Study on the impact of nationwide rural road connectivity programme in India (PMGSY) on the socio-economic status of the rural people under Wozhuro Rural Development Block, Wokha District, Nagaland

ABSTRACT

The development of rural road connectivity brings multiple socio-economic benefits to the rural areas, which form a strong base of the national economy, and it is a powerful instrument for the socio-economic transformation of the villages, such as increased employment opportunities, increased agricultural productivity, savings in the cost of transportation, improved health care and educational facilities, and a change in livelihood status. The study was conducted under Wozhuro R.D. Block in Wokha district to find out the socio-economic impact of PMGSY road connectivity on rural livelihoods. A purposive random sampling design was used for the selection of respondents. A total of 100 respondents from three villages comprised the sample for the study. A structured interview schedule was developed, and data was collected through the personal interview technique. Statistical tools such as frequency, percentage, and the correlation coefficient were used for analysing the data obtained. The findings showed that there was a great impact of rural roads on both farm and non-farm sectors. The dependent variable, income generation, was found to have a positive and significant relationship with the independent variables, family size (r=0.20**) and land holding (r=0.27**). Also, farm benefits were found to have a positive and significant relationship with land holding (r=0.39**) and annual income (r=0.66**), and non-farm benefits (health r=0.44** and education r=0.70**) with annual income.

Keywords: All-weather roads, PMGSY, roads, rural connectivity, socio-economic impact.

INTRODUCTION

Rural connectivity through all-weather roads plays a significant role in uplifting the socio-economic conditions of rural areas. It promotes access to various economic and social developments, which include education and health care services, as well as modern agricultural farm inputs and machinery, thereby leading to agricultural development and income-generating opportunities for rural farmers. A vast majority of the population in India lives in rural areas, but lack of well-knit road connectivity has deprived the rural areas of basic amenities like education, medical health care facilities, banking, employment, and

access to modern agricultural facilities, thereby leaving a large section of the country's rural population below the poverty line and depriving them of mainstream economic and social development. This has resulted in large-scale migration of the rural population to towns and cities in search of better livelihood opportunities. To prevent this situation, the government of India has embarked on several rural development and poverty alleviation programmes in the rural areas of the country. On the 15th of August 2000, the Prime Minister announced a centrally sponsored scheme called the PradhanMantri Gram SadakYojana as a fully funded, centrally sponsored scheme to provide all-weather road connectivity in rural areas of the country, on the recommendations of the National Rural Roads Development Committee. The scheme was launched on December 25, 2000, and has been formulated as an anti-poverty programme, focusing on providing connectivity to unconnected rural habitations to enable access to economic and other essential services. Barwell (1996) stated that rural connectivity is the only means for a country's rural people to achieve all-round development, which includes better education, access to medical and banking facilities, better transportation, and working facilities. Pant (2000) mentioned that the country has yet to overcome the problems of poverty. Today, an estimated 350 million out of one billion people fall below the poverty line. More than 60 percent of the population is still dependent on agriculture for livelihood and employment. NRDA (2004) found that with the construction of *PMGSY* roads, there has been an improvement in the accessibility of education facilities, which has resulted in increased school enrollment and school attendance in all the states. The PEO (2005) study concluded that PMGSY has succeeded in providing connectivity to some of the most deserving habitations. PMGSY roads provide connectivity to important places such as schools, colleges, market centres, block offices, etc. It has improved the accessibility of beneficiary villages and resulted in higher incomes in the form of a better price for agricultural produce, new employment avenues, etc. Nair and Kumar (2006) assessed the impact of rural roads in terms of increased income in the farm sector of the benefited area, and results indicated that the rural road benefited the farm sector in terms of reduction of transport costs, reduction of spoilage of produce, price gains from timely marketing, and income gain from a shift in cropping pattern. Althaf (2010) found in his study that the PMGSY roads connected the habitations with district headquarters, block headquarters, the main banks, the nearest hospitals, markets for household assets, markets for provisions, fertiliser and pesticide shops, a veterinary hospital, and bus stops with all-weather roads. Mukherjee (2012) concluded in his study that better road connectivity had a positive impact on school enrollments across different age cohorts and social backgrounds. A study

