CHAPTER - I
INTRODUCTION

The role of infrastructure in initiating and accelerating the process of economic development has been recognised both by the economists and planners. The development plans in India and other developing countries are largely concerned with the building up of infrastructure. The availability of infrastructure services is a pre-condition to rapid economic growth in every country. In a Indian economy, efficient infrastructural support is vital for achieving high rate of growth of national income. Investment in infrastructure is being used as the major strategy for promoting the development of backward regions.

The prosperity of a country directly depends upon the development of agriculture and industry. Agricultural productivities closely associated with power, transport facilities, credit facilities etc. Industrial production requires not only machinery and equipments but also skilled man, power, management, energy, banking and transport facilities. All these facilities as a whole constitutes infrastructure of an economy. The development and expansion of these facilities are essential pre-condition for increasing agricultural and industrial production of a country. Therefore, Indian planners gave high priority for the expansion of energy, transport and communication and banking facilities to the urban as well as rural areas. Transport and
communication have a multidimensional role to play and they affect the economy in more than one way. The role of power in the process of economic development is very crucial. The use of modern technology makes heavy demand on different sources of energy, especially electricity. Irrigation and water supply systems are also important to support modern agriculture as well as industry. Economic development makes tremendous demands on educational facilities at every level and unless these are adequately developed, the process of growth may be slowed down. Lewis mentions three ways in which expenditure on health is productive: first, it increase the number of man hours of works, secondly, it improve the quality of work and thirdly, by clearing inhabitable economic development by creating a base on which a higher level of economic activity can be carried out.

Infrastructure represents the wheel of economic progress. Good infrastructure raises productivity and lower production cost. There is a precise link between infrastructure and development. A one per cent increase in the stock of infrastructure is associated with a one per cent increase in gross domestic product. The adequacy of a country's infrastructure helps to diversity production, expand trade, cope up with population growth etc. Infrastructure services also raise the productivity of factors of production such as labour and capital. This is made possible by permitting the transition from manual to electrical machinery, reducing workers commuting time and improving information flows.
Inadequate and unreliable infrastructure cripples the ability of countries to engage in international trade. Infrastructural development also contributes to domestic market development. Rural roads in the developing countries have a major effect in improving marketing opportunities and reducing transaction costs. The marketing of agricultural commodities can account for 25 to 60 per cent of final prices of food stuffs in developing countries. About half of the marketing costs are attributable to transport. Therefore, the market transparency and widespread access to market information through transport and communication channels are essential to create a competitive marketing system. Transport infrastructure has been found to expand the opportunities for non-farm employment in rural areas. Lastly, infrastructure service can be broadly divided into two categories: physical and social. The farmer consists of transport, electricity, telecommunication, irrigation, housing, water supply, sanitation etc. They directly contribute to productive activities and improvements in these inputs attract flow of additional resources.

1.1 Concept of Infrastructure:

The concept of infrastructure has been extensively used in the literature on economic development. Infrastructure has not been explicitly defined in a precise and generally acceptable manner. A number of interchangeable terms such as, 'Social Overhead', 'Economic Overheads', 'Overhead Capital', 'Basis Economic Facilities' etc. have
been used to denote services which one generally identifies with infrastructure. All these terms are taken to certain common services; each of them has its own special orientation and emphasis.

Youngson observes the title 'Overhead Capital' is vague and misleading, and conceals difficulties rather than solves problems.\(^1\) In the recent years the concept of infrastructure has been used more frequently in the literature on economic development and is often qualified by a prefix such as 'economic' or 'social' to distinguish different types of infrastructure. The concept of overhead capital, which is often used as synonymous with the concept of infrastructure, was probably used for the first time by Singer.\(^2\) H. W. Singer has identified the certain kinds of investment which are regarded necessary for development but which by themselves are not directly productive, which is in the nature of an overhead cost. Singer mentioned a good educational system, health service, housing, transport, power and irrigation as example of overhead cost.

Nurkse has used the concept of infrastructure in his book 'Problems of Capital Formation in Under Developed Countries'.\(^3\) Nurkse has used the words 'Social Overhead Capital' which according to him form an essential basis for small scale private investments in miscellaneous industries. The aims of overhead investments to providing the services - transport, power, water supply etc. These
services are basic for any productive activity. These services cannot import from abroad.

Rostow has also used the word social overhead capital. In Rostow's scheme of stages of economic growth; the economy has to have certain conditions before it is ready for take off. One of the pre-conditions for take off is the building up of social overhead capital. Hirschman has used the concept of social overhead capital in a more general sense. He has defined it as comprising those basic services without which primary, secondary and tertiary activities cannot function. The terms social overhead capital includes all public services from health to transportation, communication, power and water supply as well as agricultural overhead capital as irrigation and drainage system.

According to Rosenstein Rodan, the services of overhead capital are indirectly productive and become available only after long gestation periods. Its most important products are investment opportunities created in other industries. Social overhead capital comprises all those basic industries like power, transport or communications which must precede the more quick yielding directly productive investment. The concept of infrastructure has been viewed by V.K.R.V. Rao as an essential instrument imparting elasticity to the supply factor. He had emphasized this point particularly in the context of under-developed
countries where it is not demand constraint but the low elasticity of supply, restricted mainly by an acute dearth of infrastructure facilities.

The concept of overhead capital with social as well as economic as prefix finds it difficult to match the theoretically determined criteria with the characteristics of infrastructure. In the recent years, the concept of infrastructure commonly use as the pre-condition of economic development.

1.2 Characteristics of Infrastructure:

The conceptual framework of infrastructure has brought out the basic characteristics that infrastructural services process. Let us now examine these characteristics from the viewpoint of scientific clarity and operational applicability.

(a) Infrastructural facilities are not directly productive:

The first feature which has been generally identified with infrastructural facilities is that these facilities are not directly productive. These facilities are universally required for carrying out any kind of production yet they themselves do not productive goods for final use. They provide support to the directly productive activities and are, thus, in the nature of overhead cost.
(b) *Infrastructural facilities are the pre-condition of economic development:*

Infrastructural facilities are the pre-condition of economic development because of their universal requirement. The expansion of productive activities and market structure are unlikely to take place, beyond a level, without these services. Therefore, they have to be created in advance independent of the present extent and pattern of demand.

