Infrastructure Development and Economic growth: Prospects and Perspective

Dr. B. Srinivasu, Assistant Professor, Dept. of Economics, Jamia Millia Islamia, New Delhi, India
P. Srinivasa Rao, PhD Research Scholar, Dept. of Economics, Jamia Millia Islamia, New Delhi, India

ABSTRACT
Infrastructure is the prerequisite for the development of any economy. Transport, telecommunications, energy, water, health, housing, and educational facilities have become part and parcel of human existence. It is difficult to imagine a modern world without these facilities. These are vital to the household life as well as to the economic activity. Infrastructure plays a crucial role in promoting economic growth and thereby contributes to the reduction of economic disparity, poverty and deprivations in a country. Greater access of the poor to education and health services, water and sanitation, road network and electricity is needed to bring equitable development and social empowerment. It is an important pre-condition for sustainable economic and social development. Infrastructural investments in transport (roads, railways, ports and civil aviation), power, irrigation, watersheds, hydroelectric works, scientific research and training, markets and warehousing, communications and informatics, education, health and family welfare play a strategic but indirect role in the development process, but makes a significant contribution towards growth by increasing the factor productivity of land, labour and capital in the production process, especially safe drinking water and sanitation, basic educational facilities strongly influence to the quality of life of the people. This study establishes the relationship between infrastructure and economic growth using growth theories by empirical evidences. Finally it concludes infrastructure and poverty reduction in the Indian context.

Keywords: Infrastructure, Growth and Development, Infrastructural Investments, Poverty Reduction

INTRODUCTION
Infrastructure investment is an important driving force to achieve rapid and sustained economic growth. The presence of sufficient infrastructure will require for the modernization and commercialization of agriculture and the achievement of income surpluses for capital accumulation. It can provide a basis for the expansion of local manufacturing industries, as well as enlarging markets for the outputs of these industries. Many studies have found a positive relationship between the level of economic development (measured by per capita income and other indicators), and quality of housing and access to basic amenities like electricity, safe drinking water, toilets (Human Development Report of India 2011). There is a precise link between infrastructure and development. Infrastructure investment directly affects the economic development. Therefore, that the only way to build up a country’s productive potential and raise per capita income is to expand the capacity for producing goods, this need not refer simply to the provision of plant and machinery, but also to roads, railways, power lines, water pipes, schools, hospitals, houses and even “incentive” consumer goods such as consumer durables, all of which can contribute to increased productivity and higher living standards.

The prosperity of a country depends directly upon the development of Agriculture and Industry. Agriculture production, however, requires power, credit, transport facilities, etc. Industrial production requires not only machinery and equipment but also skilled manpower, management, energy, credit facilities, marketing facilities, transportation services which include railways, roads, shipping, communication facilities, etc. All these facilities and services constitute collectively the infrastructure of an economy. Regions with inadequate infrastructure usually have lower per capita income, bigger proportion of the primary sector, and smaller population density. Regions with high infrastructure level usually have higher per capita income, a smaller proportion of the primary sector and bigger population density. In which regions having a good basic facilities like health, educational, transport, communication, water, sanitation, energy, housing, etc. it will attract more investments especially the small and marginal entrepreneur starts their production activities. Good transportation, low cost of electricity, availability of skilled lobar facilities always negative effects on the cost of production, positive effects on production as well as profit levels. Inadequate infrastructure and services become the burden for infrastructure suppliers, and led the low efficiency of output. World Development Report (1994) published by the World Bank under the title ‘Infrastructure for Development’ rightly mentions that “the adequacy of infrastructure helps determine one country’s success and another’s failure in diversifying
production, expanding trade, coping with population growth, reducing poverty, or improving environmental conditions.” Socioeconomic development can be facilitated and accelerated by the presence of social and economic infrastructure. It has been universally recognized that an adequate supply of infrastructure services is an essential ingredient for productivity and growth. If these facilities and services are not available in that place development will be very difficult, it will lead negative effect on the production activities of the economy, which means lower levels of production capacity is always leads to the under utilization of the resources, scarcity of goods and services. People will spend more money for obtaining basic needs and facilities. It can be linked to a very scarce commodity that can only be secured at a very high price and costs. The pursuit of higher level of welfare for the citizens of countries in the era of globalization requires efficiency, productivity and growth in all spheres of economic activities. A well-functioning infrastructure including, electric power, road and rail connectivity, telecommunications, air transport, and efficient ports required for rapid growth. Without any of these either economic production will suffer or the quality of life will deteriorate. One could thus view these activities as essential inputs to the economic system. In this respect, adequate and efficient infrastructure is crucial because of its impact on efficiency and growth of other economic activities, and in turn, on the welfare of the society. Apart from growth linkages, infrastructure has a direct relationship with environment, health, poverty, equity and the general quality of life. The higher affluence of the developed countries with advanced infrastructure bears testimony to this relationship.

