CHAPTER-II

REVIEW OF LITERATURE
Substantial empirical studies on different aspects of rural development have been conducted in India and abroad. However, a few of these have covered rural development in relation to rural roads connectivity. In depth reviewing of the scholarly attempts has led to seek understanding of the progress made so far in the field of research so as to search out the scope and relevance of the present study. Further in order to determine the requirement of the analytical approach for the conduct of research, reviewing of the existing literature is the basis. With these considerations, the present research endows with a detailed reviewing of existing literature. Studies have already established that there exists a strong relationship between rural roads and socio-economic development. The studies are reviewed as follows:

Squire and Tak (1975)\(^1\) in "Economic Analysis of Projects", expressed that institutional interest in social aspects first appeared indirectly in the 1970s in the form of concern with the distributional consequences of investments and gradually these affected the socially deprived groups. According to them, the method for calculating real 'social' benefits of road investment projects is as per the criteria developed by the World Bank.

Carnemark et al.,(1976)\(^2\) have concluded in their study, "The Economic Analysis of Rural Road Projects." that despite the long standing involvement of the World Bank in rural roads in SSA(Sub-Saharan Africa), no clear policy framework for rural roads has emerged as a consistent guide to governments, bank staff and other donors. Sustainability problems related to planning, funding and most importantly maintenance are still remaining to be addressed according to them.

Sharma et al, (1977)\(^3\) in "Endowments and Rural Infrastructure : Issues Today", are convinced that rural development as a concept and a reality has suffered intellectual importance and it is heavily biased by philosophical-methodological assumptions which are quite unrelated to the actual configuration of problem-situation. They are of the opinion that over the years, it has created ambivalence and equivocation among those who regard rural reconstruction as a faith and a mission to the soil. Further, the scholars have
stated that it would neither be charitable nor compatible to blame wholly the lack of policy emphasis or even its clear articulation to account for the inadequate pace of rural development but the very nature of the process is extremely complex, requiring multidimensional approach and interdisciplinary knowledge. They believe that the effort also has suffered owing both to paucity of resources and lack of commitment, not altogether unexpected in nation-building activities of developing countries having traditional societies.

**Devres (1980)** has stated in the scholarly work entitled "Socio-economic and Environmental Impacts of Low-volume Rural Roads" that the rural society is affected by the rural roads. The author finds that construction of new roads influence positively, neutrally as well as negatively to the landowners, middlemen, retailers, truckers, urban dwellers and people belonging to upper and middle income levels. However, it has been agreed by the author that the fundamental effects of roads is reinforcement of the development of capitalism and widening of income disparities. He has further highlighted that in terms of distributional aspects, the investments on the poorest are overwhelmingly negative. Partly this is because income distribution and poverty alleviation were felt to be seldom considered as criteria in the selection of projects. It has been argued that an area's potential contribution to agricultural output is the main factor considered in the process of road selection. This can be expected to reinforce existing social and economic structures and to speed up any tendency towards increasing social and economic stratification, mainly because it would help wealthier and better-informed producers to expand faster than others. Also, the use of labour-based methods has been found rare giving few direct income transfers to the poor.

**Hine (1982)** in his paper, "Road Planning for Rural development in Developing Countries: A Review of Current Practice", studied the impact of rural roads on agriculture productivity conducted in about 16 countries in which, the author has tried to find out the correlation between agricultural development and investment on roads. The author argues that development in agriculture and growth in its productivity has led to development of roads for commercial use of crops.
Beenhakker and Lago, (1983)⁶ have asserted in their study "Rural Roads Screening and Simplified Economic Appraisal Procedures" that the World Bank had accumulated sufficient experience with the mixed and largely ad hoc use of social and economic criteria in rural road appraisals to warrant review. The study found that the mixing of socio-political and economic criteria was unsatisfactory in weeding out unfeasible (non-economic) rural road components against feasible (economic) components. They recommended that socio-political considerations be confined to the pre-screening stage of appraisal and major consideration should be to strengthen economic considerations.

Howe and Richards (1984)⁷ in their study, "Rural Roads and Poverty Alleviation" revealed that since the end of the 1970s, emphasis has been drawn upon construction of roads with wide range of coverage in the rural areas in the developing countries which has resulted to access to education, health and other welfare facilities as the rural population could access to the areas of better services due to the facility of roads. However, they advocated that there is a need to comprehensively focus upon covering all rural areas with the facility of roads for the equitable growth and development of these areas in comparison to the urban.

Thomas,(1984)⁸, has tried to highlight in "Rural Roads and Poverty Alleviation in India" that Indian road planning is exceptional due to the fact that it has always been based on a mixture of socio-economic criteria that sought to achieve economic growth with equity. The scholar is of the view that this blend of socio-economic equity has started as early as 1943 under the Nagpur Plan and has been a continuous feature till date. However, it has been felt that the benefits have not been identified due to it and the actual achievements have differed significantly from the plans which is a matter of serious concern for the researchers.

In "The District Road Improvement and Maintenance Program- An Evaluative Study" Relf.(1986)⁹ has revealed the difficulties of transferring responsibility for rural road maintenance to local organizations by stating that although District Road Improvement and Maintenance Program (DRIMP) has been implemented yet, the inability to hand over maintenance to districts has
been due to their lack of organizational, technical and managerial resources. Hence, it has been suggested to emphasize upon development of skills at local levels for seeking services for the maintenance of roads.