(c) *Infrastructure services by their very nature have a long gestation period:*

Overhead facilities like railway system, power projects, irrigation dam takes a log time. Once completed its services are utilised over a long period of time. Unlike double cropping or the application of chemical fertilizers, a railway system is unlikely to yield results in a year or two from the time its construction is undertaken.

(d) *Non-importability:*

Another main feature of social overhead capital which was enunciated first by Nurkse and later by Hirschman is that they cannot be imported from abroad. Facilities like roads or rails have to be built in areas they are intended to serve. In other case like a power house or dam where the main plant may be located at a distant place, lines and channels have to be created to take their services to the place of their use.
(e) **Lumpiness:**

Lumpiness is another characteristic attributed to social overhead capital. These facilities cannot be bits and pieces and have to be provided in a minimum size. In some cases, this may not be strictly true, for example decentralised generation of electricity is possible from micro-hydro, bio-gas, solar system, wind electricity conversion system, gasifier system. However, taken together the total cost of these decentralised systems may be quite large. In general, minimum quantum of investment, which is often large, is necessary for the creation of overheads.

(f) **External economies:**

Another distinguishing feature of infrastructure is that these facilities generate external economies that are services rendered free. The output obtainable from given inputs within an industry or region are increased or diminished by activities which are external to the management of inputs themselves. The external economies may be created by a large number of activities to a smaller or larger extent. But the distinguishing feature of infrastructure is that its installation is meant to create external economies only as they do not produce directly useable goods and services whereas external economies generated by non-infrastructure items are incidental to their production.
(g) **Provision by State:**

Social overhead facilities are unlikely to develop on an adequate scale on the basis of private enterprise and therefore, require investment by the government due to the very high investments involved in these facilities. Therefore, most of services have developed through the initiative of the state. The government participation in the provision of infrastructural facilities may take various forms and varying degrees. As Meier and Baldwin point out that the state may finance the project, but private contracting firms may undertake the actual construction, or the government could construct the project and then lease or sell it to private individuals. Still another possibility is for the state to make the funds easily available to private entrepreneur who would construct, own and operate the undertaking while the government would merely regulate the operations.⁸

To sum up the features of infrastructure facilities it may be said that these facilities are marked by the universality of requirements, necessity of their creation ahead of demand, immobility due to the simultaneity of production and use of their services, lumpiness and generation of external economies.

### 1.3 Scope of Infrastructure:

A large number of items extending from transport and power to education, law and order and social values have been included in infrastructure given by various authors.
Singer\(^9\) has included the following services and social values in infrastructure or overhead capital.

(i) Education system,

(ii) Health services,

(iii) Housing and transport,

(iv) Power and irrigation.

Nurkse identifies these activities as public utilities, transport facilities, training schemes, water works, power plants, hospitals, schools and various basic services. North has identified banking, insurance, postal facilities, warehousing, the development of distribution system for imports and the early growth of roads and turn pikes connecting the hinterland with major ports as social overhead investments which facilitated the development of manufacturing in U.S.A.\(^{10}\) Arthur Lawis has used the term infrastructure in a wider sense covering in addition to ports, electricity, motor transport, irrigation and drainage scheme, government departments concerned with 'discovering new resources, or discovering better ways of utilising known resources' such as the departments of survey, geology or soil survey as well as departments of agriculture, industry and economic research. Lawis observe that the good civil service is a crucial part of the infrastructure, since the quality of all other public services will depend upon the quality of civil services.
According to Hirschman the hard core of infrastructure can probably be restricted to transport and power. But in the broader concept of infrastructure he has included law and order, education, public health and transport, communication, power, water supply as well as such agricultural overhead capital as irrigation and drainage system.

Kindelberger\textsuperscript{11} while making a distinction between economic and social overhead capital, identifies transport including ports, roads, railroads, electricity and gas production capacity, pipe-lines, transmission lines, communication network and also building needed for government, fire and police protection facilities to maintain roads etc. as economic overhead capital and plant and equipment required for shelter, education and public health as social overheads capital.

Shah\textsuperscript{12} has made a broad categorization of infrastructure under eight heads viz. power, irrigation, transport, communication, education, research and development, health and other facilities.

Indian economist professor V.K.R.V. Rao has made a very exhaustive categorisation of factor of production that constitute infrastructure. He has divided them into following nine broad categories and has included 42 activities in it.

(i) Transport : Roads, railways, shipping ports and harbours, airports, transport equipments.

| (iii) Energy | Coal, Electricity (hydro, thermal, nuclear), wind power, solar power, oil, gas, biogas. |
| (iv) Intermediate goods output | Minerals, steel, metals other than steel, basic chemicals, fertilizers and pesticides, machinery and machine tools. |
| (v) Increasing Productivity of Natural resources | Reclamation of land, irrigation, drainage, contour bunding and land reshaping, consolidation of holding, high yielding bovine varieties, fishing boats, fishing equipments and refrigeration, afforest-ration and development of commercial forests. |
| (vi) Science and Technology | Teaching, basic and applied research, national laboratories, liaison with production units. |
| (vii) Information System | Mass media, libraries and museums, fairs and exhibitions, books and journals |
| (viii) Finance and Banking | Saving institutions, credit and leading institutions, capital market. |
| (ix) Human Resource Development | Health, drinking water, disease eradication, public hygiene, family planning, medical facilities, educational facilities. |
The scopes of infrastructure determine is very difficult. It is very difficult to suggest a foolproof list of infrastructure as the items included under infrastructure are characterised by a number of features which are not found in each items in an equal measures. Many authors have distinguished between the narrow and broader concept of infrastructure. In the context of developing countries, a broader concept of infrastructure is more helpful to guide the development planners.

