CHAPTER I

INTRODUCTION
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The importance of developing infrastructure has long been recognised as vital in promoting economic growth. In rural areas, it has wide ranging impact on individuals, households and communities both in terms of income and other qualities of life indicators. There are both direct and indirect benefits from infrastructure development and it is important to consider the indirect benefits in decision-making about projects on infrastructure. There are also strong social benefits from infrastructure that need to be taken into account. Economic benefits such as increased income, employment, productivity gain, better income distribution and opportunity for diversification are obvious. Social benefits such as time saving, school enrolment levels, access to health services, environmental improvement, skill development, capacity building, improved information and gender impact are less transparent. But in long term, this would be as or more effective in poverty reduction as they lead to sustained improvements in quality of life independent of income sources.

The Government of India as well as the State Governments has ventured into making heavy investment in agricultural infrastructure, having realised its importance in achieving faster rate of economic growth. The major focus of infrastructural investment has been on irrigation, transportation,
electric power, agricultural markets, etc., and these not only contributed to agricultural growth at the macro level, but also to wide disparity between different regions in terms of agricultural growth. Since the responsibility of providing infrastructure is with the State Governments, which aims at rapid growth of agricultural production for attaining other kinds of developmental goals such as poverty alleviation, there exists a tendency among the decision-makers to invest heavily in those areas where there is a potential for fast agricultural growth (Singh, 1983).¹

**DEFINITION OF INFRASTRUCTURE**

Infrastructure refers to the services drawn from the set of public works that traditionally has been supported by the public sector, though in many cases, they may be produced in the private sector as well. Water supply, sanitation, transportation, electricity, telecommunications, irrigation dams, regulated markets and banks are some of the examples of infrastructure that generate services. The agricultural infrastructure includes all of the basic services, facilities, equipments, and institutions needed for the economic growth and efficient functioning of the food and fibre markets. Infrastructural investment demands a strong commitment to the research and cooperative extension system that enhances production, marketing, food safety, nutrition, conservation of natural resource and all other functions of different agencies concerned with agricultural infrastructure (Thorat and Smita, 2002).²
IMPORTANCE OF INFRASTRUCTURE

One of the central questions in the economic growth paradigm is how different factors of production contribute to aggregate the output. This contribution is made by income earned by the factors of production, which in a perfectly competitive economy will match their marginal value products in the absence of externalities. If there are large externalities, there is a need for government intervention to achieve more efficient allocation of resources, though government intervention itself has its own costs. The fact that infrastructure services are often provided by the public sector means they are often not priced at all, or are rationed, and there will be difficulty even in estimating the private productivity of infrastructure capital (Ahmed and Hossain, 1990).³

Among all kinds of infrastructure, agricultural infrastructure plays an important role especially in the context of a developing country where a larger percentage of poorer section of the society depends on this sector for subsistence. The growth enhancing nature of infrastructure warrants a closer scrutiny of the relationship between the level of agricultural development and the level of agricultural infrastructure from the regional perspective. This assumes importance because, the agricultural sector plays a dominant role in alleviating poverty and the overall growth of the agricultural sector and its components such as growth of agricultural employment, income, output, etc depend largely on the level of investment made in infrastructure. In other
words, level of infrastructure in agricultural sector is one of the major factors that could explain the regional balances and imbalances in the agricultural growth (Aschauer, 1990).  

ROLE OF AGRICULTURAL INFRASTRUCTURE

Increased Agricultural Production and Productivity

It should be noted that infrastructure in the agricultural sector enhances the comparative advantages of that region in which the infrastructural investment is made. When the region gains comparative advantage in the agricultural activities, the net result is increase in production and productivity of various agricultural goods and services in general. An empirical study by Binswanger et al (1993) demonstrated that increased marketing infrastructure that includes components such as road facilities in India enhanced the total agricultural output with the elasticity of 0.20. However, one of the questions that need to be addressed here is that though there exists a direct correlation between the level of infrastructure and agricultural output at the macro level, whether the increased infrastructure at the regional level has resulted in balanced growth in the agricultural output among different regions.