CONCEPT OF INFRASTRUCTURE

Infrastructure, in general, defines as a set of facilities through which goods and services are provided to the public. Its installations do not produce goods and services directly but provide inputs for all other socio-economic activities. Infrastructure is the stock of basic facilities and capital equipment needed for the functioning of a country or area; the term to refer collectively to the roads, bridges, rail lines, and similar public works that are required for an industrial economy, or a portion of it, to function. The term originated during the World War II as a military term to mean ‘underlying’ structures in the early days of Marshall Plan, as preferable to Social Overhead Capital1, to avoid confusion with hospitals, schools and similar welfare type facilities. Since then, the term has been widely used by economists but does not have a precise definition till now. Different economists have used the term with different connotations, without, however, sacrificing the basic idea that they provide the base over which the structure of the economy is built. Consequently, there have been efforts to encompass a variety of activities within in the term infrastructure like differentiating between different components of infrastructure (social and economic, for example). The foremost reference to the concept of infrastructure was by A. O. Hirschman. (1958). He differentiated between Direct Productive Activities (DPA) and Social Overhead Capital (SOC). The SOC can be seen as infrastructure and is usually defined as comprising “those basic services without which primary, secondary and tertiary productive activities cannot function”

NEED FOR THE STUDY

Every economy either developing or developed has two kinds of main basic objectives one providing basic needs and facilities to their population second achieving higher growth rates. The present paper provides how infrastructure impacts growth and development. How infrastructure plays a dynamic role to fulfill their growth targets as well as achieving higher living standards of their mass population.

OBJECTIVES OF THE PAPER

The objectives of the present study

- To examine the theoretical framework of infrastructure.
- To analyse the socio economic relationship between infrastructure development and economic growth.

METHODOLOGY

The present study based on the secondary data, collected from the different sources like World Development Reports of various years, Human Development Report of India (2011), majority of data and literature collected from the existing growth theories, empirical studies. Particularly this study is not related to any region, state but its concern India’s socio economic perspective. Why infrastructure is more important other than the growth determinants and how infrastructure influences the different sectors of the economy, than it studied the global and Indian experience of infrastructure and growth through empirical evidences and establish the relationship between infrastructure and growth.

THEORITICAL FRAMEWORK

The provision and development of Infrastructure has been subject of much theoretical analysis and empirical studies. It is referred as an umbrella term for many activities and named as “Social
Overhead Capital”, “Economic Overheads”, “Overhead Capital”, “Basic Economic Facilities”, and so on. Nurks elaborated the concept of overhead capital. According to him “overhead investment aims at providing the services – transport, power, and water supply, which are basic for any productive activity, cannot be imported from abroad, required large and costly installations and in the history of western economics outside England, have usually called for public assistance or public enterprise. Typically overhead investments take a considerable time to reach maturity in growing. To be sure, all investments depend on expectations but the time range of expectations is opt to be particularly long in overhead projects because of their lumpiness combined with their high operational capital intensity. Other development economists like Rostow and Hirschman have also used the word of social overhead capital.

W. W. Rostow (1960) in his 'Theory of Stages of Growth' According to him SOC is a pre-condition for take-off into self-sustained growth. Investment in SOC and development of those services encourages potential entrepreneurs to invest in risk-bearing business. Those SOC prepare the base for expansion of economic activities by decreasing the cost and increasing the profitability of productive activities. It also helps in the creation of an educated labour force, superstructures of communication networks, and mechanism to provide energy, basic civic amenities and law and order. According to Rostow, “All these create an atmosphere that breeds entrepreneurial capabilities and sustains a climate which is throbbing with economic activities and optimistic decision.” Consequently, he made investments in SOC, especially in the fields of transport and power, one of the main preconditions for take-off. In the precondition to take – off stage the investment in social overhead capital should create literate and technically trained personnel in the working force. They are necessary condition for self sustaining economic growth.