1.4 Types of Infrastructure:

Most of the development economists have divided infrastructural facilities into two broad categories, viz. Economic infrastructure and Social infrastructure. Another classification has been made by Rosenstein Rodan on the basis of different stages of development, i.e. developmental and rehabilitative. The distinguished between different items of infrastructure on the basis of specific sectors or areas which they primarily serve such as industry and agriculture or urban and rural. Brief discussions of these classifications will clearly being out the rational of division as well as the distinction between different types of infrastructure.

(A) Economic and Social Infrastructure:

This is the most commonly used classification of infrastructure. In the economic infrastructure, all those facilities are included which are directly required for economic activities such as power, transport,
communication, banking and marketing facilities etc. The term 'social infrastructure' is used those overhead facilities which tend to improve the quality of human agent involved in the process of production. This term includes facilities like education, health, housing, drinking water etc. Economic and social categories are equally important for carrying on of general economic activities.

(B) Developmental and Rehabilitative Infrastructure:

This distinction has been made by Rosenstein Rodam. According to him, development overhead capital provides for a hoped for but uncertain future demand and the rehabilitative social overhead capital caters to an unsatisfied demand of the past. This classification does not help in grouping into different categories various items of infrastructure as it would be the level of the development of the economy. This classification is useful for understanding the changing role of infrastructure with the changes in the level of development of an economy.

(C) Rural and Urban Infrastructure:

The overhead facilities serve the need of the economy in general and facility may be used by different sectors. This type of classification of the infrastructure is very useful to distinguish between facilities which primarily cater to specific sectors of the economy. To illustrate, irrigation facilities primarily serve the agricultural sector. The training
facility required by industry and agriculture would be of different types. Similarly, while credit and marketing facilities are commonly needs by both the sector. In our country, these services are being provided by cooperative societies in the rural areas but private or public institutions are providing these services in the urban areas.

(D) Institutional and Non-Institutional Infrastructure

The recent tendency has been towards an enlargement of concept of infrastructure including various items like law and order, administrative and extension agencies, financial organisation etc. In this context, this type is useful for distinction between institutional and non-institutional infrastructure. The governments of the developing countries have been taking increasingly the responsibility of creating a number of organisation to promote the pace development ranging from financial institutions and extension agencies to marketing and general administration. The concept of institutional infrastructure would cover the developmental institutions providing different kinds of services.

In the light of the above discussion, the present studies propose to classify the items of infrastructure into the following two categories:

1) Economic Infrastructure:
   i) Energy (Electrical power),
   ii) Transport and Communication,
   iii) Finance and Banking,
   iv) Irrigation,
   v) Marketing.
2) **Social Infrastructure:**

i) Education,

ii) Health,

iii) Drinking water supply.

Above sub-items of both economic and social infrastructure are necessary for rapidly economic growth of any country. Economic facilities normally take the form of physical capital formation. These are sometimes called the hard core of infrastructure and are basic for general economic activity. The social infrastructure broadly covers facilities which lead to human capital formation. In the present study, the classifications of infrastructure based on economic and social category have been selected.

**1.5 Role of Infrastructure in Economic Development:**

The role of infrastructure in the process of economic development is very important. The availability of infrastructural facilities is necessary pre-condition economic development. Economic development is associated with a number of structural changes of a fundamental nature in various aspects of the economy and the society. Relationship of infrastructure and economic development may be analysed by focussing on its impact on the basic determinants of development. In other words, the close link of factors determining the supply of capital with various items of infrastructure is quite obvious specially so in case of financial institutions. The functions of
infrastructure are to release latent productivity in the factors of production. One of the most significant contributions that infrastructure make to economic development is through its impact on the availability and supply elasticity of factors of production and on the size of the market. In this context the role of transport and communication facilities has been emphasised by development economists. Transport and communication infrastructure have a multi-dimensional role to play and they affect the economy in more than one way. The extension and improvement of transport facilities generally result in the reduction of per unit transport cost. Further, a developed transport and communication network improves economic efficiency by increasing the mobility of supply of labour and other factors of production.

The role power in the process of economic development is very crucial. The use of modern technology makes heavy demand on different sources of energy, especially electricity. Therefore power is regarded as the core of infrastructure and is justly given very high priority in the development plans.

Irrigation and water supply system are also important to support modern agriculture as well as industry. Economic development of any country depends upon the improvement and increasing facilities of agriculture and industrial infrastructure. The modern industry uses water in enormous quantities for processing, filtering, flushing and cooling. Furthermore, large supplies of water may be necessary for urbanization.
There is no denying the fact that education is enormously important for economic development. Education is besides bringing about number of changes in attitude to work, family size, traditions etc. Economic development makes tremendous demand on educational facilities at every level and unless these are adequately developed, the process of growth may be slowed down. Modern industry requires trained personal who can handle complicated modern technology. The shortage of skilled man power serves as a serious impediment to growth. The use of physical capital will be limited if technical, professional and administrative skill are not available in sufficient number.

The supply of water through irrigation brings about an increase in the productivity of land and an increase in agricultural production. But the operation of irrigated agriculture requires a number of other inputs such as electric power, variety of seeds, fertilizer and pesticides, provision of storage, marketing and transport facilities etc.

To sum up the discussions so far, the study have emphasized the role of infrastructure in promoting economic development by creating a base on which a higher level of economic activity can be carried out. Infrastructure works directly and indirectly on a number of determinants of economic development. The process of development of infrastructure itself directly contributes to the growth of the economy. The relationship between infrastructure and economic development is now well accepted so much so that it is regarded by most of the development economists as
a necessary precondition and the strategy of development based on prior development of infrastructure has been advocated generally. Lastly, it can be concluded both on ground of logic and history of economic development that a minimum level of development of infrastructure is pre-condition of economic development to make it a smooth and continuous process.

