CHAPTER VII

SUMMARY, FINDINGS, SUGGESTIONS AND CONCLUSION
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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. Infrastructure investment demands a strong commitment to the research and cooperative extension system that enhances production, marketing, food safety, nutrition, conservation of natural resources, and all other functions of different agencies concerned with agricultural infrastructure. 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.

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. It is demonstrated that increased marketing infrastructure that includes components such as road facilities enhanced the total agricultural output.

The Government has taken various measures to improve the stock of infrastructural facilities in the rural areas, in which the 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 infrastructural projects which were non functional and incomplete for want 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 for irrigation and 12.5 per cent for social sector i.e. facilities like schools, drinking water and 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.

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 a 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 two 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, and that 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 GFCF became negative, immediately after the arrival 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. 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 leaving 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.

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 and service sector led economic growth has ignored the agricultural sector and the rural masses which have reduced their employment opportunities and the agricultural sector is severely crippled. Suicide commitment 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.

The review of the important studies indicates that many scholars have attempted to examine the role of different types of infrastructural facilities in agricultural development, rural development and also poverty reduction. While it is accepted that provision of infrastructural facilities influence agricultural development, the extent of such impact and that too on different segments of the farming community have not been brought out by these studies. It is not clear whether rural infrastructure is ‘scale neutral’, i.e., whether it benefits large, medium, small and marginal farmers alike. However, such a study cannot be done on the basis of secondary data, since data pertaining to different segments of farmers are not available. Hence, this study makes an attempt to fill this gap by collecting primary data from different segments of farmers about the role of infrastructural facilities on the extent of agricultural development in the study area. In this background, the following are the objectives of the present study: (i) to analyse the extent of availability of rural infrastructure at the all-India and level; (ii) to examine the degree of availability of infrastructural facilities in rural Tamil Nadu; (iii) to scrutinize the socio-economic characteristics of the sample respondents in the study area; (iv) to ascertain the degree of availability of the infrastructural facilities pertaining to the agricultural sector in the study area; (v) to evaluate the role played by rural infrastructure in agricultural development among the sample households in the
study area; and to suggest policy measures for the development of the agricultural sector.

**FINDINGS OF THE STUDY**

The extent of irrigation has gone up over the years at the All-India level and also in Tamil Nadu, though as a percentage of net sown area, only around 50 per cent of the area has been brought under irrigation, which underscores the fact that a lot of effort needs to be taken in improving the irrigational facilities.

There are lot of spatial variations in the availability of irrigation, electricity, institutional credit and other facilities.

In the case of Tamil Nadu, more than 95 per cent of the villages have been electrified, though as far as bank credit is concerned, only 54 per cent of the total credit is being extended to the farm sector, while there is no data to show which segment of the farming community has benefitted from this credit extension.

At the primary level, the proportion of male population in each of the village is more than 85 per cent and thus, females form around 15 per cent of the sample in each village.

The age-wise distribution of the respondents indicates that more than 68 per cent of them come under the age group of 31-55, and it is also the case in all the sample villages.
Among the male respondents, 41.7 per cent fall in the age group of upto 45 years, which is 59.7 per cent among the females, while 58.3 per cent of the male respondents belong to the above 45 years age group, which is 40.3 per cent among the female respondents.

The proportion of illiterates is around 10 per cent overall, which is more than 12 per cent in Sathanjeri and Mel ottivakkam, while it is less than 7 per cent in Perunagar and Damal villages.

The share of literates is higher among the male respondents (96.4 per cent) than that of the female respondents (58.1 per cent), while the proportion of illiterates is higher among the female respondents (68.4 per cent) than among the males (31.6 per cent).