conducted by Jain (2014) revealed that the construction of PMGSY roads has led to many employment opportunities and the active involvement of housewives in small-scale industries like pickle making, etc., which has significantly contributed to a decreased rate of poverty. Ghosh (2017) stated that access to quality roads significantly contributes to agricultural productivity, poverty reduction, and improvements in health and education. Biswas and Anwaruzzaman (2018) in their study indicated a positive impact of PMGSY Road on employment generation, with 78 percent of the respondents responding affirmatively. Mamun and Paul (2017), in their study on the impact of the rural transport system on the agricultural development of Jalangi block as a case study, concluded that the improvement of the rural road system leads to increased agricultural productivity. A major part of the area under Nagaland is hilly and undulating, which makes it impossible for other transportation means such as railways to connect all the areas in a cost-effective way. Thus, roads serve as the major infrastructure for transportation in the state, providing basic inputs for all-round socio-economic development and also serving as the backbone for the agricultural sector in the rural areas. Various road development projects have been undertaken in the state, keeping in mind the importance of road connectivity for the socio-economic upliftment of the rural areas. Therefore, an effort has been made to study the socio-economic impact of PMGSY on the rural people under the Wozhuro rural development block, Wokha district, Nagaland.

RESEARCH METHODOLOGY

The study was conducted in the Wokha district of Nagaland State. Out of the seven rural development blocks in the district, Wozhuro rural development block was purposively selected for the study. A purposive cum random sampling technique was used to select the respondents for the study. A total of 100 respondents were selected from three villages to form the sample size for the study. A structured interview schedule was developed for the collection of data, which was pre-tested on a small non-sample population before final data collection. The variables for the study were selected keeping in mind the objective of the study and in consultation with various available literature and sources. The study is based on primary data collected from the sampled respondents through personal interview techniques. Statistical tools such as frequency, percentage, and the correlation coefficient were used to analyse the data.

3. FINDINGS AND DISCUSSIONS

3.1 Socio-economic variables of the respondents

3.1.1 Age

Table1. Distribution of the respondents based on their age.

Sl. No.	Category	Frequency	Percentage
1.	Up to 30 years	40	40%
2.	31-50 years	48	48%
3.	51 and above	12	12%
	Total	100	

The respondents were divided into three categories based on age. The majority, i.e., 48 percent of the respondents, were found to be within the age group of 31–50 years, followed by 40 percent (up to 30 years) and 12 percent (51 years and above). It can be inferred from the findings on age that persons with physical vigour and accountability towards the family form the largest age group category. Manual work was mostly done by persons belonging to the 30–50 age categories because of their physical and mental ability.

3.1.2 Gender

Table 2. Distribution of the respondents based on sex.

Sl. No.	Category	Frequency	Percentage
1.	Male	77	77%
2.	Female	23	33%
3.	Total	100	

Table 2 shows that the male population formed a larger part of the selected respondents, comprising 77 percent to 23 percent of the female population. The larger number of male respondents may be due to the fact that they were more exposed to different activities, including attending training programmes, seminars, campaigns, etc., which made them more interactive in acquiring reliable information regarding the concerned subject. The women, on the other hand, were more engaged in household activities, which deprived them of many extra-curricular activities.

3.1.3 Education

Table 3. Distribution of the respondents based on their education.

Sl. No.	Levels of Education	Frequency	Percentage
1.	Illiterate	40	40%
2.	Primary level	49	49%
3.	Secondary	7	7%
4.	Secondary and above	4	4%
	Total	100	

Table 3 revealed that the maximum number of respondents have attained a primary level of education (49%) followed by illiterate (40%), secondary level (7%), and secondary and above level (4%). Respondents with a primary education level formed the largest category. The findings on education showed that the literacy rate of the respondents was not satisfactory, as the majority of them were illiterate and a majority had attended only the primary level of education. This justified their confinement with employment within the villages on the one hand and poor socio-economic status to avail better education on the other hand.