1.6 Infrastructure Development in India under Planning period:

1.6.1 Background:

The development of infrastructure in India in the form of railways, road transport, canals, electric supply, modern banking, education etc. can be traced back to the British period. The expansion of British rule in India and the need of the supply of raw materials needed for the British industries motivated the investment in the development of infrastructure facilities. The large network of roads and rail transport was started from the British period. The first major rural electrification project in India, know as the Ganges Hydro Electric Scheme was started in Uttar Pradesh from 1925 to 1927. But the development power remained highly inadequate during the British regime. The British also introduced the modern system of education to create a socio-cultural base for training and recruitment laid down by Lord Macaulay. Through the foundation of modern infrastructure were laid during the British period, the development of these facilities remained highly inadequate.
1.6.2 *Growth of Infrastructure since Independence:*

Indian planners were fully aware of the link between infrastructural facilities and general economic development and accordingly they have given high priority to the expansion of these facilities right from the first five year plan. The situation with regard to the development of social and economic overhead facilities on the eve of planning has been shown in table 1.1.

**Table 1.1: Selected Indicators of Infrastructure Development in India Around 1950**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Indicators</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Net irrigated area as per cent of net shown area ............</td>
<td>17.3</td>
</tr>
<tr>
<td>2</td>
<td>Installed power capacity (mw) ..................................</td>
<td>1835</td>
</tr>
<tr>
<td>3</td>
<td>Percentage of villages electrified to total villages ..........</td>
<td>0.5</td>
</tr>
<tr>
<td>4</td>
<td>Total Rail root length (km.) ..................................</td>
<td>53596</td>
</tr>
<tr>
<td>5</td>
<td>Commercial Bank offices (1956) ................................</td>
<td>4067</td>
</tr>
<tr>
<td>6</td>
<td>Number of beds per lakh of population .........................</td>
<td>31</td>
</tr>
<tr>
<td>7</td>
<td>Literacy rate ................................................................</td>
<td>18.3</td>
</tr>
</tbody>
</table>

**Source:** Complied from Statistical Abstract of India and First Five Year Plan

The table 1.1 highlights the extreme inadequacy of these facilities at the time of independence. Table shows that irrigation facilities were
available only 17.3 per cent of net shown area. Only 0.5 per cent villages had electricity. The educational and health facilities were at a very low level. This low level of infrastructure facilities was acting as major constraint on the economic development of India. Therefore, the Indian planners gave high priority of infrastructure development from the very beginning of planning.

1.6.3 Growth of Infrastructure under Plans:

After independence, the government of India concentrated in development of infrastructure. There are bright signs of development in roads, transport, communication, education, banking and insurance, water supply, power sector etc. But the development of the infrastructure sector is too far from satisfaction. After 1991, the Government has given top most priority to this sector. Many fiscal incentives were declared in various budgets from 1992 to 2008. The budgets also gave a renewed threat to sectors such as power, roads, ports and telecom. Table 1.2 shows the development of infrastructure in India from 1950-51 to 2000-01.

Table 1.2 shows that the development of power sector, irrigation, banking, road and transport, literacy, health and drinking water facilities during the planning period (1950-51 to 2000-01).
Table 1.2: Development of Infrastructure under Planning Period

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<tbody>
<tr>
<td>1</td>
<td>Installed Power Capacity (mw)</td>
<td>1835</td>
<td>4653</td>
<td>14709</td>
<td>30214</td>
<td>66100</td>
<td>101600</td>
<td>107900</td>
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<tr>
<td>2</td>
<td>Power Generation (kwh)</td>
<td>5858</td>
<td>16937</td>
<td>55827</td>
<td>110884</td>
<td>246941</td>
<td>470777</td>
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</tr>
<tr>
<td>3</td>
<td>Percentages of villages electrified to total</td>
<td>0.5</td>
<td>3.8</td>
<td>18.5</td>
<td>47.3</td>
<td>84.1</td>
<td>84.9</td>
<td>84.7</td>
</tr>
<tr>
<td>4</td>
<td>Per Capita Consumption of Power (kwh)</td>
<td>18.00</td>
<td>38.00</td>
<td>90.00</td>
<td>135</td>
<td>252.77</td>
<td>374.00</td>
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<tr>
<td>5</td>
<td>Net Shown Area (million hector)</td>
<td>118.75</td>
<td>133.20</td>
<td>140.27</td>
<td>140.30</td>
<td>--</td>
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</tr>
<tr>
<td>6</td>
<td>Net Irrigated Area (million hectar)</td>
<td>20.85</td>
<td>24.66</td>
<td>31.10</td>
<td>38.84</td>
<td>--</td>
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<tr>
<td>7</td>
<td>Net Irrigated Area as percentage of net shown area</td>
<td>17.55</td>
<td>18.51</td>
<td>22.17</td>
<td>27.68</td>
<td>30.7</td>
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<tr>
<td>8</td>
<td>Road length (lakh km.)</td>
<td>4</td>
<td>5.24</td>
<td>9.17</td>
<td>14.91</td>
<td>19.98</td>
<td>33.00</td>
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</tr>
<tr>
<td>9</td>
<td>Railway Route length (km)</td>
<td>53596</td>
<td>56247</td>
<td>59790</td>
<td>61240</td>
<td>62400</td>
<td>63000</td>
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<td>No. of telephone connection (lakh)</td>
<td>1.68</td>
<td>4.63</td>
<td>12.93</td>
<td>27.85</td>
<td>148.8</td>
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<td>No. of Commercial Banks</td>
<td>423</td>
<td>85</td>
<td>137</td>
<td>157</td>
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<td>12</td>
<td>Per Capita Deposit (Rs.)</td>
<td>29</td>
<td>88</td>
<td>625</td>
<td>738</td>
<td>4242</td>
<td>8542</td>
<td>12253</td>
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<tr>
<td>13</td>
<td>Literacy rate (%)</td>
<td>18.3</td>
<td>28.3</td>
<td>34.4</td>
<td>43.6</td>
<td>52.2</td>
<td>64.8</td>
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<td>485358</td>
<td>--</td>
<td>664041</td>
<td>772568</td>
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<td>(2001-02)</td>
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<tr>
<td>15</td>
<td>No. of middle / Senior basis schools</td>
<td>13569</td>
<td>49663</td>
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<td>116447</td>
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<td>219626</td>
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<tr>
<td>16</td>
<td>No. of higher secondary / Junior colleges</td>
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<td>17257</td>
<td>--</td>
<td>47755</td>
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<td>133492</td>
<td>159667</td>
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<tr>
<td>17</td>
<td>No. of Hospitals</td>
<td>2717</td>
<td>4011</td>
<td>4239</td>
<td>6670</td>
<td>--</td>
<td>--</td>
<td>33855</td>
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<td>(2008)</td>
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</tr>
<tr>
<td>18</td>
<td>No. of beds per lakh of population</td>
<td>31</td>
<td>46</td>
<td>60</td>
<td>74</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>19</td>
<td>Crude Birth Rate (per 1000 population)</td>
<td>40.8</td>
<td>--</td>
<td>--</td>
<td>33.9</td>
<td>29.5</td>
<td>25.4</td>
<td>23.1</td>
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<td></td>
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<td>20</td>
<td>Crude Death Rate (per 1000 population)</td>
<td>25.1</td>
<td>--</td>
<td>--</td>
<td>12.5</td>
<td>9.8</td>
<td>8.5</td>
<td>7.4</td>
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<tr>
<td></td>
<td>(2002)</td>
<td></td>
<td></td>
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<tr>
<td>21</td>
<td>Infant Mortality Rate (per 1000 live birth)</td>
<td>146</td>
<td>115</td>
<td>77</td>
<td>110</td>
<td>80</td>
<td>64</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>(2002)</td>
<td></td>
<td></td>
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<tr>
<td>22</td>
<td>Access to safe drinking water in households (%)</td>
<td>--</td>
<td>38.2</td>
<td>--</td>
<td>38.2</td>
<td>62.3</td>
<td>77.9</td>
<td>--</td>
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</tbody>
</table>