The levels of education of the respondents vary markedly in the sample villages, though the proportion of those who are literate upto the higher secondary level is the highest, while the proportion of graduates is only around 10 per cent in all the villages. This suggests a low level of education among the sample respondents in the study area. Moreover, there are also considerable differences in the levels of education among the villages, since, the proportion of illiterates is higher in Sathanjeri and Mel Ottivakkam (65.8 per cent) than in Perunagar and Damal villages (34.2 per cent), while the proportion of graduates is higher in Perunagar and Damal (68.4 per cent) than in Sathanjeri and Mel Ottivakkam villages (31.6 per cent).
The Sex-wise educational levels of the respondents indicate that the proportion of not only illiterates, but also that of those who are literate upto the primary level is less among the male respondents (20.7 per cent) than among the female respondents (25.8 per cent), but the proportion of those who are literate upto the higher secondary level and graduates is higher among males (41.8 per cent) than among females (14.6 per cent).

The proportion of respondents who belong to the BC is the highest (44.5 per cent) followed by that of MBC (36.3 per cent), SC & ST (14 per cent) and finally the OC (5.3 per cent). The same trend is seen among the male and female respondents too, though the proportion of each community differs.

Village-wise, the percentage of respondents who belong to the BC is the highest in Perunagar and Mel ottivakkam, while the proportion of SC and ST respondents is higher in Sathanjeri and Perunagar than that of Mel ottivakkam and Damal.

The share of illiterates is either ‘nil’ or less among the OC and BC respondents, compared to that of those who belong to the MBC and SC & ST communities, while the proportion of graduates is higher among the BC respondents than that of those who belong to the MBC and SC & ST communities. Moreover, this also underscores the fact that those who are literate higher than higher secondary among the OC respondents, do not engage in agriculture.
The percentage of respondents who reside in solid & permanent (pucca) houses is the highest (60.5 per cent) among the respondents, while around 8.5 per cent of them also reside in huts. The proportion of respondents who reside in huts is the highest in Sathanjeri (35.3 per cent), while those who reside in pucca houses are the highest in Perunagar (31.4 per cent), closely followed by Damal (31 per cent).

On the basis of their sex, in the case of the male respondents, only 4.7 per cent reside in huts, which is 29 per cent among the females, while 65.4 per cent of the male respondents reside in pucca houses, which is only 33.9 per cent among their female counterparts. This underscores the worse living conditions of the female respondents than that of their male counterparts.

Community-wise, the proportion of respondents who reside in huts is higher among the MBC (8.3 per cent) and SC & ST communities (28.6 per cent) than that among the OC (nil) and BC communities (3.4 per cent), while the proportion of respondents who reside in pucca houses is higher among the OC (61.9 per cent) and BC communities (71.3 per cent) than among the MBC (57.9 per cent) and SC & ST communities (32.1 per cent).

The proportion of respondents who live in joint families is less than 25 per cent in Melottivakkam and Damal, while it is more than 25 per cent in Sathanjeri and Perunagar.

The share of respondents who live in nuclear families is higher among the males (74.3 per cent) than among the females (38.7 per cent), while the
proportion of respondents who live in joint families is higher among the females (61.3 per cent) than among the male respondents (25.7 per cent).

Among the sample respondents, 40.8 per cent own only upto 2.5 acres of land, while 59.2 per cent hold more than 2.5 acres. Among the sample villages, 47.5 per cent of the respondents who reside in Sathanjeri possess upto 2.5 acres of land, which is 28.2 per cent in Perunagar, 52.9 per cent in Mel ottivakkam and 35.1 per cent in Damal.

In the case of the male respondents, 36.4 per cent own upto 2.5 acres, which are 64.5 per cent among the female respondents, while 63.6 per cent of the male respondents possess more than 2.5 acres of land, which is 35.5 per cent among their female counterparts. This undeniably underlines the disparity in land holding between the male and female respondents in the study area.

The community-wise land holding of the respondents suggests that among those who belong to the BC, 29.2 per cent possess upto 2.5 acres of land, which is 38 per cent among the MBC, 57.1 per cent among the Other Community and 78.5 per cent among the SC & ST communities, while 70.8 per cent of the respondents who belong to the BC possess more than 2.5 acres of land, which is 62 per cent among the MBC respondents, 42.9 per cent in the case of OC respondents and only 21.5 per cent among the SC & ST respondents.
Thus, land possession is the least in the case of the SC & ST respondents, followed by the OC and MBC respondents, while it is the highest among the BC respondents in the study area.