Reduced Cost of Production

Development of agricultural infrastructure in a particular region not only enhances agricultural production and productivity but in many cases also reduces the marginal cost of production. An empirical study by Eberts (1990) demonstrated that the fertiliser usage in the agricultural sector increases with
the improvement in the quality of road. It should be noted that the transaction cost that generally falls outside the cost of input prices can be one of the major components of the total cost of production in the agricultural sector and infrastructure plays a dominant role in reducing the transaction cost. For example, the transportation cost incurred by the farmers in a particular region, both for transporting inputs to the field from the place of purchase and transporting the output to the market place for final sale, can be substantial in the absence of proper road & transportation facilities.

**Increasing Value Addition to the region**

The important benefit derived from the agricultural infrastructure is that it helps to increase the level of value addition in the region. Increased level of agricultural infrastructure in a particular region would lead to extend investment in allied sectors which can produce high value added products. The increased level of capital formation in a region due to the availability of agricultural infrastructure leads to derived demand for the investment in industries that produce value added commodities. For example, increased banking or agricultural training facilities introduced in a particular region may attract a new kind of investment in areas such as food processing, etc. (Ghosh and De, 1998).  

**Social Benefits**

Provision of initial level of agricultural infrastructure or enhancement of the existing one may lead to a different kind of cropping pattern that would
generate some indirect positive benefits which is called as social benefits. These benefits are enjoyed not only by the regional economic activities but also by activities beyond the administrative and political boundaries of the region. For example, introduction of a new technology such as sprinkler irrigation in a region may reduce the exploitation of groundwater in that particular region and this would make more amount of groundwater available for downstream farmers several miles away.

**Economies of Scale**

Some types of infrastructure may result in increased economies of scale that would increase agricultural income. The economies of scale is realised when the cost of production of a particular firm declines due to external advantages. Provision of one particular infrastructure for a specific objective may result in satisfying multiple objectives thereby increasing the economies of scale in the production activities. For example, rural electrification for providing electricity for the agricultural sector or rural road network may be helpful to small-scale industrial units that also consume electricity and utilise road for the production process (Venkatachalam, 2003).  

**Increased Producer and Consumer Welfare**

Certain types of agricultural infrastructure enhance improvements in producer as well as consumer surplus. Increase in the number of regulated market committees, increased availability of banking operations in rural areas, increased availability of transportation facilities, etc prevent the middle-men
and the money lenders from appropriating a substantial amount of producer and consumer surplus. It should be noted that the welfare of the producers and the consumers improves from the fact that increased infrastructural facility brings producers and consumers to one place where producer could get a higher price for his products and consumers could pay lower price for the same product (Majumdar, 2002).⁹

**RURAL INFRASTRUCTURE DEVELOPMENT IN INDIA**

The Government has taken various measures to improve the stock of infrastructural facilities in the rural areas, in which the Rural Infrastructure Development Fund (RIDF), which was set up by the Government of India in 1995-96, was an important one. It was created to provide funds to enable State Governments to complete medium and minor irrigation, soil conservation, watershed management and other rural infrastructure projects which were non-functional and incomplete due to lack of funds. Banks were expected to contribute to the extent of shortfall in achievement of priority sector lending targets and agriculture sector targets. Roads and bridges were added later and currently there are 31 major sectors that are covered by RIDF loans.

As per the phasing of projects under RIDF I to XIV, the total amount sanctioned till 2010-11 was Rs. 88359.09 crore against which disbursements aggregated to Rs. 56052.20 crore. Of the cumulative amount sanctioned upto March 2011, the maximum of about 43.4 per cent has been for roads and bridges followed by irrigation 33.0 per cent and 12.5 per cent for social sector
i.e. facilities like schools, drinking water and public health. The remaining 11.1 per cent went to power and other sectors which includes infrastructures for innovative farm, non-farm and service activities. The sector-wise order of share in terms of disbursements is the same as that of sanctions but it is more skewed in favour of roads and bridges and irrigation. The amount disbursed in per cent of phased amount is much higher for roads and bridges and power than average of all other sectors, indicating relatively quick implementation in these sectors.