Mellor and Desai (1986)\textsuperscript{10} have suggested in their study related to MADIA (Managing Agricultural Development in Africa - Bank Research Project) of Cameroon, Kenya, Malawi, Nigeria, Senegal, and Tanzania entitled, "Agricultural Change and Rural Poverty" that the present rural road network of SSA (Sub-Saharan Africa) needs to be increased up to tenfold if the full agricultural potential of the region is to be realized. The researchers felt that low population densities and low income per capita have put Sub-Saharan Africa at a natural disadvantage where investment in road infrastructure has influenced. The scholars have pointed out that financial constraints and limited capacity for planning and maintenance suggest that in most countries what could be realistically envisaged in the medium-term is a program of rehabilitation and maintenance, with gradual expansion of road density where required.

In the report on rural road operations concerned with labor intensive work, Beenhakker et.al. (1987)\textsuperscript{11} provide a complete and practical guide to planning and implementation for supporting rural road and transport policies. In an effort to foster a common policy, the study has been carried out to assess experience in rural road lending and to identify the lessons and policy implications for (Sub-Saharan Africa) SSA governments, the banks and other donors. The study is based on assessment of the bank experience in rural road lending in SSA with a view to draw lessons concerning policies; and reviews of rural roads and transport and their linkages with agriculture in six MADIA countries (Cameroon, Kenya, Malawi, Nigeria, Senegal and Tanzania).

The comprehensive study on 'Socio-Economic Aspects of Rural Roads' conducted by Planning Commission In India during 1980s(1987)\textsuperscript{12} in selected nine districts under the aegis of Indian Roads Congress was to find out and quantify the possible impact of roads on socio-economic development in rural areas which finds an increase in agricultural production due to road facility, increase in fertilizer consumption, increase in non-agricultural activities, and better utilization of existing facilities like, school, health, banks and post offices.
Similarly, *Socio-Economic Survey* conducted in a remote area in India by CRRI in 1989, showed that the villages located on the main roads are comparatively well developed than those which are away from the road sides.

**Singh (1988)**\(^{13}\) concludes in his study conducted for Agricultural Banking Department of State Bank of India entitled, “Impact of Public Expenditure on Rural Poverty in India”, that there is a lack of infrastructural facilities like roads, market, veterinary hospitals and milk collection centre for the success of the schemes, technical guidance to the beneficiaries is not forthcoming properly so as to help them use their assets economically, there is a lack of coordination among the bank and block officials, insurance claims of animals are not being settled expeditiously and under-financing of the project gives rise to poor return and renders the scheme unviable due to which, such schemes are not providing much fruitful results and hence, it has been recommended that comprehensive planning needs to be made to re-implement the schemes keeping in view all these considerations.

**NCAER and IIMB, (1989)**\(^{14}\) provide guidelines through the studies carried out in 1979 and 1989 on ‘Environmental Assessment in Bank Projects-The Rural Transport Study’. The reports reveal that after the development of rural roads, there has been a change in transport modes in these areas and consequently, there has been growth in rural economic activities.

**Airey (1989)**\(^{15}\) in his published paper, “The Impact of Road Construction on Hospital In-patient Catchments in the Meru District of Kenya”, has advocated that it is commonly assumed in the literature on medical facilities in developing countries that transport conditions and facilities are quite instrumental for providing health services to the patients.

**The World Bank’s (1989)**\(^{16}\) paper, "Sub-Saharan Africa: From Crisis to Sustainable Growth", prepared as a part of the Rural Travel and Transport Project of the Sub-Saharan Africa Transport Program (SSATP), combines the results of a separate review of projects of an individual bank and results of the joint SSATP and MADIA studies on Rural Roads and Agricultural Performance in Cameroon, Kenya, Malawi, Nigeria, Senegal, and Tanzania. It has been stated in the study that the importance of rural roads extends to all aspects of
development of rural communities including demand for and access to health, education, information, etc. Recent comparisons concerning the six countries of the MADIA (Managing Agricultural Development in Africa - Bank Research Project) find that SSA is grossly under-equipped compared with other developing regions and that roads need to be addressed with better policies as they cater to the needs of agriculture, irrigation, forestry or other unclassified rural roads.

In an exclusive study on socio-economic effects of different projects in the process of development, Cook and Cook (1990) have stated that most of the programmes and projects in Kenya have given generally disappointing results particularly with reference to people living in poverty. Therefore, it has been suggested that more dynamic and practical projects based upon the need of the poor people should be implemented in the rural areas so as to provide benefit to the larger strata of population thereby socio-economic development.