Source: Five Year Plans and Various Economic Survey of India.
A high priority was given by the Indian planners to the increase of power facilities. In 2000-01 the installed power capacity which was a pitiable 1835 mw. Similarly the generation has increased from 5838 kwh in 1950-51 to 470777 kwh in 2000-01. The change in the power situation is sharply reflected in the growth of power consumption per capita from 18 kwh in 1950-51 to 135 kwh in 1980-81 and further to 374 kwh in 2000-01. Equally impressive has been the progress of the rural electrification programme. In 1950-51 electricity had reached only 407 villages, i.e. only 0.5 per cent of the Indian villages. Today the percentage of electrified villages to total Indian village is 84.7.

The heavy emphasis has resulted in the development of irrigation facilities during the last fifty-five years. Table 1.2 also shows the growth of irrigated area. Table clearly shows that the net irrigated area has increased from 20.85 million hectares in 1950-51 to 38.84 million hectares in 1980-81. Table also shows that the percentage of net irrigated area to net shown area has increased 17.55 in 1950-51 to 30.7 in the year 1990-91.

A good network of railways was already in existence before independence. The emphasis in the post independence period has been more on modernisation and replacement rather than on expansion of the route length. The railway route length has increased from 53596 km in 1950-51 to 63000 km in 2000-01. This has increased by 9404 km or by 17.5 percent. Similarly the road length has increased from 4 lakh km in
1950-51 to 14.91 lakh km in 1980-81 and further to 33 lakh km in 2000-01. There has been extensive development of telecommunication facilities during the planning period. The number of telephone connections has increased from 1.68 lakh in 1950-51 to 928.92 lakh in Dec. 2004.

The development of banking facility has been spectacular especially after the nationalisation of commercial bank in 1969. Table 1.2 gives select two indicators (no. of commercial banks and per capita deposit) of banking development during the last five decades. The number of commercial bank was 423 in the year 1956. These commercial banks are 292 in the year 2003. Per capita deposit has jumped from Rs. 29 in 1956 to Rs. 12253 in 2003. To serve the rural area, Regional Rural Banks have been set up during the planning period.

There has been a tremendous quantitative expansion in the field of education since independence which is reflected in the impressive growth of educational institutions as shown in table 1.2. Literacy rate have also gone up from 18.3 per cent in 1950-51 to 64.8 per cent in 2001. Number of primary schools has increased from 209671 in 1950-51 to 772568 in the year 2005-06.

In the field of health facilities also there has been a very substantial expansion of facilities. Table 1.2 also shows the expansion of health services since 1950. During the last fifty-eight years, the number of hospitals increased form 2717 in 1950-51 to 6670 in the year 1980-81
and further to 33855 in the year 2008. The development of health facilities has led to the decline in the death rate for thousands population from 25.1 in 1950-51 to 7.4 in the year 2007. Likewise the infant mortality for thousand live births has gone down from 146 in 1951-61 to 55 in 2007. The safe drinking water facilities in households have increased from 38.2 per cent in 1960-61 to 77.9 per cent in 2000-01.

The brief review of progress in various fields reveals an impressive quantitative expansion of various types of infrastructure facilities. However, in terms of the requirements, the level of development of infrastructure is still far from adequate and there are significant deficiencies and lags which need to be removed as early as possible to ensure a smooth and rapid process of economic development.

1.7 Inadequate Infrastructure:

The Indian economy is suffering from inadequate infrastructure. Power shortages are common in all part of this country. Transportation facilities are poor and inadequate. Communication facilities are poor and they are being developed due to the participation of private companies. Bank and Finance facilities in rural areas are not progressing due to several reasons. There no encouraging signals from Science and Technology and other sub-sectors. According to the World Bank Country Study 1997, the Indian states are caught amidst three major crises. viz., fiscal crisis, infrastructure crisis and human resource development crisis. This study made it obvious that by the second half
of the 1980s, it became evident that the states were experiencing considerable fiscal difficulties. Social capital, education, health operations and maintenance expenditure started declining from the mid-1980s and interest expenditure tended to increase. Resources for operation and maintenance become insufficient and infrastructure began to exhibit signs of decay.

