenditures increase in rural areas, creating increased demand for urban goods-the multiplier effect.

Objectives

- 1) To Analyze the impact of road infrastructure on agricultural development
- 2) To analyze the role of road infrastructure development programmes on Agricultural Development

Impact of Road and Road Transport in Agricultural Development

Rural Roads Connectivity is one of the important components for rural development, as it promotes access to economic and social services, generating increased agricultural income and productive employment. About 600 million people of India live in around 6 lakh villages spread all over the country. Road access provides the means to bring the rural population on to the main stream. A better road network leads to efficient delivery of farm inputs, reduce transport cost and enhance special agricultural production and distribution. A better network of roads will expand the distribution of agricultural goods as well as open up additional opportunities for agricultural trade (Inoni 2009).

A good infrastructure promotes to expansion of markets, economies of scale and easy operations of factor markets. It also opens up the rural economy to greater competition from outside. This may take the form of cheaper products from lower-cost sources of supply or new or improved products that may displace some locally produced items. The many of studies reveals that investment in infrastructure has a positive impact on rural incomes. There was a positive relationship between increase in acreage of export crop cultivation and the standard of roads and distance from the main commercial centers. There is enhanced entrepreneurship activity, sharp decline in freight and passenger charges and improved services as a result of investment in rural roads (Bonney, 1964). Roads are always considered as an infrastructure and arteries of the nation. Rural infrastructure become great importance in India because of the country's basically rural in nature.

Rural Roads and Change in Agricultural Production

Rural roads are not only providing connectivity to rural area but also affecting change in cropping pattern due to access to markets, increasing productivity by facilitating availability of inputs like fertilizer, seeds and pesticides, realization of better prices to the farmers for agriculture and allied products like milk, improving attendance in schools and above all opening new employment opportunities in non-farm and service sectors (Sangwan S S, 2010).

All weather roads would promote the production of agricultural commodities. Its impact is likely to be relatively greater in the production of highly perishable agricultural products such as fresh vegetables, milk, eggs, poultry, fresh fruits, etc. These products are also easily susceptible to spoilage on account of rough and slow haulage. Because of these characteristics, the inadequacy of all weather village-to-market roads act as a great obstacle to the expansion of their production for the market. Rural roads and Transportation network bring about desirable communication related to agriculture and farm practices and breaks isolation of villages by evoking awakening in the rural farmers. A good Rural transport services which could facilitate the free flow of the produce to consumer centers and agricultural inputs to rural areas are warranted to facilitate efficient distribution of available food and to accelerate the rural development in India. It helps the farmers and other rural artisans alike in supplementing their slender earnings and in protecting from the ill-favored and squeezing brokers and middlemen.

Rural Road Infrastructure Development Programmes in India

Rural infrastructure Development is imperative for agriculture and overall economic Development as also improving the living conditions. Rural roads are the most important infrastructure for socio-economic betterment of the rural community. Rural roads were create a good environment for economic prosperity and thereby ensuring good living conditions for the rural inhabitants. Provision of rural roads increases mobility of men and materials thus facilitates agricultural and economic growth. Realising the conscious need for creation of basic infrastructure to support agriculture, production, transport, marketing and other allied activities,

Pradhan Mantri Gram Sadak Yojana (Pmgsy)

Rural connectivity is an important factor for overall development of rural community. In the year 2000, around 40 per cent of the 8,25,000 villages in India has been suffering from all-weather access roads. This constrained economic activities and access to essential services. around 74 per cent of India's rural population, constituting the majority of India's poor, were not fully integrated into the national economy. It reveals that even connectivity is provided and constructed roads are poor in quality and they could not considered as all weather roads.

