Chapter 1

Introduction

1.1. Background

Infrastructure is the real capital stock that contributes to the economic development by increasing productive capacity and by providing amenities that enhance the quality of life. It affects each of the economic activities such as production, consumption, distribution, trade etc directly or indirectly, which have both the positive and negative externalities. Infrastructure can be broadly divided into two types: Physical and Social. The physical infrastructure consists of Transport (Roads, railways, aviation, waterways and ports) electricity, water bodies, irrigation, telecommunication, housing and water supply. All these work as direct intermediate inputs to production. Improvement in these infrastructures firstly, attracts flows of additional resources; secondly, enhances the productive capacity of the economy and thereby the levels of output. Initially, the development of transport, power, and communication is given more importance in several countries. However, the over-all human development is not only related to the economic attainment. Eradication of diseases and ignorance is equally important for human welfare as eradication of poverty, which may be termed as social infrastructure. Thus, Social infrastructure like education, health, sanitation, etc improves the quality of life of the people and their overall well-being.

A number of studies undertaken by different economists have established a linkage between infrastructure and economic development. It has been unanimously accepted that infrastructure is a \textit{sine qua non} for overall economic development. Rostow (1960) opined that creation of infrastructure was one of the important
pre-requisites for driving an economy from its traditional stage to the take-off stage. Brutan (1960) was also of the view that infrastructure had a positive impact on the development of an economy by reducing cost of production through economies of scale and thereby increasing its profitability and overall increase in production, employment and hence further expansion. Ahluwalia (1984) had proved a positive correlation between infrastructure and per capita income of different states of India.

Several studies have examined the role of infrastructure in economic development in various ways; like Kohli, Thakur and Singh (1970) analysed the role of power in economic development, Coyle et al. (1982), Nayak (1999) examined the role of transport and communication on the economy, Rao (1985), Pant and Verma (1983) examined role of irrigation in agricultural sector of a country. Also, Cairncross (1962), Nurkse (1962), Schumpeter (1954) and Joan Robinson (1952) examined the role of banking and finance and Tinbergen (1967), Rao (1985), Kuznets (1971), Sen (1966) and Panchmukhi (1979) unearthed the role of human resource development through education and health care on the economic progress of countries.

Physical infrastructure enhances economic growth, through lower transaction costs, generates multipliers of investment, output and income, subsequently, accelerates economic growth and development. Whereas, social infrastructure improves the productivity of labour through education, health and basic social services, and thereby improves the quality of life. Besides, physical infrastructure such as airports, roads and railways, which was considered as Cross Border Infrastructure (CBI) (Bhattacharyay, 2010) is imperative in promoting regional connectivity, production, trade competitiveness among different economies and thus increases access to regional and global market.
Foreign Direct Investment (FDI) is also another important stimulus to economic growth in a developing country. It has been widely accepted that deficient infrastructure is a barrier to investment climate and therefore restricts flow of Foreign Direct Investment. On the other hand, adequate infrastructure stimulates Foreign Direct Investment (Ang, 2008).

Infrastructure contributes to economic development by increasing productivity, output, income and employment as well as providing basic amenities in enhancing the quality of life was asserted by Ghosh and De (2004). Similarly studies by World Bank (2002), Bougheas et al. (1999), Kumar (2002) Esfahani and Ramirez (2003), Yoshino and Nagahigashi (2000), (Ratner, 1983; Aschaver, 1989 and Nakazato, 1999) and Seethepalli, Bramait and Veradas (2008) have emphasized the role of infrastructure on output, income and employment opportunity and quality of life across the countries.

Infrastructure development also plays an important role in promoting inclusive economic growth by increasing accessibility of poor people in remote isolated areas and land locked countries to basic services and helps in generating income capacity (Bhattacharyay, 2010). It, particularly road transport and electricity helps in promoting economic growth and reducing poverty (UNESCAP, 2006). Basic infrastructure is the key inputs for economic growth that improves socio-economic conditions by providing basic needs and utilities, and enhances physical connectivity both within and among countries and facilitates movement of goods and services (Bhattacharyay, 2008).