1.8 Problems of Infrastructure Development:

Infrastructure is the base of development of modern economy and society. The government has not succeeded in achieving higher growth of transportation, power, gas and water supply came down. The Indian private sector and foreign sector do not give proper and sound response towards Government encouragements and incentives. There are many problems in the development of infrastructural sector. Some of the main problems can be narrated as under:-

A) Huge financial requirement:

Huge and giant financial requirement is a major problem. Rakesh Mohan Committee too recognized the problem of the huge financial requirement. Neither the Government not the private sector can fulfil this huge financial requirement.
B) Less profitability:

Less profitability is another obstacle in the development of infrastructure. It is rather less profit motive sector. Private and Multinational enterprises are less interested in this sector because they want profit maximisation.

C) Poor management and resource allocation:

Resource allocation and management in this sector are very poor. Problem of infrastructural development are not only quantitative but also qualitative. Mismanagement in this sector is responsible for these problems.

D) Long gestation period:

Infrastructure sector involves long gestation period. Previously, whenever the Government made any investment, they did not consider the Return on Investment as well as gestation period. The Projects are evaluated on the basis of social cost benefit analysis rather than on the basis of quick return. But the private companies want to get the return at the earliest.

E) Heavy operating losses:

Majority of the projects are incurring heavy operating losses. This is mainly because of overheads. Establishment overheads alone constitute fifty to fifty-five per cent of their revenue. This problem creates only because of excess manpower.
F) Traditional framework:

The traditional framework for the delivery of infrastructure has shown serious weakness in the planning and implementation of projects. Non-availability of funds on the timely basis and lack of proper evaluation and implementation of projects have led to major time and cost overruns.

Problems of infrastructure development are more serious. There is need to change the strategy, direction and nature of economic development. Infrastructure services are often monopolistic in nature. In the past, infrastructure services have been predominantly provided by the public sector and the responsibility for providing these services was vested with the Government. But in the globalisation period, infrastructure services are provided by the private sector as well as public private co-ordination.

1.9 Development of Infrastructure in Maharashtra:

Maharashtra is a developed state of India. The state is a major contributor to the nation's economy accounting for almost 21 per cent of the industrial output, 13 per cent of the national Gross Domestic Product, 13.7 per cent of the factory employment. Maharashtra is rated as one of the most preferred investment destination in the country. The state plan, being an integral part of national plan, reflects national objectives and priorities besides socio-economic needs of the states. Like the Central plans, the state also gave a higher priority to the
Human Development Index (HDI) is the measure of life expectancy, literacy, education, standards of living and GDP per capita of a region. As per the Human Development Index Report 2001 by Planning Commission, Maharashtra scores of 0.52 as on 2001, improving its score of 0.36 of 1981. Maharashtra has improved consistently over the year in the three basic indicators of infrastructure i.e. health, education and income, the relative ranking of Maharashtra has gone one place down over the past two decades. The selected indicators of infrastructure development in Maharashtra from 1960-61 to 2004-05 has been shown in table 1.3.

Table 1.3 shows the development of infrastructure in Maharashtra from 1960-61 to 2004-05. As regards inter se priority among the different items of infrastructure, power was given highest importance followed by irrigation and transport in that order. Table shows the development of power in the state during the planning period. The table clearly shows that the installed capacity of power increased from 759 thousand kw in 1960-61 to 17984 thousand kw in 2004-05. Power generation has increased from 3268 million kwh in 1960-61 to 95297 million kwh in 2006-07. Similarly the towns and villages electrified increased from 853 to 36011 during the planning period. Maharashtra once used to be a model state for its notable efficiency in power sector.
### Table 1.3: Selected Indicators of Infrastructure in Maharashtra

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Installed Capacity of Power (000kw)</td>
<td>759</td>
<td>2119</td>
<td>4298</td>
<td>8876</td>
<td>12963</td>
<td>17984 (2006-07)</td>
</tr>
<tr>
<td>2</td>
<td>Electricity generation (million kwh)</td>
<td>3268</td>
<td>9134</td>
<td>18751</td>
<td>37311</td>
<td>64740</td>
<td>95297 (2006-07)</td>
</tr>
<tr>
<td>3</td>
<td>Electricity consumption (million kwh)</td>
<td>2720</td>
<td>7650</td>
<td>14034</td>
<td>29971</td>
<td>62085 (2000-01)</td>
<td>--</td>
</tr>
<tr>
<td>4</td>
<td>Towns and villages electrified</td>
<td>853</td>
<td>20112</td>
<td>27914</td>
<td>39413</td>
<td>40687</td>
<td>36011</td>
</tr>
<tr>
<td>5</td>
<td>Gross Area Irrigated (000 hectares)</td>
<td>1220</td>
<td>1570</td>
<td>2415</td>
<td>3319</td>
<td>3668</td>
<td>3665</td>
</tr>
<tr>
<td>6</td>
<td>Net Area Shown</td>
<td>17878</td>
<td>17768</td>
<td>18299</td>
<td>18565</td>
<td>17579</td>
<td>17490</td>
</tr>
<tr>
<td>7</td>
<td>Gross Cropped area (000 hectares)</td>
<td>18823</td>
<td>18737</td>
<td>19642</td>
<td>21859</td>
<td>22368</td>
<td>22368</td>
</tr>
<tr>
<td>8</td>
<td>Number of co-op. societies</td>
<td>31565</td>
<td>42603</td>
<td>60747</td>
<td>104620</td>
<td>173402</td>
<td>184390</td>
</tr>
<tr>
<td>9</td>
<td>Number of members in co-op. societies (in thousand)</td>
<td>4191</td>
<td>8581</td>
<td>14783</td>
<td>26903</td>
<td>47588</td>
<td>45822</td>
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</tr>
<tr>
<td>10</td>
<td>Length of Roads (km)</td>
<td>37757</td>
<td>62703</td>
<td>138613</td>
<td>172859</td>
<td>224940</td>
<td>229302</td>
</tr>
<tr>
<td>11</td>
<td>Number of vehicles</td>
<td>89127</td>
<td>257539</td>
<td>725352</td>
<td>2430615</td>
<td>7929040</td>
<td>9656303</td>
</tr>
<tr>
<td>12</td>
<td>Number of primary education Institutions</td>
<td>2468</td>
<td>5339</td>
<td>6119</td>
<td>9992</td>
<td>67062</td>
<td>67964</td>
</tr>
<tr>
<td>13</td>
<td>Number of students (in thousand)</td>
<td>858</td>
<td>1936</td>
<td>3309</td>
<td>5794</td>
<td>11837</td>
<td>11747</td>
</tr>
<tr>
<td>14</td>
<td>Number of teacher (in thousand)</td>
<td>35</td>
<td>77</td>
<td>114</td>
<td>182</td>
<td>315</td>
<td>330</td>
</tr>
<tr>
<td>15</td>
<td>Hospitals</td>
<td>--</td>
<td>299</td>
<td>530</td>
<td>768</td>
<td>1054 (2006-07)</td>
<td>--</td>
</tr>
<tr>
<td>16</td>
<td>Beds per lakh of population</td>
<td>--</td>
<td>88</td>
<td>114</td>
<td>144</td>
<td>90 (2006)</td>
<td>--</td>
</tr>
<tr>
<td>17</td>
<td>Birth Rate</td>
<td>34.7</td>
<td>32.2</td>
<td>28.5</td>
<td>26.2</td>
<td>18.5 (2006-07)</td>
<td>--</td>
</tr>
<tr>
<td>18</td>
<td>Infant Mortality Rate</td>
<td>86</td>
<td>105</td>
<td>79</td>
<td>60</td>
<td>35 (2006-07)</td>
<td>--</td>
</tr>
</tbody>
</table>