Recognising the importance of the rural road sector, the Government of India intended improvement of rural connectivity. In pursuance of the nationally significant cause of providing complete rural road connectivity through all weather roads, to remove bottlenecks of accessibility and deprivation of accessibility and free from

the handicap of isolation, Government of India set up the National Rural Roads Development Committee (NRRDC) in January, 2000 chaired by Shri Nitin Gadkari. This committee after dwelling on the effects of deprivation of rural accessibility and keeping in view expected benefits from rural connectivity recommended a special intervention, the Pradhan Mantri Gram Sadak Yojana (PMGSY) which was launched on 25th December, 2000 as a 100% Centrally assisted scheme to provide all weather connectivity to over 1.6 lakh eligible unconnected habitations at an estimated expenditure of Rs. 60,000 crores. The PMGSY is to provide connectivity by way of an All-weather road, to the unconnected eligible Habitations in the rural areas in such a way that all unconnected Habitations with a population of 1000 persons and above can be covered in three years (2000-03) and all unconnected Habitations with a population of 500 persons and above by the end of the 10th Plan period (2007). In respect of the Hill States and the Desert areas as well as the Tribal areas, the objective would be to connect Habitations with a population of 250 persons and above.

Table-1: Habitations Connected and Length Completed Under PMGSY

SL.NO	States	Habitations connected upto March 2015	Length Completed Up to March 2015 (KM)
1	AndraPradesh & Telangana	1780	21294.77
2	Arunachala Pradesh	336	4774.44
3	Assam	7510	15522.62
4	Bihar	13442	32913.59
5	Chattisgarh	8231	24426.49
6	Goa	2	158.70
7	Gujarat	2987	10556.76
8	Haryana	1	5190.31
9	Himachal Pradesh	1957	10644.92
10	Jammu & Kashmir	1413	6121.32
11	Jharkhand	5040	11303.06
12	Karnataka	275	16765.92
13	Kerala	375	2134.84
14	Mahya Pradesh	13235	60386.23
15	Maharashtra	1211	22946.28
16	Manipur	388	4221.16
17	Meghalaya	181	1100.47
18	Mizoram	155	2322.16
19	Nagaland	90	3266.87
20	Odisha	9072	32387.82
21	Punjab	413	6227.74
22	Rajasthan	12878	56281.00
23	Sikkim	223	2670.18
24	Tamil Nadu	1948	12665.37
25	Tripura	1698	3110.46
26	Uttar Pradesh	11129	43216.70
27	Uttarakhand	770	5645.80
28	West Bengal	11897	17991.47
29	Puducherry	0	68.53
	Total	108637	436315

Source: Annual report 2014-15, National Rural Road Development Agency

Bharat Nirman

Bharat Nirman Programme is an important Programme to Provide the basic amenities in rural areas of the country. Rural roads component is one of the six components of Bharat Nirman. February 28, 2005, the Finance Minister in his budget speech has announced this programme, that targets to seek to provide all-weather connectivity to all habitations having population of 1000 or more (500 or more in hill, tribal and desert areas) by 2009. While the primary objective of PMGSY has been to provide 'last mist connectivity' to all unconnected eligible habitations, in order to ensure full farm to market connectivity Bharat Nirman also includes an upgradation component. It is estimated that under Bharat Nirman 66802 habitations would be provided new connectivity with a road length of 1,46,185 km. Besides, 1.94 lakh km of existing through routes of the Core.

Up to march 2014, as many as 51,253 habitations were provided connectivity and length constructed as 1,72,916 kilometers under this programme.

Bharat Nirman- New connectivity length and Habitations Connected

Under the Bharath Nirman Program State wise the length of rural road constructed and Habitations connected during April 2005 to March 2014 have been detailed at.

Table-2: New connectivity length and Habitations Connected by Bharath nirman

SL.No	Name of the State	Length constructed up to march 2014 (in K.Ms)	Habitations
1	Andra pradesh*	2,513	221
2	Arunachala Pradesh	781	97
3	Assam	13,772	5333
4	Bihar	21,529	9288
5	Chattisgarh	12,924	3318
6	Goa	2	2
7	Gujarat	3,939	1271
8	Haryana	45	0
9	Himachal Pradesh	3,950	650
10	Jammu & Kashmir	4,592	1040
11	Jharkhand	6,964	2011
12	Karnataka	72	17
13	Kerala	180	70
14	Mahya Pradesh	33,802	6789
15	Maharashtra	1,757	290
16	Manipur	1,703	237
17	Meghalaya	388	53
18	Mizoram	1,409	124
19	Nagaland	1,141	36
20	Odisha	16,185	5117
21	Punjab	178	50
22	Rajasthan	13,409	3913
23	Sikkim	896	131
24	Tamil Nadu	744	82
25	Tripura	2,209	689
26	Uttar Pradesh	9,790	4080
27	Uttarakhand	4,474	454
28	West Bengal	13,569	5890
	Total	1,72,916	51253