There is no doubt that provision of adequate Infrastructure in rural areas has positive impacts on social and economic development. It also helps in reducing rural poverty and improvement in the quality of life. For example construction of roads,
bridges etc, water tanks, schools, health centres, irrigation facilities on the one hand generate direct as well as indirect employment opportunities and on the other hand create assets for rural masses and thus enhance their level of income and make them more productive. For instance, The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREA) is a job guarantee scheme of the central government of India for the people living in rural India.

1.2. **Transport Infrastructure**

Within infrastructure, transport and communication plays a crucial role in the political, economic and social development of any society, whether rural or urban. Transportation constitutes the main avenue through which different parts of the society are linked together. As the number of population and their activities in a society grows, the need for interaction among its various components also grows thereby requiring quality and effective transportation systems. In the words of Munby (1968) “there is no escape from transport even in the most remote and least developed of inhabited regions”. Also, Hailey (1957) opined that “there seems to be no other types of development which can effect so speedily a change in the economic and social conditions of backward nations except transport”.

Similarly, Hirschman (1958) classifies transport infrastructure systems as “Social Overhead Capital (SOC)” to distinguish it from the type of capital that is used directly by industry to produce their goods and services (e.g., plant and equipment), which he calls “Directly Productive Assets (DPA)”. Hirschman points to four characteristics that distinguish SOC from DPA: (1) SOC is basic to (and facilitates) a great variety of economic activities, (2) it is typically provided by the public sector or by regulated private agencies, (3) it cannot be imported, and (4) it is “lumpy” in the
sense of technical indivisibilities. He also argues that the function of SOC investment is to “ignite” DPA, and that “Investment in SOC is advocated not because of its direct effect on final output, but because it permits, and in fact, invites, DPA to come in.”

Limao and Venables (1999) showed that transport infrastructure is a significant determinant of transportation costs. Using infrastructure index combining road, rail, and telecommunications densities and their finding revealed that the high transportation cost and poor trade performance in Sub-Saharan Africa during the last part of 20th Century was due to the poor transport and communication infrastructure.

According to Deb and De (2004) improved transport infrastructure facilitates faster mobility of labour, materials and goods. Besides, it enhances access to market and healthcare services. In India, states with better transport facilities have higher literacy rates and lower infant mortality rates. Transport facilities affect accessibility according to the availability of different modes of transport services and thereby travel time, cost and comfort (Vickerman et al., 2010).

Inadequate transport infrastructure has social impact in preventing access to key local services or activities such as jobs, learning and healthcare, which, in turn, may lead to social exclusion of particular groups (Geurs et al., 2008). There is thus a positive correlation between transport infrastructure or inter-regional accessibility and economic indicators such as GDP per capita (Biehl, 1986; Keeble et al., 1988 cited in Vickerman et al., 2010).

Transport infrastructure is found to influence cost and productivity of firms, attract foreign firms and hence the inflow of Foreign Direct Investment (Khadoroo and Seetanah, 2009; Loree and Guisinger, 1995; Kinoshita, 1998; Escribano and Guasch, 2005).
It is apparent that transportation plays a multifaceted role in the pursuit of development objectives. Inadequate transportation limits the mobility of factor inputs, both human and material resources to places where they can be employed productively. Further a good transport system helps to attain an efficient distribution of population, industry and income. Moreover, it helps in improving accessibility to schools and reducing drop-out, enhances medical and social services that greatly affect the day to day lives of rural people. It also reduces the incidence of food insecurity and thus improves the overall quality of life of rural masses.

1.3. Road Infrastructure

Road is the subset of transport infrastructure that connects various places and facilitates communication across the districts, towns, localities or villages and accelerate the mobility of people, goods and services as well as trade activities. An adequate road infrastructure network also provides an advantage to a country in terms of improved regional integration, which helps to promote regional and international trade and significantly enhances the economic growth and development of that country. Road infrastructure is regarded as the most important factor in socio-economic development of the country, enhancing interaction among geographical and economic regions by reducing disparity of rural and urban development, opens up economic and social opportunities and greater accessibility to basic social infrastructures. Besides, it helps creating market for agricultural produce, increases the level of consumption and production, in addition to reduction in rural and urban poverty. Ogunsanya (1988) showed the relationship between road transport and rural characteristics and he stressed that the greater the degree of rural features, the lower the level of road transport. Similarly, Aderamo and Magaji (2010) noted that different
parts of the society are linked together through road transport. Ajiboye and Afolayan (2009) and Tunde and Adeniyi (2012) showed how road transport enhances mobility of goods and passengers. According to Mabogunje (1971) easy accessibility and mobility are some variables that determine the level of development.