**Source:** Economic Survey of Maharashtra 2007-08.
However, presently Maharashtra loads the states in power shortage and has the highest demand supply gap. The peak shortage has risen from 2500 mw in 2005 to 6800 mw in April 2007. Due to this, there have been instances of power curtail to rural areas for more than 16 hours in a day.

The development of irrigation infrastructure is the basic indicator of agricultural development. In Maharashtra gross area irrigated has increased from 1220 thousand hectors in 1960-61 to 3665 thousand hectors in the year 2004-05. Maharashtra transport network has expanded manifold since independence, both in terms of spread and capacity. The road infrastructure in the state is managed by various local bodies including public worker Department (PWD), MSRDC, MIDC and forest department. Total road length has increased from 35757 km in 1960-61 to 229302 km in 2004-05. The state also has 4176 km of national highways.

In comparison with other state on health and education parameters, Maharashtra is one of the better performers. The state had 1054 government and public aided hospitals; 90 beds per lakh of population and 1809 primary health care centres as of 2005-06. Infant mortality rate has decreased from 86 in 1960-61 to 35 in the year 2006-07. The development of educational facilities at all levels has been presented in table 1.3. Table reveals that there has been good deal of expansion of educational institutions at all levels. The number of
primary schools in the state has risen from 2468 in 1960-61 to 67964 in 2004-05 and has a ratio of 34 students per teacher.

This above information of infrastructure facilities in Maharashtra shows that there has been an extensive development of infrastructure facilities over the plan period. But the efforts are required for bringing about qualitative improvement in the infrastructure facilities apart from their quantitative expansion.

1.10 Inter-State Disparities in Infrastructure:

Regional inequality of the infrastructure development both at the inter-state and intra-state level have characterised economic development in India. The variations in the level of development in various states and regions of the country are accompanied by equally sharp variations in infrastructure facilities. The problems of regional disparities had been causing great concern to the planners and political leaders since the beginning of the planning period. However, it was in the Third Five Year Plan that a more concerted effort was made and a new chapter on balanced regional development was added in the plan document. The third plan stressed the need of studies of trends and rates of growth of difference regions on a continuous basis.

Planning Commission has appointed a working group in 1968 to go into the question of identification of backward areas. Popularly known as Pande Committee, it suggested six criteria for the identification of backward states, viz. per capita income, per capita
annual consumption of electricity, length of surfaced roads etc. Around the same time, the Ministry of Industrial Development also set up a committee under the chairmanship of Shri N.N. Wanchoo to get into the question of financial insensitive for industries in the backward areas. Thereafter, National Committee on the Development of Backward Region (1978), Ashok Mitra study group, Narottam Shah, V. Nath, M.N. Pal, Hemlata Rao, B.N. Ganguli and D.B. Gupta etc. have studied to identify the inter-regional disparities in the development.

The problem of regional inequality in the economic development of Maharashtra has been widely and consistently discussed on various platforms for a number of years. For the first time Dandekar Committee Report has examined this issue in 1984. Since then number of committees and researchers have examined this issue from time to time. In 1995, the Government of Maharashtra appointed the 'Indicators and Backlog Committee' to study the impact of the expenditure incurred by the Government from 1984 to 1994, on the three regions of the state (Marathwada, Vidarbha and Rest of Maharashtra). This committee concluded regional imbalances in the infrastructure development between three regions of the state had increased four fold. The Government of India appointed a committee under the Chairmanship of Mr. E.A.S. Sharma to identify '100 Poorest Districts' in the country. It is surprising to note that, this committee identified ten poorest districts in a highly developed state of Maharashtra. It is clear from the forgoing
analysis, inter-state and inter-regional disparities of the infrastructure development are the serious problem of balance infrastructural development.

1.11 Jalna District and Infrastructure development:

The pattern of economic development in Maharashtra has not been uniform throughout the state and there are marked disparities in the level of infrastructure development both at the regional and the district level. All the districts in Marathwada region of Maharashtra state have less developed in the case of infrastructural facilities. Jalna is one district of Marathwada region and has less developed district in infrastructural facilities. The district was formed on 1st May 1981. It includes Jalna, Ambad, Bhokardan, Jafrabad, Partur, Ghansawangi, Badnapur and Mantha talukas. The geographical area of the district is 7718 sq. km. It is 2.15 per cent of Maharashtra's area. According to the 2001 census report, there are 963 villages, 785 grampanchayats and 16.12 lakh population.