Hirschman’s concept of social overhead Capital (Infrastructure) Comprises of these basic services (include all public services like transportation, communication, power, health, water supply, irrigation and drainage system) without which the primary, secondary and tertiary activities in the economy cannot function. In its wider sense, it includes all public services from law and order through education and public health to transportation communications, power and water supply, as well as such agricultural overhead capital as irrigation and drainage system. The hard core of the concept can probably be restricted to transport and power. Hirschman (1958):

According to the theory of unbalanced growth by Hirschman no LDC has a sufficient endowment of resources as to enable it to invest simultaneously in all sectors of the economy in order to achieve balanced growth. Hirschman maintains that investments in strategically selected industries or sectors of the economy will lead to new investment opportunities and so pave the way for further economic development. He stresses that development to take place a deliberate strategy of unbalancing the economy should be adopted. This is possible by investing either in social overhead capital or indirect productive activities. Investments in social overhead capital are advocated not because of its direct effect on the final output, but it permits and invite DPA to come in some SOC is required as a prerequisite of DPA investment. According to Hirschman an activity can be included in the category of social overhead capital (Infrastructure) provided it satisfies the following conditions:-

- The services provided by the activity facilitate or are in some sense basic to the carrying on of a great variety of economic activities.
- These services are usually provided in practically all countries by public agencies because of externalities, or by private agencies subject to some public control. They are provided free of charges or at rates regulated by public agencies.
- These services cannot be imported.
- These investments needed to provide the services are characterized by
- Lumpiness (technical indivisibilities) as well as by a high degree of capital-output ratio (provided the output is at all measurable).