At regional level, the Southern states consisting of Andhra Pradesh, Karnataka, and Kerala have the favourable share both in terms of sanctions (27.74 per cent) and disbursements (28.64 per cent) as compared to their share in population (20.43 per cent) and geographical area (19.35 per cent). Even their composite development index is higher (117 per cent) than all India (100). Whereas, the North East and Eastern states have unfavourable shares in sanctions (4.70 per cent) and disbursements (3.93 per cent) with respect to their geographical area (7.98 per cent) and population (3.80 per cent), respectively. Among the major states, Andhra Pradesh, Gujarat, Tamil Nadu, Haryana, Himachal Pradesh and Punjab have higher share in sanctions and disbursements than that of both area and population, whereas Maharashtra, Bihar, and Jharkhand have lower share, mainly due to their poor performance in utilisation and even repayment in case of the former states.
A better measure of efficiency in terms of percentage of disbursed amount with respect to phased amount is also available. It indicates that Uttrakhand, Punjab, Himachal Pradesh, Haryana, Tamil Nadu, Madhya Pradesh and Gujarat have higher utilization between 80 and 95 per cent while the states like Jharkhand, Orissa and Bihar have lower utilization between 55 and 66 per cent. Most of the states are common in the two measures and the shares with respect to their share of area and population are higher and lower, accordingly (Sangwan, 2011). This suggests that while efforts have been taken to augment the availability of rural infrastructure over the years, there have been huge spatial variations and not all facilities have been carried out in an uniform manner.

**STATEMENT OF THE PROBLEM**

Infrastructure plays a pivotal role in the development of any economy, which is true in both the rural and urban areas. Sector-wise, agriculture needs lot of infrastructural inputs that include irrigation, electricity, road, transport, market, insurance, etc. As agriculture is the backbone of a country’s economic growth and development, continuous augmentation of infrastructural facilities in the rural areas becomes inevitable. Faster agricultural growth is a necessary condition for the growth of other sectors and also for the required capital formation which is needed for the development of the industrial sector. The Government has to ensure continuous and increased investment in the rural
infrastructural facilities, since in the absence of which the sector and the people who are depending on it will begin to suffer.

In India, the First Five year plan provided the foremost importance to agriculture, which was not followed in the subsequent plans, which resulted in the severe food shortage during the 1960s and necessitated the introduction of Green Revolution. In the 1990s, the introduction of the structural adjustment programme under the New Economic Policy forced the Government to cut down its expenditure, for which the rural investment became the first casualty and the Gross Fixed Capital Formation (GFCF) became negative, immediately after the launch of the New Economic Policy. Agricultural sector suffered due to the cut in the GFCF, as its average annual growth rate stood at 3.1 per cent for the period 1990-91 to 1999-2000 and also for the period 1990-91 to 2010-11, against the average annual growth rate of the economy which stood at 5.6 per cent and 7.9 per cent for the two periods respectively (Government of India, 2011). Measures like RIDF has been implemented in order to promote rural infrastructure, but economic growth has become totally urban-centric in the last 20 years and thus, forcing the rural population to migrate abandoning agriculture. Agricultural sector has been shrinking in terms of the size of cultivable land and the number of crops being grown. In this background, it is necessitated to examine the extent of availability or the lack of infrastructural facilities in the rural areas, especially for agricultural operations and the problems faced by the farmers in availing the same.
SIGNIFICANCE OF THE PROBLEM

The share of agriculture in the total domestic product has come down to 10 per cent, though it still supports more than 60 per cent of the total rural population at the national level. The implementation of RIDF might have helped in the completion of some of the ongoing rural infrastructural projects, though there are serious policy problems in terms of price support mechanism, extension programmes, procurement policy, crop insurance schemes, etc. The urban based service sector-led economic growth has ignored the agricultural sector and the rural masses have lost their employment opportunities and the agricultural sector is severely crippled. Suicide of farmers is the clear reflection of the status of the agricultural sector and that of rural infrastructure. However, such suicides have not been found in Tamil Nadu, though rural-urban migration has been on the rise, indicating bleak future of the rural areas in the State. Hence, it is important to examine the position of the rural infrastructure and its role in agricultural development of the area in focus with the help of primary data, which is attempted in this study.