Infrastructure development of Jalna district is inadequate and unsatisfactory. The development of economic infrastructure viz. roads and transports, irrigation, electric power, banking facilities, marketing facilities is inadequate as compared to state facilities. Per capita use of electricity consumption in Jalna district is only 34.4 kwh, which is very low as compared to Maharashtra state (125.30 kwh). Total length of roads for per lakh of population in the district is 267 km. The use of
motor vehicles for per lakh population in the district is 7107. In the case of health facilities, there are 12 government and public aided hospitals, 12 dispensaries and 39 primary health centres in the year 2007-08. The percentage of literacy in the Jalna district is 64.40 per cent as per census report 2001. State literacy rate is 77.27 for the same period. It means the percentage of literacy in the Jalna district is very low as compared to that at state level.

In the case of irrigation infrastructure, percentage of net irrigated area to net cropped area is only 12.74 in the year 2006-07, which is very less as compared to state and national average. There are 170 bank branches in Jalna district for the year 2007-08. These branches are spread over the 4 cities and 51 villages in the district. There is one district central co-operative bank in Jalna district with 65 branches giving short term and long term loans to agricultural sector. Electricity consumption, road-transport and communication, irrigation, banking and marketing facilities, education, health, drinking water etc. basic infrastructural facilities in Jalna district are not sufficient as compared to state and national level. Lastly, it is clear that, Jalna district is backward district of Maharashtra State.

No attempt has so far been made to study of infrastructure development in Jalna district. Infrastructural facilities are the pre-condition of the development of Jalna district. Therefore, the present
study is undertaken to study of infrastructure development in Jalna district.

1.12 Objectives of the Present Study:

The following are the main objectives of the present study:

1. To analyse the economic infrastructural development in Jalna district.
2. To analyse the social infrastructural development in the Jalna district.
3. To study the impact of infrastructural development on the economy of Jalna district.
4. To compare the level of infrastructural development in Jalna district with the Maharashtra State level.

1.13 Research Methodology:

The adoption of sound methodology in any research work is the vital role to achieve the objectives of the study. It deals with data requirement, sources of data, collection of data, scope of the study, the explanation of concepts and tools of analysis used.

1. The data requirements:

Data on different economic and social aspects such as power (electricity) facilities, road transport and communications, irrigations, banking and marketing facilities, education, health and drinking water facilities are required in order to provide the basic infrastructure
development in Jalna district. Jalna district is the most backward district in Maharashtra State. Therefore, block-wise analysis of the infrastructural facilities was taken into consideration in the present study. The data on basic infrastructural facilities of Maharashtra State are required to compare the district level position of these facilities in Jalna district.

2. **Source of the Data:**

The secondary source of data for the present study was collected from the socio-economic survey of Maharashtra, District Statistical Abstract of Jalna district (1996-97 to 2006-07), selected indicators for districts in Maharashtra and states in India, Committee reports on regional imbalances and other relevant sources. The data on basic economic and social infrastructure such as irrigation, education, health etc. were obtained from respective departments of the Jalna district and from Jalna district Census Report 1991 and 2001.

3. **Scope of the Study:**

The present study pertains to the development of infrastructural facilities in the Jalna district. Therefore, the study was selected Jalna district of Maharashtra State. Basic five economic infrastructural facilities and three social infrastructural facilities were selected for the analysis of this research work. The present study covers the period of ten years form 1996-97 to 2005-06.
4. **Basic indicators for infrastructure:**

The following basic five economic and three social indicators were selected to the present study.

i) **Power (Electricity):**

   a) Percentage of towns and villages electrified to the total number of towns and villages;
   b) Per capita domestic consumption of electricity (kwh);
   c) Per capita industrial consumption of electricity (kwh);
   d) Agricultural use of electricity;
   e) Number of electric connections.

ii) **Irrigation:**

   a) Percentage of gross irrigated area to gross cropped area;
   b) Percentage of actual irrigated area to irrigation potential created;
   c) Sources of irrigation;
   d) Net irrigated area.

iii) **Roads transports and communications:**

   a) Road length per lakh population;
   b) Railway route length per lakh population;
   c) The length of rural roads and district roads;
   d) Motor vehicles per lakh of population;
   e) Number of posts and telegraph offices;
   f) Number of telephone per lakh of population.
iv) Banking:

a) Number of commercial banks per lakh of population;

b) Per capita deposits.

v) Marketing:

a) Number of member per co-operative marketing institutions;

b) Agricultural and non-agricultural credit institutions;

c) Borrowing per agricultural credit society.

Above five economic infrastructural facilities in the Jalna district were selected for the present study.

vi) Education:

a) Number of institutions (primary, secondary and higher secondary education);

b) Student enrolment of primary and secondary schools;

c) Number of students per teacher in the school;

d) Number of primary and secondary school per lakh of population;

e) Literacy rate.

vii) Health:

a) Number of hospitals and dispensaries;

b) Number of primary health care centres;

c) Number of beds in public and public aided medical institutions per lakh of population;
d) Birth rate, death rate and infant mortality rate;

e) Number of registered death by all diseases per lakh of population.

**viii) Drinking water:**

a) Number of villages to available sufficient drinking water;

b) Assess to safe drinking water in household.

These three social infrastructural facilities have selected for the analysis.

5. **Tools of analysis:**

In the present study, some statistical tools have been used for the analysis of infrastructure in Jalna district. Tabular analysis was used to the study.

6. **Scheme of Chapters:**

The present thesis is divided into six chapters.

The first chapter deals with introduction, importance, scope and types of infrastructure. Role of infrastructure in economic development and infrastructure development in India and Maharashtra also have been analysed in this chapter. It also gives the objectives of the present study, research methodology and scheme of chapter.

The second chapter is devoted to review the relevant and recent literature on infrastructure development.
The third chapter deals with the economic profile of Jalna district.

The fourth chapter presents the analysis of economic infrastructural development in Jalna district. Power (electricity), roads, transports and communications, irrigation, banking facilities and marketing facilities are analysed in this chapter.

The social infrastructural development of Jalna district have discussed in fifth chapter. Education, health and drinking water facilities have analysed in this chapter.

The sixth and final chapter summarises the findings of the present study and suggests suitable policy measures based on the findings to improve the infrastructural development of Jalna district.

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