3.1.4 Marital status

Table 4. Distribution of the respondents based on marital status.

Sl. No.	Category	Frequency	Percentage
1.	Unmarried	23	23%
2.	Married	77	77%
	Total	100	

As evident from Table 4, the majority (77%) of the respondents belonged to the married category, while 23 percent belonged to the unmarried category. It was observed that the majority of the respondents were married. This explains the reason for seeking employment, most probably to provide sustenance for their respective families.

3.1.5 Family size

Table 5. Distribution of the respondents based on their family size.

Sl. No.	Category	Frequency	Percentage
1.	Small (up to 5 member)	44	44%
2.	Large (more than 5)	56	56%
	Total	100	

To determine the size of the family, the total number of persons in each family was recorded, and depending on the number of persons in the family, they were categorised into two categories, namely small size and large size. Table 5 revealed that the majority (56%) of the respondents were from large families, with the small family having the least (44 percent).

3.1.6 Land holding

Table 6. Distribution of the respondents based on land holding size.

Sl. No.	Size of land holding	Frequency	Percentage
1.	Landless	9	9%
2.	Marginal (below 1 ha)	34	34%
3.	Small (1-2 ha)	41	41%
4.	Medium(4-10 ha)	16	16%
	Total	100	

The total land holding under agriculture was obtained during the data collection from the respondents and categorised into landless, marginal, small, and medium. Table 6 revealed that the majority (41%) of the respondents belonged to the small farmer's category, whereas 34% of the respondents fell under the marginal farmer category, followed by medium farmers (16%), and landless (9%). It was found that the land holding patterns of the respondents were mostly ancestral for both agricultural and non-agricultural land.

3.1.7 Annual income

Table 7. Distribution of the respondents based on their total annual income.

Sl.	Category	Frequency	Percentage

No.			
1.	Below 20,000	10	10%
2.	21,000-40,000	13	13%
3.	41,000-60,000	40	40%
4.	61,000 and above	37	37%
	Total	100	

It was observed from Table 7 that the majority, i.e., 45 percent of the respondents, had an annual income in the (21,000–40,000) category, followed by 30 percent in the (below 20,000) category, 15 percent in the (41,000–60,000) category, and 10 percent in the (61,000 and above) category, respectively. Those respondents receiving high annual income were farmers who were engaged in different agricultural activities and enterprises compared to the other categories who were least engaged or not engaged.

3.2. Impact of PMGSY on the socio-economic status of the rural people in the study area:

3.2.1 Employment generation

Table 8. Distribution of the respondents based on employment generation.

Sl. No.	Category	Frequency	Percentage
1.	33 days and below	65	65%
2.	34-66 days	25	25%
3.	67 days and above	10	10%
	Total	100	

Table 8 shows the number of working days generated under PMGSY as hired labour during road construction. It was observed that the majority (65%) of the respondent received employment days under the 33 days and below category, followed by 25% in the 34-66 days category, and 10% in the 66 days and above category. Under the PMGSY scheme, there is no fixed number of working days as in other employment-generating programmes like MGNREGA, etc.; however, this table revealed that the majority of the respondents were employed for 33 days or fewer and expressed satisfaction with the daily wage that was

provided to them under the scheme. Biswas and Anwaruzzaman (2018) indicated a positive relationship between PMGSY road construction and employment generation.

3.2.2 Income generation

Table 9. Distribution of the respondents based on income generation.