Hirschman’s point of view was that the enlarged availability of electric power and transportation facilities are essential preconditions for economic development. Rosenstein Rodan. The services of overhead capital are indirectly productive and become available only after a long gestation period. They include all those basic industries like power, transport or communication. Their investments precede directly productive investments. They constitute the framework and overhead costs of the economy as a whole. Its installations are characterized by a sizeable initial lump and low variable cost. The increase in overhead costs and fixed capital since the nineteenth century has raised the risk of loss of capital and lowered the mobility of resources and flexibility of the economic system. It has vastly increased the average size of the firm. According to Rodan views on industrialization and economic development, National and international investment should concentrate at the start on building of “basic industries” and public utilities which give rise to new investment opportunities.
“Let us build railways, roads, canals, hydroelectric power-stations, the rest will follow automatically.” where the lack of transport facilities is a flagrant obstacle to economic progress, as for instance, in China and parts of Latin America, that may indeed be the best start of development investment. If sufficient capital is available for investment in basic industries the normal Multiplier effect will “naturally” lead to further industrialization. Hansen (1965), in looking at the role of public investment in economic development, divides public infrastructure into two categories Economic Overhead Capital (EOC) and Social Overhead Capital (SOC). EOC is oriented primarily toward the direct support of productive activities or toward the movement of economic goods and includes most of the public works projects listed above. SOC is designed to enhance human capital and consists of social services such as education, public health facilities, fire and police protection, and homes for the aged. Other classifications of public infrastructure include investments by the private sector. Hansen theorizes that the potential effectiveness of economic overhead capital will vary across three broad categories of regions: congested, intermediate, and lagging. Congested regions are characterized by very high concentrations of population, industrial and commercial activities, and public infrastructure. Any marginal social benefits that might accrue from further investment would be outweighed by the marginal social costs of pollution and congestion resulting from increased economic activity. Intermediate regions are characterized by an environment conducive to further activity an abundance of well-trained labor, cheap power, and raw materials. Here, increased economic activity resulting from infrastructure investment would lead to marginal social benefits exceeding marginal social costs. Lagging regions are characterized by a low standard of living due to small-scale agriculture or stagnant or declining industries. The Economic situation offers little attraction to firms, and public infrastructure investment would have little impact. Kindleberger and Herric (1973) however, while defining infrastructure introduced two more concepts such as Economic Overhead Capital (EOC) and Strictly Social Overhead Capital (SSOC) which are two different components of Social Overhead Capital. According to them EOC are nothing but public utilities in the form of transport, communication, road, railways, electricity, etc. whereas SSOC includes the plants and equipments required for providing services in the form of education, health and housing. According to development economist Michael P. Todaro (1981) Emphasis capital accumulation including all new investments in land, physical equipment and human resources, results when some proportion of present income is saved and invested in order to augment future output and income. New factories, machinery equipments and materials increase the physical “capital stock” of a Nation (i.e. the total “net” real value of all physical products capital goods) and make it possible for expanded output levels to be achieved. These directly productive investments are supplemented by investments in what is often known as social and economic “Infrastructure” roads, electricity, water, and sanitation, communications etc. Which facilitate and integrate economic activities for example investment by a farmer in a new tractor may increase the total output at the vegetables he can produce, but without adequate transport facilities to get this extra product to local commercial markets, his investment may not add anything to national food production. To sum up all the above economists views on infrastructure in the form of overhead capital or overhead costs. This was the theoretical base of socio economic infrastructure of the economy. Since Ashauer (1989) around the world numbers of studies were conducted by the different economists in different time Spain periods. Through the empirical testing of infrastructure really influences growth and development. For example during the 1970s, there was a high correlation between declining productivity in the USA and reductions in investment on public infrastructure, numerous studies have suggested that infrastructure investment is likely to augment economic performance. For a review (see Ashauer1989, Gramlich 1994). This implies that increasing the investment in infrastructure can enhance productivity growth as well as quality of life. Assets (e.g. Easterly and Rebelo 1993, Canning and Fay, 1993, Canning, 1999) using cross section-time series pooled data found that public infrastructure has positive effects on a country’s productivity performance as well as growth is affected positively by the stock of infrastructure. In a large exercise, 102 cross country studies were assessed by Fuente and Estache (2004) Table.1 shows the distribution of the study findings. Studies conducted over the past 15years, few years
find that infrastructure investment has a negative effect on productivity or growth. The sample includes 30 studies of multiple countries (including developing countries), 41 studies on the United States, and 19 on Spain, 12 on individual developing countries (Argentina, Brazil, Colombia, India, and the Philippines). The study found that in a majority of these country studies, the impact of infrastructure on both growth and poverty reduction was positive, while in the case of 12 developing country studies this linkage was a hundred per cent. The role of investment in infrastructure in developing countries shows that these countries have underinvested in infrastructure, and further that any investment here has the most significant impact on pro poor growth and direct impact on reducing poverty, apart from providing the poor with critical services. Another important study conducted by the World Bank Economist Stephane Straub (2008) a sample of 80 different specifications from the existing 30 macro-level empirical literature on the link between infrastructure and development outcomes in a critical light. These macro level studies, realized between 1989 and 2006, that include some measure of infrastructure as an independent variable and some measure of economic performance (output level or growth, productivity level or growth) as dependent variable. Overall a little over half of them (45, equivalent to 56%) find a positive and significant effect of infrastructure, while 30 (38%) find no effect and 5 (6%) find a negative and significant effect. The major findings of the study, a number of stylized facts emerge from this initial view of the data. Overall, positive effects of infrastructure are found more often in the sample of developed countries, and when the dependent variable is output level rather than output growth or productivity. As for the independent variable, more conclusive results are obtained by studies using physical indicators rather than measures of public capital. Within these categories, looking at the specific sectors for which more than a few studies are included, positive effects are found mostly for telecom, roads and electricity in that order. Finally, studies based on a production function framework reach more positive conclusion that those relying on cross-country regressions.

<table>
<thead>
<tr>
<th>Area studied</th>
<th>No. of studies</th>
<th>percentage shown a positive effect</th>
<th>Percentage shown no significant effect</th>
<th>percentage showing a negative effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple countries</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>10</td>
</tr>
<tr>
<td>United states</td>
<td>41</td>
<td>41</td>
<td>54</td>
<td>5</td>
</tr>
<tr>
<td>Spain</td>
<td>19</td>
<td>74</td>
<td>26</td>
<td>0</td>
</tr>
<tr>
<td>Developing Countries</td>
<td>12</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total/Average</td>
<td>102</td>
<td>53</td>
<td>42</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: de la Fuente and Estache (2004)