Ahmed and Hossain (1990) in their study, "Development Impact of Rural Infrastructure in Bangladesh" based on the sample of 16 villages categorized into two groups - developed and underdeveloped - on an aggregate index which reflected the ease of access to various services such as markets, schools, banks, and local administrative offices, revealed that the villages which had better than average access, were classified as 'developed' and were found to be significantly better off in a number of areas including agricultural production, household income, wage income of landless labour, health, and the participation of women in the economy. According to them, there is the profound effect that infrastructure has on the income of the poor." Overall, estimations based on the most and least developed villages as per their findings indicate that infrastructural endowment causes household income to rise by 33%: income from agriculture, increases about 24% that from livestock and fisheries about 78%, that from wages almost double and on the contrary, income from business and industries only rises by 17%. This conclusion led the authors to assert that development of rural infrastructure, with roads explicitly identified as being the central component, has to play a key role in any development strategy for Bangladesh.
Riverson et al. (1990) have reiterated in their report, "Rural Roads in Sub-Saharan Africa: Lessons from World Bank Experience" prepared under the Rural Travel and Transport Project of the Sub-Saharan Africa Transport Program (SSATP) the key policy changes discussed under planning, design and technology, resource mobilization, and sectoral organization and institutional performance. The authors have suggested that African governments must develop rural roads strategy closely tied to other highway, rural and agricultural development strategies on the part of governments, the banks and other bilateral donors, long-term commitment, as well as continuity for developing the policy framework and institutional capabilities for rural roads planning, improvement and maintenance. With the prevailing financial constraints, the report has stressed upon the urgent necessity to develop a coherent Rural Road Strategy and support for institutional capabilities in each country. The rural roads have been suggested to be designed to provide essential access, emphasizing spot surface improvements better drainage. Further, labor-based methods should be systematically promoted for construction, rehabilitation and maintenance of rural roads where conditions are appropriate.

Gaviria, (1990) in his discussion paper, "A Regional Analysis of Institutional and Financial Constraints to Rural Transport: The Case of Tanzania" has stated that improving rural infrastructure is an essential requirement for the modernization and growth of agriculture. He argues that better market incentives to farmers will be blunted if the physical barriers and economic costs of transporting goods to and from local markets are too high. Further, it is felt that deficient rural transport capacity has stifled the strong initial supply response elicited from farmers by adjustment programs.

Heggie, (1990) has revealed in, "Designing Environmentally Sound Transport Projects", that the environmental concerns cover the natural and social conditions surrounding all organisms and transport projects are therefore to be examined in terms of their: (i) direct physical impacts on the environment (e.g., effects on noise levels, air and water quality, soil erosion, and flora and fauna); and (ii) indirect impacts which are often socio-economic and/or cultural
in nature (e.g., effects on settlement patterns, tribal organizations, and commercial output).

Braun, et. al. (1991) in "Labor-intensive Public Works for Food Security-Experience in Africa", have focused on the socio-economic changes associated with general public works programmes that include investment in roads, in which characteristically emergency relief and employment creation have been the major objectives.

The World Development Report (1994) titled, 'Infrastructure and Development' has stressed upon the importance of efficient utilization of infrastructure facilities. It has been mentioned that in most underdeveloped and developing regions, it is important to increase the existing stock of infrastructure facilities, there should also be a focus on improving the effective utilization of infrastructure facilities and provision of urban amenities in rural areas is of great significance in this regard.

Chandran and White, (1995) have worked out the impact of improved roads in their scholarly work, "Estimation of Social Benefits of Road Projects - The Revealed Preference Approach". The sealed and unsealed roads used in the comparative analysis of their benefits have been termed as national road segments and have been called as the important instruments of the country's highways system. The authors have opined that the trend towards financing improvements to rural roads carrying traffic volumes below levels that make cost recovery out of user savings, has led to a search for other benefits.

In a study on the role of public works in poverty alleviation titled, "Public works and poverty alleviation in rural China" Ling and Zhongyi (1996) have found that since the early 1980s, China has had the world's largest programme of investment in rural roads for the purpose of addressing poverty. Those made earlier were strongly influenced by economic considerations under 'an efficiency-oriented poverty alleviation strategy'. Among the road projects, priority was given to those giving access to mines and forests, and those which are useful for strengthening the overall network. The researchers found that initially, in the period from 1985 until the mid-1990s, social development
objectives were mainly apparent in the integration of investments to improve road, health, education and water needs etc.

Levy (1996)26 has examined the socio-economic impact of improvements to rural roads in Morocco. The study compares the conditions in the areas of the project roads before and after implementation of the projects and to the conditions of the project areas in comparison to other areas i.e. with and without project areas. The study has found that the benefits of paving rural roads extended considerably beyond the improvement of road use efficiency in terms of lower cost and higher quality. The extended benefits included major changes in the agricultural economy including higher output, transformation of the agricultural output mix from low-value cereals to high-value fruits and increased use of modern inputs, especially fertilizers. Moreover, improved access to education and health facilities have been advocated to be increased enrolment rates in rural schools, as well as led to higher frequency of visits to health care services and enabled the recruitment of professional personnel. It has also been stated that women and girls have been benefited.

Barwell, (1996)27 in the paper, “Transport and the Village” has stated that the travel and transport purposes are commonly used as the basis for analysis in the Integrated Rural Accessibility Planning system. It is revealed that in the mid-1980s the development of rural household-based study techniques led progressively to a further categorization of travel and transport purposes. These were eventually defined as Domestic Transport comprising collection of water and firewood, and trips to the grinding mills to produce ground flour for domestic consumption, Agricultural Travel and Transport comprising trips to the fields for different cultivation activities, movement of farm inputs, collection of the harvested crops, and crop marketing, Travel to Services and for Social Purposes comprising trips to the dispensary and the hospital, travel to markets, travel within and outside the villages associated with visits to family and friends or to meet social obligations, and travel by children to secondary schools. The author has further stated that taken at face value, this categorization reduces the notion of social purposes and benefits to its literal meaning (i.e. socializing with family and friends), which was probably not intended. However, this
categorization is stated to be commonly used as the basis for analysis in the Integrated Rural Accessibility Planning system.