AREA OF THE STUDY

This study is based on the primary data collected from the farming households who reside in different villages with different levels of infrastructural facilities. For this purpose, Kanchipuram district in Tamil Nadu has been selected as the sample district. From Kanchipuram district, two taluks, viz., Kanchipuram and Uthiramerur have been selected. From these
two taluks and two villages from each of the taluk have been chosen, viz., Melottivakkam and Damal from Kanchipuram taluk and Sathanjeri and Perunagar villages from the Uthiramerur taluk as the sample villages. These four villages form the area on focus of this study.

**PERIOD OF THE STUDY**

This study analyses the role of rural infrastructure in the development of agricultural sector at the macro and micro level, for which primary and secondary data have been collected. Secondary data regarding the extent of net irrigated area, crop-wise irrigated area, availability of rural roads, use of electricity for agricultural purposes, use of pump sets, availability of institutional credit and regulated markets have been collected for the periods 1991-92 to 2009-10. At the micro level, data pertaining to the extent of availability of rural infrastructure has been gathered from the sample respondents through field survey, which has been conducted from October to December 2011.

**OBJECTIVES OF THE STUDY**

The following are the broad objectives of the present study:

1. To analyse the extent of availability of rural infrastructure at the all-India level;
2. To examine the degree of availability of infrastructural facilities in rural Tamil Nadu;
3. To scrutinize the socio-economic characteristics of the sample respondents in the study area;
4. To ascertain the degree of availability of the infrastructural facilities pertaining to the agricultural sector in the study area;
5. To evaluate the role played by rural infrastructure in agricultural development among the sample households in the study area; and
6. To suggest policy measures for the development of the agricultural sector.

HYPOTHESES OF THE STUDY

The following are the hypotheses of the study:

1. There is significant variation in the extent of availability of infrastructural facilities in the study area;
2. Availability of infrastructure is significantly associated with the nature of farming among the sample respondents in the study area;
3. There is significant difference in the level of annual income among the sample respondents in the study area; and
4. There is significant correlation between the availability of infrastructural facilities and agricultural development in the study area.

METHODOLOGY OF THE STUDY

The present study is based on both secondary and primary data. The secondary data pertaining to the extent of net irrigated area, crop-wise irrigated area, availability of rural roads, use of electricity for agricultural purposes, use of pump sets, availability of institutional credit and regulated markets at both all-India and Tamil Nadu levels have been collected from
various Government publications which include Statistical Abstract of India, Economic Survey, Agricultural Statistics at a Glance, Season and Crop Report of Tamil Nadu, Economic Appraisal of Tamil Nadu, Statistical Handbook of Tamil Nadu, reports of Centre for Monitoring Indian Economy, etc., for various years. These annual reports and publications have been accessed from libraries like Madras Institute of Development Studies, Connemara Public Library, Madras School of Economics, University of Madras, etc.

At the primary level, data from the sample respondents have been gathered through field survey with the help of a questionnaire. A standard questionnaire was framed for this purpose and a pilot survey was conducted. Based on this survey, necessary modifications were carried out in the questionnaire, which was used in the field survey. From the sample respondents, information regarding their identification, household members, size of land holding, wealth composition, household income and expenditure, types of irrigation, storage and marketing of crops, availability of electricity, roads and transport, finance, cropping pattern, output and yield of crops, and the impact of infrastructure has been gathered. These data have been examined on the basis of the sample villages of the respondents, their age, levels of education, community and other factors in order to find out the role of infrastructure in agricultural development in the study area. Moreover, in examining the role of infrastructural facilities in the extent of agricultural development in the study area, cropping pattern adopted by the sample
respondents, nature of farming, number of cropping and the type of labour they use and their annual income are taken as the important factors. Cost of cultivation is not considered, since it is expected that income of the farmers capture the role of infrastructure, markets and availability of storage. Also, farmers' income subsumes the effects of crop yield and it is not examined separately.