Road can be defined as a wide way leading from one place to another for the passage of vehicles, peoples and animals. Road can be classified as (a) National Highways (b) State highways (c) District Highways (i.e. Major District road and Minor District road) and (d) Village road. Further, on the basis of quality, road can be classified as (a) Surfaced road (b) Unsurfaced/kaccha road (c) one lane or two lanes and (d) four lanes road etc.

In most of the developing countries, a sizeable number of populations reside in rural areas with poor connectivity. Geographical isolation and inaccessibility make most remote areas backward, poor and underdeveloped. Thus, it is widely accepted that provision of rural road network is imperative for development and growth of rural areas. Hirschman (1958) cited in Bryceson et al. (2006) argued that roads should be considered a necessary component of infrastructural investment to generate development in remote areas.

That is why the Government of India undertook a scheme of Pradhan Mantri Gram Sadak Yojana (PMGSY) (2000) to improve rural road network in a systematic fashion. Specific goal of PMGSY was to connect to all rural communities with a population of greater than 1000 by motorable road by 2003, and to all communities with a population of greater than 500 by 2007. However, there are still some ways to go to achieve the target as we see various places are still unconnected especially in remote places of North-Eastern part of India.
Road investment as rural development objectives was emphasized by western donors, as such rural roads gained significance in World Bank lending to transport infrastructure that would enhance rural produce, mobility, marketing and accessibility to basic social services (Barwell and Howe, 1979; Edmonds, 1998 cited in Bryceson et al., 2006). Besides, availability of good road connectivity determines income diversification through employment opportunity on non-farm activities, where rural masses can have more choices to choose their employment not only within their villages but move out to nearby villages or towns as casual labour for construction of houses, buildings, roads, bridges etc. Opening up of new business venture like food/tea stalls rest houses and fuel stations along the main roads or highways connecting to different villages or towns and as such enhances employment opportunities. Furthermore, many studies have highlighted the importance of rural roads on farm and non-farm employment opportunities and improvement in quality of life of rural households (Yunusa, 2002; Ogunsanya and Ojetola, 1993; Aderamo and Omolaran, 2006 and Aderamo and Magaji, 2010 cited in Usman et al., 2013).

Thus, investments on road can help the poor in a number of ways, and one of the most important is through their impact on the rural non-farm economy. For example, rural road investments can promote the development of small non-farm enterprises, which in turn can increase the demand for rural labour. Fan and Rao (2002) found that non-farm employment became increasingly important in helping the poor in rural areas during the post-green revolution period in many Asian countries. Malmberg (1997) and Escobar (2001) emphasised the positive effect of rural road infrastructure for the poor in enhancing non-farm employment or income diversification and wages.
Of course, there are some negative impacts of developing rural road infrastructure like rise in rural-urban migration, disruption of ecological balance of some areas during road construction. But, the advantages of provision and availability of good road connectivity are far greater than the non-availability of road infrastructure (Umoren et al., 2009).

1.4. Statement of the Problem

In Meghalaya, road infrastructure is the only form of transportation that connects with other states in the country as well as to different districts, towns and villages. Provision of adequate and quality road network is imperative for linking the villages to district headquarters and town enhancing mobility and expansion of local markets, increases agricultural produce, speeds up the transportation of goods, enhances employment opportunities and development of local economy. Besides, adequate road network helps remote villagers to have easy access to basic social infrastructures like schools and health care facilities in district headquarters and town.