**World Bank's (1996)**\(^{28}\) report “Socio-economic Influence of Rural Roads - Kingdom of Morocco Impact Evaluation Report” evaluates the impact of rural road investment in Morocco which finds that there has been substantial improvement in primary school enrolment, attendance by girls and ensures quality of education. The study also reports that health care facility and quality and its social impact for women has substantially increased.

**Rural Transport Survey (1997)**\(^{29}\) conducted under Andhra Pradesh Economic Restructuring Project has indicated that improvement in the rural roads leads to substantial reduction in freight charges, increase in household income, provision of more employment opportunities and expansion of cultivated land. The author agrees that rural roads accessibility is apparent and it is the cause of removing poverty.

**Collier et al, (1997)**\(^{30}\) have stated in “Density versus quality in health care provision: the use of household data for budgetary choices in Ethiopia.” that investment on road construction has changed geographical accessibility of the hospitals, which have brought more people within easy travelling distance of them.

**Keddeman (1997)**\(^{31}\) in his study, “Of Nets and Assets - Effects and Impacts of Employment-Intensive Program Nines: A Review of ILO Experience” has monitored the socio-economic effects of most programmes and projects in Kenya and finds that the labour-intensive road works are 25-30% cheaper than the capital-intensive methods to employ five times more labour, which can be wage-targeted on the poorest groups.

An area based study of **Kwazulu-Natal (1997)**\(^{32}\) titled “Local Roads for Rural Development in Kwazulu-Natal” identifies that social benefits have reductions in dust and muddy water to roadside residents, pedestrians and vehicle users and it has been beneficial in terms of travel and waiting-time savings. It has been argued that since the roads are similar in length and have the same design and speed, the main difference in their perceived benefits is due to
the effects of sealing the gravel roads. The revealed preferences and known bus fares have been used in the study to compute 'Excess Road Sealing Benefit (ERSB)', which represented the improved comfort of travelling on a dust free road and reduced dust to the nearby householders. The study concludes that inclusion of social benefits has significantly influenced the apparent decision to invest, since without the ERSB the internal rate of return was 11.4 percent and with it 20 percent.

Jalan and Ravallion, (1998)\textsuperscript{33} have stated in their study "Geographic Poverty Traps? A Micro Econometric Model of Consumption Growth in China" that population density and economic growth are interconnected as higher population density results to greater social benefits. Road density has been found to be one of the most significant determinants of household-level prospects of escaping poverty in rural China.

Saxena (1998)\textsubscript{34} has stressed in "Serving the World's Poor Profitably" that for providing employment in the non-agricultural sector, there are gaps in the existing policy related to lack of focus, appropriate support not being extended, inadequate industrial mechanism, lack of research and development and IRDP not being used for forging backward and forward linkages to support micro enterprises. He suggested a holistic approach in bridging the gaps in the policy for providing employment in the non-agricultural sector. Further, it has been recommended that there should be a clear policy for rural industrialization, creation of separate structures with necessary manpower to implement and evaluate the programmes and using the existing infrastructure effectively. Moreover, the scholar has suggested that there should be a technology mission for rural industrialization.

Sharma and Maskay, (1999)\textsuperscript{35} have stated in their scholarly work, "Green Road Approach in Rural Road Construction for the Sustainable Development of Nepal" that the construction of road is carried out in the agricultural slack season through labor intensive techniques generating off farm employment. The high percentage of the money spent on the construction stays actually in the local economy. For it, labor input of 12,000 person days per kilometer is required to construct a green road and payment to labor accounts
for about 65 percent of the total cost per kilometer. Thus, it is a source of employment generation.

**Levy, (1999)** has revealed in “Rural Transport: Planning and Setting Priorities” that rural transport has two main social impacts including better and more usage of education and health facilities and gains to women through increased school enrolment and better use of time. As a result of these benefits, it is recommended that future project designs ought to include estimation of these social benefits.

**Walle (1999)** has asserted in his study, “Assessing the Poverty Impact of Rural Road Projects.” that only a small percentage of bank infrastructure projects include formal impact evaluation studies. The author argues that the most common criticism of past impact evaluations of roads is that they lack appropriate control zones which does not take into account unobserved factors influencing both project placement and outcomes, and that the evaluation does not follow the projects long enough to capture full impact. Admittedly, the food security and economic crisis as well as growing environmental concerns have renewed interest in labour-intensive public works to provide quality local green jobs as per the author.

**Fan et al. (1999)** find in ‘Linkages Between Government Spending, Growth and Rural Poverty’, that an investment of Rs 1 crore in roads lifts 1650 poor persons above the poverty line and public investment on roads affects rural poverty through its effect on improved agricultural productivity, higher non-farm employment opportunities and increased rural wages. Further, it is argued that improvement in agricultural productivity not only reduces rural poverty directly by increasing income of poor households, it also causes decline in poverty indirectly by raising agricultural wages and lowering food prices as poor households are net buyers of food grains. Similarly, increased non-farm employment and higher rural wages also enhance income of the rural poor and consequently, reduces rural poverty. The study has estimated that while the ‘productivity effect’ of government spending on rural roads accounts for 24 per cent of total impact on poverty, increased non-farm employment accounts for 55 per cent and higher rural wages accounts for the remaining 31 per cent. Further,
of the total productivity effect on poverty, 75 per cent arises from the direct impact of roads in increasing income, while the remaining 25 per cent arises from lower food prices and increased wages. Hence, it is a welcome initiative for poverty alleviation according to them.