Table-2: Estimates of Output Elasticity of Infrastructure Indicators

<table>
<thead>
<tr>
<th>Country /Region</th>
<th>Author</th>
<th>Output Elasticity of Infrastructure</th>
<th>Infrastructure Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>Aschauer (1989)</td>
<td>0.39</td>
<td>Public capital</td>
</tr>
<tr>
<td>USA</td>
<td>Munnell (1990)</td>
<td>0.34</td>
<td>Public capital</td>
</tr>
<tr>
<td>Mexico</td>
<td>Shah (1992)</td>
<td>0.05</td>
<td>Transport, power &amp; communication</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Uchimura and Gao (1993)</td>
<td>0.24</td>
<td>Transport, Water &amp; communication</td>
</tr>
<tr>
<td>Korea</td>
<td>Uchimura and Gao (1993)</td>
<td>0.19</td>
<td>Transport, Water &amp; communication</td>
</tr>
<tr>
<td>DCs</td>
<td>Easterly and Rabelo (1993)</td>
<td>0.16</td>
<td>Transport &amp; Communication</td>
</tr>
<tr>
<td>USA</td>
<td>Gracia Mila et al.(1996)</td>
<td>0</td>
<td>Public capital</td>
</tr>
<tr>
<td>LDCs</td>
<td>Devarajan et al. (1996)</td>
<td>Negative</td>
<td>Transport &amp; Communication</td>
</tr>
</tbody>
</table>
Canada  Wylie (1996)  0.31  Public capital  
Cross-Country  Canning (1999)  -0.23 to 0.22  Road, Telephone and Electricity  
USA  Duggall et al (1999)  0.27  Public capital  
Cross- Country  Calderon & Serven (2003)  0.16  Transport & Communication  
Cross -Country  Esfahani and Ramers (2003)  0.12  Power and Telephones  
OECD Countries  Kamps (2004a)  0.22  Public capital  
South Africa  Fedderke, Perkins, Luiz (2006)  -0.66 to 0.20  Physical capital stock  
India  Sahoo and Dash (2009)  0.4 to 0.5  Physical capital stock  
South Asia  Sahoo and Dash (2010)  0.26 to 0.3  Physical capital stock  
China  Sahoo, Dash, Natraj (2010)  0.27 to 0.35  Physical capital stock  

Source: Sahoo, Pravakar (2011)

INFRASTRUCTURE DEVELOPMENT AND ECONOMIC GROWTH: LINKAGES

 Provision and maintenance of adequate infrastructure facilities are absolutely necessary if rapid economic growth is to be achieved and sustained. The availability of infrastructure like power, telecommunication and transport is absolutely vital for accelerated development and modernization of a country. “The link between infrastructure and development is not a once for all affair, it is a continuous process and progress in development has to be preceded, accompanied and followed by progress in infrastructure, if are to fulfill our declared objectives of self accelerating process of economic development.” (Dr. V. K.R.V. RAO) An infrastructural facility both economic and social constitutes the core of development strategy and efforts. Efficient and affordable infrastructural services are key bone to the higher productivity and output growth. Energy, transportation, electricity, telecommunication, availability of skilled labors, technical and general education, health facilities, agricultural and rural infrastructure like rural roads, irrigation facilities, fertilizers and pesticides, credit facilities, availability markets all the social and economic infrastructure services are made positive and strong impacts on output growth of as well as eliminates the poor performance the different sectors of the economy.