**SAMPLING DESIGN**

This study is based on multi-stage proportionate random sampling method. In the first stage, Kanchipuram as the sample district is purposely chosen, since it is one of the districts in Tamil Nadu where the dominance of agriculture is still quite considerable. In the second stage, two taluks, viz., Kanchipuram and Uthiramerur have been selected deliberately, since as far as its agricultural activities are concerned, both these taluks represent the district in a much better manner. In the third stage, four sample villages, two from each taluk have been selected: Melottivakkam and Damal from Kanchipuram taluk and Sathanjeri and Perunagar from the Uthiramerur taluk. Among these four villages, Sathanjeri in Uthiramerur taluk and Melottivakkam in Kanchipuram taluk are featured with low infrastructural facilities, while Perunagar in Uthiramerur taluk and Damal in Kanchipuram taluk are featured with better infrastructural facilities. In the fourth and final stage, the sample households have been selected. As the basic aim of the study is to analyse the role of infrastructural facilities in agricultural development, only the farming
households in the four sample villages form the population of this study. The number of total households, farming households and the sample households in the four sample villages are shown below:

<table>
<thead>
<tr>
<th>Taluk</th>
<th>Village</th>
<th>Total Households</th>
<th>Farming Households</th>
<th>Sample Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uthiramerur</td>
<td>Sathanjeri</td>
<td>587</td>
<td>388</td>
<td>97</td>
</tr>
<tr>
<td></td>
<td>Perunagar</td>
<td>648</td>
<td>412</td>
<td>103</td>
</tr>
<tr>
<td>Kanchipuram</td>
<td>Mel ottivakkam</td>
<td>640</td>
<td>423</td>
<td>106</td>
</tr>
<tr>
<td></td>
<td>Damal</td>
<td>543</td>
<td>375</td>
<td>94</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>1598</strong></td>
<td><strong>400</strong></td>
<td></td>
</tr>
</tbody>
</table>


From each of the sample village, 25 per cent of the farming households have been selected as the sample. Thus, from a total of 1598 farming households, 400 households have been selected. The main thrust while identifying the sample household was given to the cropping pattern and type of irrigation adopted by that household. Care was taken to include all segments of the farming households like, literate and illiterate, tiny, marginal, small, medium and large farmers, farmers belonging to Scheduled Caste (SC) and Scheduled Tribe (ST) and non-SC and ST so as to make the sample as much representative as possible.

**STATISTICAL TOOLS**

The gathered data have been analysed with the application of appropriate statistical tools. These include ratio analysis, diagrammatic representation, descriptive statistics, t-test, Chi-square test, ANOVA, Wilcoxon test and regression model.
LIMITATION OF THE STUDY

The object of the study is to trace the role of rural infrastructure in the agricultural development in the study area. For this purpose, data regarding the size of land holding, area under irrigation, cropping pattern, household income and expenditure, wealth composition, annual agricultural income, etc., have been gathered from the households. These data are expected to be accurate based on which the analysis is done. The sample households were not quite forthcoming in providing data regarding their size of land holding, farm income, wealth composition, etc., for obvious reasons. Time and monetary factors constrained the selection of number of villages and also the number of sample households.

PLAN OF THE STUDY

This study consists of seven chapters.

The First chapter provides the introduction about infrastructure and its role in agriculture apart from explaining the problem of the study and its significance. Area of the study, period of the study, objectives, hypotheses, methodology, sampling design and limitations of the study are also presented in this chapter.

Chapter two reviews the related literature. This includes studies made in India and other countries, theoretical and empirical studies done with the help of both secondary and primary data. Some of the important studies are reviewed in order to find out the research gap.
The profile of the study area – Kanchipuram district and the four sample villages - is presented in chapter three. The structure and position of the economy, demography, literacy level, land-use pattern, climate, structure of the workforce and others of Kanchipuram district are analysed with the help of secondary data.

The extent of availability of rural infrastructure at the All-India level and also in Tamil Nadu is examined with the help of secondary data in Chapter four.

Chapter five analyses the socio-economic characteristics of the selected sample households belonging to the four sample villages. This is done with the help of ratio analysis and diagrammatic representation. The total sample farmers are classified on the basis of sex, literacy status, size of land holding and community to compare and to bring out the existing differences among them.

In chapter six, the extent of availability of infrastructure is examined and the role of the stock of infrastructure in agricultural development among the sample households is also evaluated with the application of ratio analysis, diagrammatic representation and descriptive statistics. Moreover, the hypotheses are also tested with the help of tools like t-test, Chi-square test, ANOVA and regression model.
In the **seventh chapter**, summary of the whole work is presented and conclusions are derived on the basis of the analysis done. Findings of the study and some policy suggestions are also given in this chapter.
REFERENCES