**Sikdar (2000)** has tried to highlight in the study, “How to Provide Total Road Connectivity to Rural India” that Indian road planning is exceptional as it has always been based on a mixture of socio-economic criteria that sought to achieve economic growth with equity. This started as early as 1943 under the Nagpur Plan and has been a continuous feature until the present, however, individual benefits are not identified and actual achievements have differed significantly from plans. He has emphasized in the paper that the main criteria for the prioritization of network development has simply been the population of the habitations obtaining connection, but this has been subjected to various interpretations. Despite numerous attempts to introduce master or network-based planning approaches, the national situation for prioritizing rural road investment has been stated by him to be remaining confused.

**Hajj and Pendakur (2000)** in their working paper, “Road Improvements for Poverty Alleviation in China” analyzed the use of social criteria of investments. They find that from the mid-1990s, involvement of the World Bank seems to have led to a more explicit use of social criteria targeting of investments which was limited to ‘poor countries’.

**Fujimura and Weiss, (2000)** in their report, “Integration of Poverty Impact in Project Economic Analysis: Issues in Theory and Practice” analyzed the theoretical and practical problems related with designing of distributional weights. They have found that failure of road connectivity in the rural areas is one of the major constraints in the process of development.

**Walle (2001)** in another study “Choosing Rural Road Investments to Help Reduce Poverty” derives the proposed methodology to choose road investments such that they make the maximum contribution to the reduction of poverty. The author argues that previous attempts to derive monetary values for social benefits rest on wholly unrealistic assumptions rather investment on rural roads is a realistic initiative in this direction.
Lebo and Schelling's (2001) research, "Design and Appraisal of Rural Transport Infrastructure - Ensuring Basic Access for Rural Communities" recommends that financing has to be provided by the World Bank to improve the networks in poor regions where the state governments have led to innovations in the way of road improvement in a justified manner in the rural areas in India.

Howe (2001) has highlighted in his paper "Socio-Economic Impact of Rural Transport interventions and Poverty Alleviation" that Infrastructure investments contribute to economic growth and raises the quality of life by reducing the cost of production, making possible the diversification of the economy and by more productive factors of production as well as improvement in all socio-development sectors including health, education and employment generation particularly in the agrarian rural sector. Thus, it has been stressed that emphasis needs to be drawn upon rural transport intervention for the common detriment.

Central Roads Research Institute (CRRI)'s report (2001) "Updation of Road User Cost Study Data: Final Report" clearly reveals that there is positive relationship between the road improvement interventions with socio-economic parameters. It also supplements that the independent assessments of PMGSY in different states of India have also indicated that improvement in transportation services has led to improved access to market centres for the rural producers, better availability of farm inputs at reduced prices and diversification of agricultural improved market access which promotes shift in favour of cash crops and commercialization of agricultural activities. Further, it is stated that better road connectivity has enhanced employment opportunities in the non-agricultural sectors as well as there is diversification of livelihood opportunities. Improved road connectivity, inter-alia, enhances access to education, health and financial services. So, the report concludes that improved rural road facilitates result to better availability of public services and functionaries in rural areas.

Bhagyalakshmi (2001) has pointed out in her work "New Initiative for Poverty Alleviation" that majority of Indian population lives in rural areas having inadequate infrastructure, less employment avenues and low level of socio-economic development. She revealed that new strategies need to be evolved to
accelerate growth and help development of rural areas resulting to give access to the health, education, employment generation and development with special emphasis on women.

A specific sectoral study by Deichman et al. (2002) for Mexico shows that a 10% increase in market access leads to increase in labour productivity by 6%. Further, findings are that in the transport sector itself there has been a perceptible shift in the appraisal process towards directly addressing poverty reduction objectives. One result of this has been to subsume the identification of individual social benefits within pragmatic measures of what it means to be poor. The index of the benefits from a given road link investment is ‘a weighted mean of various measurable indicators, with weights reflecting both the expected benefits and how poor the beneficiaries are’?

Jacoby, (2002) has revealed in “Access to Markets and the Benefits of Rural Roads” that access to roads in Nepal improves the productive capacity of poor households. Hence, it has been stressed that the Government must emphasize upon construction of roads in the rural areas and with wide coverage for the over-all development of the nation.

In an exclusive study on infrastructural development titled, “The Social Rate of Return on Infrastructure Investment” Canning and Bennathan (2002) have argued that a conducive macro-economic environment is essential for efficient resource allocation to reap the positive impacts of infrastructure development. According to them, an orientation to economic demand considerations like services, prices and user charges are essential as the most enduring benefits of infrastructure for the reliability and quality of the services demanded by the users. They suggested that user charges should reflect supply and demand conditions, and non-market externalities as far as possible, to ensure that infrastructure is more economically efficient and environmentally favourable. They however stated that physical infrastructure investment is a form of ‘complementary capital’ that supports services necessary for the operation of productive private capital.

Jalan and Ravollion (2002) have attempted to establish a direct link between infrastructure and economic growth through extensive studies in rural
China in their study, "Geographic Poverty Traps? A Micro Econometric Model of Consumption Growth in China.". As per their estimates, for every 1 per cent increase in the road density per capita, the private consumption expenditure increases by 0.08 per cent in rural China. Similarly, poor households living in communes with paved roads have a higher probability of escaping poverty than households living in communes without paved roads. They suggest for road construction keeping in view the geographical requirements and the population density.

**Ferrara (2002)**\(^5\) in the study, "Who Trusts Others?" acknowledges that trust is not stable through time and it has looked at the role of social and market interactions in building trust.