Sl. No.	Particulars	Frequency	Percentage
1.	Agriculture	21	21%
2.	Livestock	11	11%
3.	Business	9	9%
4.	Others	8	8%
5.	Agriculture & livestock	24	24%
6.	Livestock & business	12	12%
7.	Business & others	5	5%
8.	Agriculture & others	6	6%
9.	All of them	4	4%
	Total	100	

Table 9 shows that the majority (24%) of the respondents are dependent on agriculture and livestock, followed by 21% solely in agriculture and 11% in livestock, 9% in business, and 8% in other categories. Twelve percent of respondents earn money from livestock and business, six percent from agriculture and others, and five percent from business and others. It was observed that the majority of the respondents were engaged in an agricultural occupation, where agricultural products such as rice, mustard, potato, and orange were the major crops cultivated in all the villages, whereas livestock included poultry, pigs, etc. Income from businesses and others includes running grocery shops and pan shops, a log business, a fish business, handicrafts, weaving, etc. PEO (2005) in a study concluded that PMGSY roads have improved the accessibility of beneficiary villages and resulted in higher income in the form of a better price for agricultural produce, new employment avenues, etc.

3.2.3 Farm Benefits:Agriculture and Livestock

Table 10. Distribution of the respondents based on farm benefits.

Sl. No.	Particulars	Frequency	Percentage
1.	Reduction in spoilage of produce	65	65%
2.	Improvement in marketing of produce	72	72%
3.	Shift in cropping pattern	56	56%
4.	Increase in animal & poultry production	37	37%
5.	Improved meat quality and sale of meat products	37	37%
6.	Good quality farm manure	58	58%
7.	More access of forage crops	36	36%

Table 10 shows that 65 percent of the respondents benefited from a reduction in spoilage of produce, 72 percent from an improvement in marketing of produce, 56 percent from a shift in cropping pattern, 37 percent from an increase in animal and poultry production, 37 percent from improved meat quality and the sale of meat products, 60 percent from good quality farm manure, and 58 percent from having more access to forage crops. Thus, there was a positive impact on the agriculture and livestock sectors. Nair and Kumar (2006), in a study, indicated that the rural road benefited the farm sector in terms of reduction of transport costs, reduction of spoilage of produce, price gains from timely marketing, and income gain from a shift in cropping pattern.

3.2.4 Non-farm Benefits

a) Health

Table 11. Distribution of the respondents based on health.

Sl. No.	Particulars	Frequency	Percentage
1.	Easy access to maximum medical facilities	65	65%
2.	Access to emergency medical care (emergency doctors/ ambulance etc)	79	79%
3.	Improved medical care for the old and the disabled	43	43%

Table 11 revealed that 65 percent of the respondents had easy access to maximum medical facilities, 79 percent had access to emergency medical care (emergency doctors, ambulances, etc.), and 43 percent felt that there was improved medical care for the old and the disabled. The results thus showed that there has been a great impact on the health facilities where the rural people have easy access to maximum medical facilities and infrastructure. The findings are similar to those of Biswas and Anwaruzzaman (2018) and Balamurugan (2020).

b) Education

Table 12. Distribution of the respondents based on education.

Sl. No.	Particulars	Frequency	Percentage
1.	Easy accessibility to various schools & institutions (transport)	78	78%
2.	Shift from Govt. to private schools/colleges	58	58%
3.	Outdoor exposure like field trip, study tour etc.	12	12%
4.	Additional private tuitions	16	16%
5.	Any children studying outside the State	3	3%

Table 12 showed that 78 percent of the respondents had easy access to various schools and institutions (transportation), 58 percent could manage to shift their children from government to private schools or colleges, 12 percent could afford outdoor exposure like a field trip, study tour, etc., while 16 percent of the respondents could afford additional private tuition, and 3 percent of the respondents could send their children outside the state for higher studies. NRDA (2004) found that with the construction of PMGSY roads, there has been an improvement in the accessibility of educational facilities.

c) Community Welfare

Table 13. Distribution of the respondents based on community welfare.