Rural Infrastructure Development Fund

Development of rural infrastructure is important for agricultural and overall economic development as also improving the quality of life. Realising the conscious need for creation of basic infrastructure to support agriculture, production, transport, marketing and other allied activities, the Rural Infrastructure Development Fund (RIDF) was set up within NABARD in 1995-96, as a lending facility. The Honorable Finance Minister in his Budget speech declared "Inadequacy of public investment in agriculture sector is one of the important matter of general concern. This is an area, which is the states responsibility. Many States have neglected investment in infrastructure for agriculture. There are many rural infrastructure projects which have been started but they are incomplete because of shortage of funds. They create a major loss of potential income and employment to rural population." Started with 2,000 crore during 1995-96 (RIDF I), the annual allocation to the Fund has now reached 16,000 crore during 2010-11 (RIDF XVI), taking the cumulative allocation to 1,16,000 crore. Additionally, a separate window was introduced in 2006-07 for the funding rural roads component of the Bharat Nirman Programme, with allocation of ` 18,500 crore, till 2009-10. The total allocation for RIDF, thus, stood at 1,34,500 crore, as on 31 March 2011. The major activities supported under RIDF include: Irrigation, Rural Bridge, Rural Roads, Rural Drinking Water Supply, etc. Bulk of the investments made in creation of rural infrastructure has been almost shared between irrigation (38.7%) and rural roads (40.1%) followed by rural bridges (13.2%); leaving only 8 per cent for other infrastructure activities such as Watershed development, Flood protection, Market-yard development, CADA, Cold-storage, Fisheries, Forest development, Rural drinking water, etc.

Rural Road Infrastructure Development Programmes In Karnataka

The total rural road length upto March 2013 in Karnataka is 1, 47,212 Kms of which 48,811 Kms is asphalted, 21,980 Kms has macadam surface, and 76,421 Kms consists of mud roads. since 1987 construction, improvement of rural roads and their maintenance is the responsibility of the Zilla Panchayats. Technical supervision of the roads at the state level, which was with the Public Works Department till the end of 1999, was transferred to the Rural Development and Panchayat Raj Department with effect from 2000 onwards.

Improvement of roads and their maintenance is being taken up under Pradhan Manthri Gram Sadak Yojana, Mukhya Manthri Grameena Rasthe Abhivruddhi Yojane (CMGSY) and RIDF schemes.

Pradhan Manthri Gram Sadak Yojana (PMGSY)

In the state the PMGSY was launched during December 2000 with the objective of providing rural connectivity by way of all-weather roads to eligible habitations having a population of 500 and above by the end of 2007. Under this programme, Rs 3,642.12 crore was spent and 16,049.60 Kms of road length was asphalted as on October 2013. In order to implement the scheme more effectively, Karnataka Rural Road Development Agency was formed in January 2005. The agency is involved in preparation of projects in each stage, implementation of the works (as approved by Government of India) as per the required standards and, release of grants provided by Government of India. The State has connected 2,235 unconnected habitations till recently.

Table-3 :Year wise details of Rural Connectivity

Year	All weather Roads (Kms)	Good Roads (Kms)	Earthen Roads (Kms)	Villages not connected by Roads
1997-1998	15,800	6,551	4,612	103
1998-1999	16,305	6,419	4,255	87
1999-2000	16,857	6,099	4,045	65
2000-2001	17,442	5,764	3,819	41
2001-2002	17,802	5,462	3,769	33
2002-2003	17,802	5,649	3,582	27
2003-2004	18,295	5,860	3,501	20
2004-2005	20,304	6,065	3,473	20
2005-2006	22,454	6,146	3,422	17
2006-2007	23,801	6,232	3,407	1718
2007-2008	24,710	6,540	3,376	1718
2008-2009	64,116	27,630	55,458	1718
2009-2010	65,904	26,450	54,858	2235
2010-2011	66,791	25,863	54,558	2235
2011-2012	68,649	24,748	53,815	2235
2012-2013	70,791	24,478	51,943	2235

Source: Economic Survey of Karnataka 2013-14.