**Escobal and Ponce (2002)**\(^5\) in their paper, 'The Benefits of Rural Roads: Enhancing Income Opportunities for the Rural Poor' have estimated that the rehabilitation of motorized rural roads in Peru’s rugged terrain yielded the beneficiaries $120 each annually, or 35 percent of the average per capita household income and hence, these are useful for the rural population. The study also revealed that rehabilitation and improvement of rural roads in Peru have improved some measures resulting to access and attendance to schools and child health centers but they have no significant impact on others particularly on agricultural production, income and poverty alleviation.

**Deininger and Okidi (2003)**\(^5\) highlighted that benefits from improving access to basic education in Uganda depend on complementary investments in infrastructure.

In his article "Rural Development Clubs-An Innovative Platform of Catalyzing Rural Development", **Sethi (2003)**\(^5\) has studied the process of technology adoption. He observed that this cannot be taken as a simplistic process like that of giving a pill to common man to revitalize him and pull him up above the poverty line. He revealed that it is to be seen as an interactive process of education regarding the available alternatives. The author finally concluded that the rural communities should be empowered to take decisions for their development.
Paul and Kakali (2003) have made an attempt to study rural development initiatives of different agencies in their paper "Role of Panchayats and NGOs Towards Sustainable Rural Development". They observed that unlike high technologies required and put to use, could be maintained without much public participation. They suggested that any strategy for environmentally and sustainable rural development, needs public awareness for which, Panchayats and NGOs play a key role. They stress for active participation of these agencies to help in active participation of the citizens which can contribute to the sustainable rural development.

Kumar and Ajanta (2004) have observed in their study "Cluster Approach for Developing Rural Entrepreneurship" that success of community attributes to increase the local employment and more business opportunities of firms in the service and support sector drawn into the cluster. They concluded that the successful engagement of local economic factors in the clustering process can in turn spur the development of an entrepreneurial culture of innovation and initiative through the locality.

Fan and Chan-Kang (2004) find that low quality mostly in rural roads has benefit/cost ratios for national GDP in China that are about four times larger than the benefit/cost ratios for high quality roads.

Lokshin and Yemtsov (2005) in their impact evaluation study, "Has Rural Infrastructure Rehabilitation in Georgia Helped the Poor?", have found that road rehabilitation in Georgia has increased the opportunities for off-farm and has generated female wage employment.

Azariadis and Stachurski (2005) have stated that due to the existence of poverty traps and the need to increase rural growth, subsidizing transport services distance from the could be justified in order to increase the economic impact of rural roads.

Dercon and Hoddinott (2005) find that, in Ethiopia, an increase of 10 km in the rural village to the closest market town has a dramatic effect on the likelihood that the household purchases inputs. However, they get mixed results in terms of the likelihood of people engaging in various productive activities
when roads of poor quality (accessible only to carts, animals or people) are replaced by good quality roads (reasonable access to any motorised vehicle).

A Performance Audit of Comptroller and Auditor General (C&AG 2006) finds that under PMGSY, construction of roads has substantially benefitted farmers to sell agricultural goods in bigger markets located far away from their villages. It has been stated in the report that PMGSY has provided road connectivity which has led to a better transport systems during all seasons.

The Draft Vision Document for Rural Roads prepared by Ministry of Rural Development (MoRD-2006) reveals that construction of roads and high rate of roads connectivity to the villagers is directly related with poverty alleviation. The document has given the reference of Living Standard Survey in Vietnam in 2002 which has shown that population living within 2 kms of all-weather roads has lower poverty rates.

Khandker et al., (2006) in their study, “The Poverty Impact of Rural Roads: Evidence from Bangladesh” concluded that road improvement in Bangladesh has led to lower input and transportation costs, higher production, higher wages and higher output prices and has resulted to boost- up the economy.

The assessment report of a study conducted by Price Waterhouse Copers (2006) on ‘Himachal Pradesh Road Sector Finance Study - Final Assessment Report’ has highlighted the key issues in the existing funding mechanism including Low Focus on development of State Highways compared to National Highways and Over-dependence on External Sources for funding and that owing to it’s hilly terrain, the average cycle time for a particular road network needing maintenance is lesser compared to other regions, whereas various schemes are in place to promote new development/ up-gradation of roads in the state, no specific focused scheme is in place to fulfill maintenance needs. It is also not possible to divert funds from specified schemes to other activities as and when the need arises. The maintenance needs are normally taken care by the State’s own revenues (through the non-plan expenditure) and the new development/up-gradation needs are normally financed by the Central grants-in-aid (plan expenditure & PMGSY). The Centre, at present, grants a very
limited aid to the state for road sector maintenance and due to the fiscal constraint on the state's overall ability to generate financial resources and market borrowings, a future scenario is likely to force the maintenance needs of the road network under-financed. The existing funding mechanism is more a scheme based than a need based mechanism. Therefore, a coordinated policy framework that provides a vision and clarity to promote the road sector financing as per the needs of the sector is not present in the existing funding.

Mu and Walle, (2007) have found in their research work “Rural Roads and Poor Area Development in Vietnam” that markets in Vietnam are more likely to develop as a result of road improvement where communities have access to extended networks of transport infrastructure.