 The linkage between infrastructure and economic growth is multiple and complex, because not only does it affect production and consumption directly, but it also creates many direct and indirect externalities, and involves large flows of expenditure thereby creating additional employment. In this framework infrastructure affects output in two ways. One is the direct channel where infrastructure increases the output by reducing the cost of intermediate goods. The other channel is through externality effect. This channel works through higher human capital returns due to education, good quality health and higher efficiency of human capital due to lower marginal depreciation of capital. The experience across the world has shown that increase in stock of infrastructure is associated with the increase in output and the quality of life of the people. Fulfill and achieve the objective of economic and non economic dimensions of the development especially the standards of living and quality of the life of the people is directly depends on the availability infrastructural facilities. Progress in the developing countries will require a combination of three elements: maintaining high rates of growth in incomes; modifying the pattern of growth so as to raise the productivity and incomes of the poorer sections of the population; and improving the access of the poor to essential public services. The poor suffer not only from low incomes but also from inadequate access to public services essential to their health and productivity. As many of these services, such as sanitation and water supply, cannot be privately purchased, an expanded public program for wider distribution of services must be an important element of strategies to alleviate poverty. Evidence and analysis shed some light on the magnitude of the impact of infrastructure on economic development, defined in these ways. World Development Report (1994) on the vital role of infrastructure in growth has been reinforced by subsequent research for
example on Africa’s economic performance. Not only does development of infrastructure services contribute to growth, but growth also contributes to infrastructure development, in a virtuous circle. Moreover, investments in human capital and in infrastructure interact, each increasing the returns to the other. Identified the various channels through which investment in infrastructure can contribute to growth. These are:

- Reducing transaction costs and facilitating trade flows within and across borders;
- Enabling economic actors individuals, firms, governments to respond to new types of demand in different places;
- Lowering the costs of inputs for entrepreneurs, or making existing businesses more profitable;
- Creating employment, including in public works (both as social protection and as a counter-cyclical policy in times of recession);
- Enhancing human capital, for example by improving access to schools and health centers; and
- Improving environmental conditions, which link to improved livelihood
- Better health and reduced vulnerability of the poor.

Infrastructure investment generally has two types of effects. First, it has demanded creation effect in other economic activities which is flow impact. Second, it has stock impact which makes better availability of services and improves productivity of the private sector and the economy as a whole. Therefore, infrastructure development contributes to investment and growth through increase in productivity and efficiency as it links between resources to factories, people to jobs and products to markets. But many of the benefits of infrastructure services accrue to firms – in France, for example, that input-output tables reveal that firms consume two-thirds of all infrastructure services (Prud’homme 2004). Thus it is through this channel that costs are lowered and, most importantly, market opportunities are expanded (especially through telecommunications and transport). The resulting gains in competitiveness and production are what drive the gains in economic growth and ultimately welfare.

**Figure 1 – How Infrastructure Contribute to Growth**

![Diagram of how infrastructure contribute to growth](source)

Source: (Prud’homme, 2004)

**INFRASTRUCTURE, GROWTH AND COMPETITIVENESS OF THE ECONOMY**

The positive contribution of physical infrastructure to economic growth and development comes through increases in investment, employment, output, and income in a chain of ‘cumulative causation’. Thus, ‘economies of agglomeration’
The report calls “pillars”, to measure competitiveness. The second basic pillar is infrastructure. The report emphasizes that, “Extensive and efficient infrastructure is critical for ensuring the effective functioning of the economy, as it is an important factor determining the location of economic activity and the kinds of activities or sectors that can develop in a particular economy. Well-developed infrastructure reduces the effect of distance between regions, integrating the national market and connecting it at low cost to markets in other countries and regions. In addition, the quality and extensiveness of infrastructure networks significantly impact economic growth and affect income inequalities and poverty in a variety of ways. A well-developed transport and communications infrastructure network is a prerequisite for the access of less-develop communities to core economic activities and services. Infrastructure development is one of the major factors contributing to overall economic development (I) direct investment in infrastructure creates production facilities and stimulates economic activities; (ii) reduces transaction costs and trade costs, improving competitiveness and (iii) provides employment opportunities and physical and social infrastructure to the poor. In contrast, lack of infrastructure creates bottlenecks for sustainable growth and poverty reduction.

INFRASTRUCTURE, GROWTH AND POVERTY REDUCTION: INDIAN CONTEXT

However, the importance of infrastructure goes far beyond its impact on growth. It speeds up the nation’s production and distribution of economic output as well as to its citizens’ overall quality of life. It is often said that infrastructure can be considered, if not the engine, then the wheels of economic growth. This is one part of the infrastructure story. The other part is that infrastructure helps to spread the benefits of growth, which makes the development process more inclusive. Lack of such infrastructure facilities is considered to be a major structural weakness, which holds back to underutilization of existing productive capacity and constrain, that may have unfavorable impacts on profits and production levels adversely. Weak and inadequate infrastructure leaves the country backward and allows its people to stagnate in poverty and a lower standard of living. Investigate the relationship between physical infrastructure and per capita NSDP. What is the impact of infrastructure development on poverty? Patra and Acharya (2011) examine the spatial disparities in infrastructural facilities across 16 major states in India and in turn analyses its impact on regional
economic growth. Empirical evidence suggests that there is a positive relationship between Infrastructure Development Index & Per Capita Net State Domestic Product and negative relationship between Infrastructure Development Index & Poverty. Hence, effort should be directed to create more infrastructure facilities at the state level to raise the state domestic product and reduce the level of poverty and unemployment of the people concerned.