The road density per 100 sq km in Meghalaya was 33.88 km on 1st April 2008, which was far below the national average of 100 km per 100 sq km. About 60.10 per cent of roads in the state are surfaced and the remaining 39.90 percent are still un-surfaced roads. Till 2008, 2578 numbers of habitations out of total 5782 habitations in the state were yet to be connected by motor-able roads.

Almost 50 per cent of the villages in Meghalaya was unconnected by all weather roads till 2008. It reflects the poor quality of road connectivity in the State. According to Meghalaya Human Development Report 2008 almost all the Garo hills districts are not well connected by pucca road, which was followed by Ri Bhoi District, West Khasi Hills and East Khasi Hills Districts.
Table 1.1: Category-wise Distribution of Road in Meghalaya during 2001-02 to 2009-10 (Km)

<table>
<thead>
<tr>
<th>Year</th>
<th>National Highway (Km)</th>
<th>State Highway (Km)</th>
<th>Major District Roads (Km)</th>
<th>Other District Roads (Km)</th>
<th>Village Roads (Km)</th>
<th>Urban Roads (Km)</th>
<th>Total (Km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-02</td>
<td>520(6.84)</td>
<td>991(13.04)</td>
<td>806(10.60)</td>
<td>5281(69.50)</td>
<td>NA</td>
<td>NA</td>
<td>7598</td>
</tr>
<tr>
<td>2002-03</td>
<td>520(6.94)</td>
<td>829(11.06)</td>
<td>1268(16.92)</td>
<td>4873(65.06)</td>
<td>NA</td>
<td>NA</td>
<td>7490</td>
</tr>
<tr>
<td>2003-04</td>
<td>606(7.88)</td>
<td>1124(14.63)</td>
<td>1229(15.99)</td>
<td>3064(39.88)</td>
<td>NA</td>
<td>NA</td>
<td>7682</td>
</tr>
<tr>
<td>2004-05</td>
<td>606(7.69)</td>
<td>1134(14.39)</td>
<td>1229(15.60)</td>
<td>3274(41.56)</td>
<td>NA</td>
<td>NA</td>
<td>7877</td>
</tr>
<tr>
<td>2005-06</td>
<td>606(8.56)</td>
<td>1137(11.06)</td>
<td>1219(17.22)</td>
<td>5019(70.90)</td>
<td>NA</td>
<td>NA</td>
<td>7978</td>
</tr>
<tr>
<td>2006-07</td>
<td>603(7.57)</td>
<td>1137(14.28)</td>
<td>1219(15.31)</td>
<td>5001(62.82)</td>
<td>NA</td>
<td>NA</td>
<td>7960</td>
</tr>
<tr>
<td>2007-08</td>
<td>603(7.38)</td>
<td>1137(13.92)</td>
<td>1219(14.93)</td>
<td>5205(63.75)</td>
<td>NA</td>
<td>NA</td>
<td>8164</td>
</tr>
<tr>
<td>2008-09</td>
<td>793(9.25)</td>
<td>1134(13.23)</td>
<td>1219(14.22)</td>
<td>3439(40.13)</td>
<td>1789(20.88)</td>
<td>194(2.26)</td>
<td>8568</td>
</tr>
<tr>
<td>2009-10</td>
<td>793(9.25)</td>
<td>1134(13.23)</td>
<td>1219(14.22)</td>
<td>3439(40.13)</td>
<td>1789(20.88)</td>
<td>194(2.26)</td>
<td>8568</td>
</tr>
</tbody>
</table>

Source: P.W.D. (R&B), Meghalaya.
Note: NA = Information not available. Figures in parentheses indicate percentage of different categories of road out of total road length.