Donnges et al. (2007) in their research article, “Rural Road Maintenance. Sustaining the Benefits of Improved Access” argue that rural roads are often treated as the last link of the transport network and they form the most important link in terms of providing access for the rural population and despite of that, their permanent or seasonal absence acts as a crucial constraint in terms of the access of rural communities to basic services such as education, primary health care, water supply, local markets and economic opportunities.

Ramilison and Randrianarison (2007) have revealed that the experience in Madagascar shows that the overall impact of investments in rural roads on employment and income is 2.3 times higher than the capital-intensive option, and savings on foreign exchange are 30 per cent higher. Concerning primary schools, the unit construction cost per square meter using local materials is 42 per cent lower than prefabricated schools built with substantial imported materials, while the direct employment effect is 54 per cent higher. Direct and indirect employment/income is nearly three times higher than in prefabricated construction and foreign exchange savings are considerable. The study also reveals that public spending on infrastructure resulted in twice the increase in added value, twice the increase in household consumption and income, and twice the number of jobs created, in comparison with capital intensive works. Overall, two third of the positive impact on employment, added value, household income and consumption is due to indirect effects and one third
to direct effects of construction itself. It is concluded that locally available resources favour the local market and contribute greatly, via distributed revenue, to a higher level of monetization of the rural economy.

Prime Minister's address at National Conference on Rural Roads (2007)\(^68\) has emphasized that Rural connectivity is a key component of rural development without which, rural economy will not be able to develop as it promotes access to economic and social services and facilitates the growth processes in rural economy. Improved connectivity reduces the cost of transportation of inputs and outputs, promotes diversification of crops and creation of non-farm employment opportunities in our rural areas. It has been emphasized that Bharat Nirman should be labour intensive and the role of different agencies and programmes should be effective with reference to PMGSY (Road Construction), NABARD (RIDF scheme) and other schemes.

The exclusive study titled, "Social Assessment of Pradhan Mantri Gram Sadak Yojana (PMGSY)" conducted by FAITH Healthcare Private Limited (2008)\(^69\) assesses the social concerns in five PMGSY project states and has developed Social Management Frameworks (SMFs) including Resettlement Policy Framework, Tribal Development Framework, Screening And Consultation Framework and Information Package for Dissemination. The report focuses that during finalization of alignment, no provision has been made to mitigate the loss of vulnerable groups such as small and marginal farmers, women headed households, scheduled community, households below poverty line and physically challenged persons. Further, there is no formal grievance redressal mechanism in place absence of Nodal Social Officer at NRRDA. There is no budget head to mitigate losses suffered by the community members and that the likelihood of being employed in high return jobs and in self-employment increases with a decrease in distance to growth pole and the negative effect of isolation is magnified in regions with greater agricultural potential. In contrast, low return nonfarm jobs, paying equal to or less than median agricultural wage of a village, are driven by local demand and are distributed much more evenly across geographical space. Finally, the report concludes that access to smaller rural
towns with population of about 5,000 exerts little influence on nonfarm activities except for non-trade able services work.

**Labonne and Chase** (2008)⁷ have explored the relationship between transaction costs and generalized trust. Using panel data from 2,100 households in 135 rural communities of the Philippines, the paper shows that the regions where transaction costs are reduced (proximity of road construction), there is an increase in generalized trust. Consistent with the argument that generalized trust is built through repeated interactions, the authors find that the individuals most likely to engage in exchange exhibit an increase in trust after road construction. These results suggest that rather than being an input to economic growth, trust might be a product of reduced transaction costs.

**Dillen** (2008)⁷¹ has stated in the study ‘Income and its Variability in a Drought-prone Region: Seasonality, Location and Household Characteristics’ that even if one restricts the benefits to those in the commercial domain, the road is almost surely socially.

**Chen et al.** (2008)⁷² have sorted out the answers of the measures for uplifting poor people in the rural areas in their scholarly work, “Are There Lasting Impacts of Aid to Poor Areas ? Evidence from Rural China.” They worked out impact evaluation of World Bank-financed rural development programme in China ten years after it began and four years after disbursements ended and found that increased production, higher crop yields, increased employment, more traffic, increased use of health services, higher attendance at schools etc. were due to such initiatives and hence, these must be taken for more and more beneficiaries all over the world.

**Loening et al.** (2008)⁷³ in their paper, ”Non-farm Microenterprises and the Investment Climate: Evidence from Rural Ethiopia” have highlighted the possible role of preferences as part of the explanation for these disparities, the paper also aims to contribute to the New Economic Geography literature. To demonstrate these effects, they use a simple theoretical model to analyze the effects of market integration on food and non-food production and the sectoral composition of employment in a poor rural setting, where utility is highly sensitive to food consumption. They find that motivation for focusing poor rural
areas is twofold. At the inception of the industrial revolution, most societies were rather poor and dominated by agriculture. Currently, diversification beyond agriculture is often considered a promising way out of poverty for poor rural economies. Yet, in many countries, market fragmentation constrains the growth of the rural non-farm sector for which, development initiatives are needed to be taken keeping in view such considerations.

Bell (2009)\(^{24}\) has stated in his article, 'Bumpy Rides on India’s Roads: Field Notes on a Tour of Assam, Himachal Pradesh and Orissa', that the community in Himachal Pradesh enjoys a good standard of living and is heavily commercialized, the principal crop being apple. This could happen due to construction of roads and before that the development scenario of the state was dismal. It is revealed that the villagers are enjoying good access to education and health facilities. However, the author is of the opinion that more emphasis is needed to be drawn upon taking such development initiatives in the State to cover all regions.