The relationship between the availability of social and economic infrastructure and the ratio of poverty positively correlates with providing social and economic infrastructure. In which state or country providing these basic amenities or infrastructural facilities to the majority of population will benefit from these facilities, especially mass poorer sections of the society will escape from their poverty, in other words higher infrastructure facilities lower levels of poverty ratio, and low level infrastructure facilities, higher levels of poverty ratio. Infrastructure is a source of positive externalities in the development process. In fact, the absence of infrastructure is positively related to the incidence of poverty. Table 2 indicates that states which have a higher Index of Infrastructure, comprising economic, social and administrative infrastructure indicators experience lower Head Count Ratio of Poverty.

Table No. 2: Index of Social and Economic Infrastructure

<table>
<thead>
<tr>
<th>States</th>
<th>Index of Infrastructure</th>
<th>Head Count Ratio Of Poverty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Punjab</td>
<td>185.5</td>
<td>9.2</td>
</tr>
<tr>
<td>Kerala</td>
<td>178.7</td>
<td>13.3</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>149.1</td>
<td>22.9</td>
</tr>
<tr>
<td>Haryana</td>
<td>137.5</td>
<td>13.6</td>
</tr>
<tr>
<td>Gujarat</td>
<td>124.3</td>
<td>19.1</td>
</tr>
<tr>
<td>Maharashtra</td>
<td>112.8</td>
<td>29.6</td>
</tr>
<tr>
<td>West Bengal</td>
<td>111.3</td>
<td>28.6</td>
</tr>
<tr>
<td>Karnataka</td>
<td>104.9</td>
<td>20.9</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>103.3</td>
<td>11.2</td>
</tr>
<tr>
<td>Uttar Pradesh</td>
<td>101.2</td>
<td>33.4</td>
</tr>
<tr>
<td>Bihar</td>
<td>81.3</td>
<td>42.1</td>
</tr>
<tr>
<td>Orissa</td>
<td>81.0</td>
<td>46.8</td>
</tr>
<tr>
<td>Assam</td>
<td>77.7</td>
<td>22.3</td>
</tr>
<tr>
<td>Madhya Pradesh</td>
<td>76.8</td>
<td>36.9</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>75.9</td>
<td>18.7</td>
</tr>
</tbody>
</table>


The above table throws light on the fact that States with higher infrastructure status are developed states and States with low infrastructure index are backward or under developed states e.g., Rajasthan, Bihar, Orissa etc. this strongly sports the fact that there is a strong relationship between infrastructure and economic growth. In the same way States with higher Infrastructure status are having a low head count ratio of poverty. This establishes the fact that there is a strong relationship between infrastructure services availability and poverty alleviation. Higher the infrastructure services availability, lower will be the poverty levels in that country. Through the graphical presentation it will be better understanding the relationship between infrastructure index and poverty reduction.
SUMMARY AND CONCLUSION
Infrastructure services are essential to achieve development targets in any economy some of its major dimensions include the level of economic growth, level of education, level of health services, degree of modernization, status of women, level of nutrition, quality of housing, distribution of goods and services, and access to communication. But neither human well-being nor economic growth is possible only through the provision of economic infrastructure as well as social infrastructure. Health and education along with support infrastructure such as shelter, sanitation, power, telephony, and road connectivity that can give economic growth a human face. By improving the quality of human resources and enhancing capability, these indicators act as stimulants to growth. As K. C. Pant rightly said, “Infrastructure sector may not always be an engine of growth directly but they are essential rails on which the wheels of economic progress can proceed with sustained speed. Without a strong and viable infrastructure, it is difficult to achieve rapid and sustained growth of the order of 7 to 8 percent, which is necessary for progressively eradicating poverty.”

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