Table 1.2: Road Length and Road Density in Meghalaya during 2001-02 to 2009-10 (Km)

<table>
<thead>
<tr>
<th>Year</th>
<th>Surfaced (Km.)</th>
<th>Unsurfaced (Km.)</th>
<th>Total (Km.)</th>
<th>Road Density Per 100 Sq km</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-02</td>
<td>3523(46.36)</td>
<td>4075(53.63)</td>
<td>7598</td>
<td>33.88</td>
</tr>
<tr>
<td>2002-03</td>
<td>4280(57.14)</td>
<td>3210(42.85)</td>
<td>7490</td>
<td>33.39</td>
</tr>
<tr>
<td>2003-04</td>
<td>4498(58.55)</td>
<td>3184(41.44)</td>
<td>7682</td>
<td>34.25</td>
</tr>
<tr>
<td>2004-05</td>
<td>4614(58.57)</td>
<td>3263(41.42)</td>
<td>7877</td>
<td>35.12</td>
</tr>
<tr>
<td>2005-06</td>
<td>4721(59.17)</td>
<td>3257(40.82)</td>
<td>7978</td>
<td>35.57</td>
</tr>
<tr>
<td>2006-07</td>
<td>5908(74.22)</td>
<td>2051(25.76)</td>
<td>7960</td>
<td>35.49</td>
</tr>
<tr>
<td>2007-08</td>
<td>5983(73.28)</td>
<td>2181(26.71)</td>
<td>8164</td>
<td>36.39</td>
</tr>
<tr>
<td>2008-09</td>
<td>5581(65.13)</td>
<td>2986(34.85)</td>
<td>8568</td>
<td>38.20</td>
</tr>
<tr>
<td>2009-10</td>
<td>5581(65.13)</td>
<td>2986(34.85)</td>
<td>8568</td>
<td>38.20</td>
</tr>
</tbody>
</table>

Source: P.W.D. (R&B), Govt. of Meghalaya.
Note: Figures in parentheses indicate percentage of surfaced and unsurfaced roads out of total road length.

As shown in Table 1.1 for a period of ten years (2001-2010) the share of different categories of roads in the state is inadequate, where the share of other districts roads has gone down from 69.50 per cent in 2001-02 to 40.13 per cent in 2009-10. Similarly, as reflected in Table 1.2, road density per 100 sq km in Meghalaya was 33.88 in 2001-02 and increased only to 38.20 in 2009-10 and the total road length increased from 7598 km in 2001-02 to 8567 km in 2009-10, an increase of only 969 km. About 35 percent of total road length in the state in 2009-10 still
remained unsurfaced. Thus, Meghalaya has been chosen as an area of study with a special emphasis on East Khasi and West Khasi Hills’ Districts.

1.5. Objectives of the Study

The objectives of the study are:

1. To assess how expansion of road connectivity in rural areas of Meghalaya helps in improving the economic condition of the villagers through the enhancement of linkage between rural villages and towns/district headquarters, reducing transportation cost and increasing employment opportunities.

2. To examine the impact of road connectivity on the spatial variation in agricultural prices, agricultural wages in Meghalaya.

3. To analyze if the availability of good roads in rural areas improve the health condition of the rural masses, educational status of the villagers in the study area.

4. To assess the impact of road infrastructure on the implementation and performance of various rural government developmental programmes and accessibility to various amenities in the study area.

1.6. Hypotheses

The following hypotheses are tested in the study.

1. Condition of road infrastructure affects the employment opportunity and income of the villagers.

2. Improvement of road connectivity improves health and educational status of the people and thereby the quality of human resource.

* Blocks and villages falling previously under erstwhile West Khasi Hills District are now under the newly created district of South West Khasi Hills.
3. Provision of adequate and quality road connectivity enhances the implementation of various developmental programmes and accessibility to various amenities in rural areas.

1.7. Scope of the Study

The dissertation is divided into six chapters. Besides Chapter-1, that includes an introduction to the research problem related to infrastructure, road transport and socio-economic development, Chapter-2 provides a review of available literature and methodology of the study undertaken. Chapter-3 describes the status of road infrastructure in India and North-Eastern states and its growth over time. A description of spatio-temporal variation in road infrastructure in Meghalaya and socio-economic characteristics of the sampled households in the study area has been highlighted in Chapter-4. Chapter-5 provides statistical analysis of development of road infrastructure and its impact on agriculture, education, health, accessibility to various amenities and developmental schemes. Finally, the conclusions and policy implications emanated from the study are given in Chapter-6.

References


*Paper Presented at Institute of Economic Growth. Silver Jubilee Seminar.*

Delhi.