Khandker et al. (2009)\(^{25}\) have estimated that the farm-gate price of fertilizers declined by 5 percent. This similarity supports the 'importation' of the estimated (proportional) effect on family consumption in Bangladesh to arrive at the same in Orissa. They find that the development initiatives in the rural areas have come up with good results as the transport costs have much reduced, output and net prices boosted- up with agricultural wages and per capita household consumption. Boys' and girls' schooling rose, too. Where consumption is concerned, the distributional pattern turned out to be favorable, or at least broadly neutral, so that there was a substantial associated reduction in poverty.

Soderbom and Rijkers (2009)\(^{26}\) in their study, “Market Integration and Structural Transformation in a Poor Rural Economy” have suggested both the increase in non-farm output and the increase in the employment in the non-farm sector consistent with historically documented patterns of rural transformation. The authors demonstrate that even in the absence of technological progress, asymmetric sectoral output growth and employment shifts can be induced by trade. Such shifts result in spatial disparities in economic activities that are
qualitatively similar to those conventionally associated with rural transformation.

Gael and Niall's (2009)\textsuperscript{77} study emphasizes that infrastructure upgrade and rehabilitation should not be the only answer to connectivity problems in rural areas; transport services provision should also be looked at in details. The authors advocate that there are two possible major objectives with subsequent different public interventions viz. Ensure motorized service provision (bus/truck) and Ensure non-motorized service provision. In the first case, it has been stated that a mix of public interventions between road investments and service subsidies need to be found and for the later, road level of service (technical standard, width...) should be reduced aiming at ensuring pass ability of intermediate means of transport, which would mean the importance of working exclusively on critical points/obstacles (small bridges etc.) and from an economic perspective, most rural populations are somehow connected to markets. Hence, they conclude that from a public policy perspective, investments in roads might have a lower impact on economic development than expected due to the fact that transport connectivity is only one component of rural development, and sometimes not the most important however, in some countries, poverty reduction has not reduced significantly for which, economic and social data (such as traffic data, vehicle operating costs for minibuses, purpose of minibus usage) need to be collected for policy-makers to decide on which investment choice is required to enable which type of service provision, based primarily on demand assessment.

Yadav (2009)\textsuperscript{78} in this study entitled, "Rural Road Connectivity: A Growth Narrative " has observed that rural economic development is influenced by road connectivity in many ways like poverty reduction, productivity enhancement, improvement in quality of life, improvement in mobility and accessibility, agricultural development and rural industrialization. Finally, the author concluded that there is an inverse relationship between roads connectivity and poverty level and stated that better roads connectivity will lead to lower poverty level and vice-versa.
Tarique (2009) has made an assessment of the role of infrastructural development in his article, ‘Rural Infrastructure and Economic Development’, and concluded that failure to accelerate investment in rural infrastructure will make a mockery of efforts to achieve development goals in the developing countries.

Walle (2009) in the article, ‘Impact Evaluation of Rural Road Projects’, has analyzed the impact of rural feeder roads. Most efforts have been felt ad hoc and few have been sufficiently well-designed to be able to isolate the social and economic impacts attributable to roads. Three main methods are used most commonly to rank transport infrastructure investments, including trunk roads, district roads and primary rural feeder roads by applying multi-criteria analysis (MCA), cost-effectiveness analysis (CEA) and cost-benefit analysis (CBA) and it has been found that a key difference between CBA and CEA calculations is that the later works only in situations where total expenditures for a programme are fixed. Thus, although both CBA and CEA measure the ratio of benefits to cost, the 'benefit' units are different. The author further argues that to put the CEA indicator in a broader context, it would require a comparable measure of the social value of the project outcomes. Giving the instances, the author argues that a number of projects in the World Bank and elsewhere have turned to CEA calculations to take account of a broader set of benefits – such as potential health and education benefits – yet it has been admitted that they avoid the problem of putting a monetary value.

Mulmi (2009) in the study “Green Road Approach in Rural Road Construction for the Sustainable Development of Nepal” has critically examined the road construction using Green road approach in the rural part of Nepal. The objective of the study is to relate the different principles and methodologies adopted by road construction using Green road approach with the universally accepted themes of sustainable development. The author is of the opinion that transport infrastructure provides a basis for economic activities in the rural areas in the long term. But the environment consequences cannot be neglected only foreseeing long term economic benefits. Difficult topography and unstable geology make the road construction difficult in the rural hills of Nepal. Beside,
the predominantly absolute poverty in the region realizes the essence of the appropriate approach in the rural road construction. With its approach of constructing rural roads considering environment and rural poverty alleviation measures, Green road approach is proving to be a sustainable way of constructing rural roads and to provide employment to the rural people.

Warr (2010)\textsuperscript{82}, has expressed in the study, 'Roads and Poverty in Rural Laos' that 13 percent of decline is attributable to the conversion of dry- into all-weather roads. Geographically farther afield, which proves the degree of success of the initiatives taken for constructing roads and consequently steps towards poverty alleviation.

Sahu & Santosh (2013)\textsuperscript{83} in their research article, “Environmental Study of PMGSY Road” reveal that the entire project has predicted adverse significant impacts occurring during roads construction. The impacts are designated to be significant, short-term, and reversible but manageable and most of them can be minimized through engineering solutions easily incorporated into project design. However, it is stated to ensure that Environmental and Social Management Framework (ESMF) and monitoring plans need to be well implemented.
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