Sl. No.	Particulars	Frequency	Percentage
1.	Transportation and marketing facilities improved	76	76%
2.	Better road coverage creates/opened employment chances through projects from other agencies other	38	38%

	than PMGSY		
3.	Any new projects being implemented recently from State departments	100	100%
4.	Frequent trainings been conducted in the village by various State Departments/organizations etc.	68	68%

Table 13 showed that 76 percent of the respondent felt that transportation and marketing facilities were improved, 38 percent of the respondent felt that better road coverage creates or opens employment chances through projects from other agencies other than PMGSY, 100 percent recorded that some new projects were being implemented recently from state departments, and 68 percent recorded that there were frequent trainings conducted in the village by various state departments, organisations, etc. In a similar finding, NRDA (2004) observed that the construction of the PMGSY road has led to an increase in the frequency of visits by government officials.

d) Others

Table 14. Distribution of the respondents based on others.

Sl. No.	Particulars	After PMGSY	
		Frequency	Percentage
1.	Television	10	10%
2.	Radio	8	8%
3.	Telecommunication (Mobile/landline/internet)	22	22%
4.	Access to other new technological innovations. Example-solar lamps, rice mill, water pump etc	36	36%
5.	No. of business establishments (any) being set up	7	7%

Table 14 revealed that there was a positive impact on the standards of living of the people after the implementation of the programme as they could afford some of the new technologies like telecommunications, etc., and builtup new business establishments, to name a few. A similar finding by Althaf (2010) found that farmers and shopkeepers had increased economic activity after road construction; there was an introduction of new shops in the villages.

3.2.5 Social participation

Table 15. Distribution of the respondents based on social participation

Sl. No.	Particulars	Frequency	Percentage
1.	Contact with VDB/ Village council	75	75%
2.	Contact with Govt. Officials (Agriculture/Veterinary/Others)	76	76%
3.	Contact with Bank officials (NABARD/SBI/RRB/Others)	38	38%
4.	Contact with NGOs	33	33%
5.	Member of any organization	29	29%
6.	Any other	8	8%

Table 15 explains the distribution of the respondents based on their social participation. By social participation, the researcher means the extent to which an individual participates in a broad range of social roles and relationships. It was observed that the respondents were socially active and had contact with the village council, government officials, banks, and various NGOs.

3.4 Correlation between independent variables with dependent variables:

Table 16. Correlation between independent variables with income generation:

Sl. No	Variables	Correlation coefficient 'r'
1.	Age	0.02
2.	Gender	-0.05
3.	Education	-0.06
4.	Marital status	0.12
5.	Family size	0.20**
6.	Land holding	0.27**
7.	Annual income	-0.10

****=Significant @ 1%α**

Table 16 shows that the variables family size and land holding had a positive and significant relationship with income generation.

Table 17. Correlation between independent variables with farm benefits and non-farm benefits:

Sl. No.	Variables	Correlation coefficient 'r'		
		Farm benefits	Non-farm benefits	
			Health	Education
1.	Age	0.04	0.12	0.03
2.	Gender	0.08	-0.07	0.03
3.	Education	-0.02	0.18	0.13
4.	Marital status	0.06	0.07	0.00
5.	Family size	0.14	0.06	-0.02
6.	Land holding	0.39**	-0.03	0.12
7.	Annual income	0.66**	0.44**	0.70**

****=Significant @ 1%α**

Table 17 shows that land holding and annual income had a positive and significant relationship with farm benefits, while there was a positive and significant relationship between annual income and non-farm benefits.

CONCLUSION

Rural roads provide basic inputs for the all-round socio-economic development of rural areas. The provision and construction of roads and road links bring multiple socio-economic benefits to rural areas and result in forming a strong backbone for the agro-based economy. The study found that the scheme had a significant impact on raising the standard of living for rural people. There has been a positive impact on employment generation, an increase in annual income, the farm sector (such as agricultural, livestock, and marketing), as well as the non-farm sector (viz., health, education, community welfare, household assets, etc.). Here, the researcher concludes that since rural connectivity under PMGSY had a positive impact on the socio-economic status of the rural people under the Wozhuro rural development block covering three villages, more emphasis should be given to the proper implementation of the scheme as rural connectivity is essential for the overall development of the rural areas as there is a close link between rural connectivity and socio-economic aspects, such as economic growth, employment, education, and health care.

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