Table reveals the details of rural connectivity. 64,116 Kilometers of all weather roads, 27,630 Kms of good roads and 55,458 Kms of earthen roads were there and 1718 villages were not connected with the roads in the year 2008-09. In the year 2009-10 one can notice that 65904 Kms of all weather roads, 26450 Kms of good roads and 54858 Kms of earthen roads were connected and 2235 of villages were not connected through roads. 66791 Kms of weather roads, 25863 Kms of good roads and 54558 Kms of earthen roads were connected and 2235 villages are not connected with villages in the year 2010-11. In the year 2011-12 all weather roads were about 68649 Kms, good roads were 24748 Kms and 53815 Kms were earthen roads was constructed and same as the number of village roads which were not connected with roads remains the same in the present year and also in the 2012-13. All weather roads were increased to 70791 Kms, and good roads were about 24478 Kms and 51943 Kms of earthen roads were connected during year 2012-13.

Chief Minister Gram Sadak Yojana:

To provide all wether connectivity to the rural habitations as per the design standerds and to maintain the same to the required standerds for their overall social and economic development. Presently chief minister gram sadak yojana (CMGSY) roads maintaiance and development I undertaken. Under Mukhya Mantri Gramina Raste Abhivruddi Yojana a sum of Rs.14,827.50 lakhs have been provided in the annual budget for 2011-12.

Under Mukhya Manthri Grameena Rasthe Abhivruddhi Yojane, a sum of Rs.14979.70 lakhs was provided in the annual budget for 2012-13. The funds so provided were allocated to Zilla Panchayats as per Dr.D.M.Nanjundappa Committee report for maintenance of roads in the state of Karnataka.

Namma Grama Namma Raste (Our Village, Our Road) Yojana

Rural Road Connectivity is not only a key component of Rural Development by promoting access to economic and social services and thereby generating increased agricultural incomes , improving productivity and productive employment opportunities in India, it is also as a result, a key ingredient in ensuring sustainable poverty reduction. The Department of Rural Development and Panchayat Raj Of Government of Karnataka have launched the Namma Grama Namma Raste Yojana on January, 2010 to provide

all- weather access to unconnected habitations. The Namma Grama Namma Raste Yojana (NGNRY) is a 100% State Sponsored Scheme. RDPR Minister Jagadish Shettar, after launching the system here, said that the department had taken up development and upgradation of 20 km of roads in each Rural Assembly constituency under NGNR scheme.

The important objective of the NGNRY is to provide all weather road 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 rural Habitations. The NGNRY will permit the Upgradation of the existing roads in those Districts where all the eligible Habitations have been provided all-weather road connectivity. rural road improvement projects worth Rs 3,658 crore in 189 Assembly constituencies across the state. Under one scheme, 20/30 km of rural roads will be developed in each of the 189 Assembly segments at a cost of Rs 42 lakh per km — which includes a maintenance period of five years. From NGNRY phase I 1400 No. of works for a length of 3714.65 km have been approved. Out of which all works have been completed.

II. CONCLUSION

It is well known that the roads are playing an important role in uplifting the social, economic and cultural life of the people; access to better road network to rural areas substantially enhances the socioeconomic status and improves the living condition of rural population. There is an inter-related relationship between roads and agricultural production, and also, the impact of such enhanced agricultural production on income, living standard, attitudes and other activities of the rural people. For this reason government of India gave importance to rural road construction by launching Pradhana Manthri Gram Sadak Yojana, Bharath Nirman, Rural infrastructure Development Fund etc., This programmes which provide improved infrastructure to rural farm sector and improving agriculture and socio economic upliftment of rural poor.

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