The proportion of respondents who earn upto Rs. 50000 per annum is 33.5 per cent among the males and 74.2 per cent in the case of females, while the proportion of respondents who earn above Rs. 50000 per annum is 66.5 per cent among the males and which is only 25.8 per cent among the females, which brings out the differences in the income earning capacity between the two genders in the study area.

The community-wise annual income suggests that among the respondents who belong to the OC community, 42.8 per cent earn upto Rs. 50000 per annum, which is 27 per cent among the BC respondents, 43.5 per cent in the case of MBC respondents and 69.7 per cent among the SC & ST respondents; on the other hand, 57.2 per cent of OC respondents earn above Rs. 50000 per annum, which is 73 per cent, 56.5 per cent and 30.3 per cent among the BC, MBC and SC and ST respondents respectively, which brings out the underlying differences in the income levels among the sample respondents in the study area.

Among those who own upto 1 acre, 71.5 per cent earn upto Rs. 50000 per annum, which is 56.1 per cent among those who possess 1.1-2.5 acres, 31.7 per cent among those who hold 2.6-5.0 acres and 14.1 per cent in the case of those who own more than 5 acres of land. On the other hand, the
proportion of respondents who earn above Rs. 50000 per annum is 28.5 per cent, 43.9 per cent, 68.3 per cent and 85.9 per cent in the successive land size classes respectively. This indicates positive correlation between the level of annual income and size of land holdings among the respondents in the study area.

Land value of the respondents shows that the male respondents possess land worth of upto Rs. 5 lakhs, which is 75.8 per cent among the females, while 38.5 per cent of the males own above Rs. 5 lakhs worth of land, which is 24.2 per cent among the females. Thus, the value of land possessed by the male respondents is higher than their female counterparts.

Possession of building indicates that 58 per cent of the male respondents possess building worth of upto Rs. 5 lakhs, which is 72.6 per cent among the females, while 42 per cent of the males own above Rs. 5 lakhs worth of building, which is 27.4 per cent among the females.

Possession of livestock by the respondents suggests that 71 per cent of the male respondents possess livestock worth of upto Rs. 1 lakh, which is 79 per cent among the females, while 29 per cent of the males own above Rs. 1 lakh worth of livestock, which is 21 per cent among the females. Thus, there is only a meagre difference in the value of livestock owned by the sample respondents.

Among the males, 66.3 per cent possess upto Rs. 2 lakhs worth of agricultural implements, which is 83.9 per cent among the females, while 33.7
per cent of the males own above Rs. 2 lakhs worth of implements, which is 16.1 per cent among the females.

The possession of consumer durables among the respondents suggests that 66.8 per cent of the male respondents own up to Rs. 1 lakh worth of consumer durables, while 79.1 per cent of the females come under this category, whereas 33.2 per cent of the males possess above Rs. 1 lakh worth of consumer durables, which is 20.9 per cent among the females. Thus, in the case of consumer durables too, a greater proportion of the male respondents own higher value of consumer durables than their female counterparts in the study area.

There is a considerable amount of discrepancy in the value of the assets possessed by the respondents, which emanate from the differing size of land holding and their annual income. The income and asset values are the highest in Perunagar, followed by that of Damal, Mel ottivakkam and Sathanjeri in the descending order. Standard deviation also reiterates the point that there are huge variations within the villages as well.

The proportion of respondents who spend above Rs. 3000 per month is 21.6 per cent in Sathanjeri, 41.8 per cent in Perunagar, 22.7 per cent in Mel ottivakkam and 48.9 per cent in Damal, which shows that spending capacity of the respondents who reside in Perunagar and Damal is higher than that of those who belong to Sathanjeri and Mel ottivakkam.
In the case of non-food expenditure also, the spending capacity of those who reside in Perunagar and Damal is higher than that of those who belong to Sathanjeri and Mel ottivakkam. For instance, the share of those who spend more than Rs. 3000 as their non-food expenditure per month is 27.9 per cent in Sathanjeri, 51.5 per cent in Perunagar, 30.2 per cent in Mel ottivakkam and 54.2 per cent in Damal.

The type of irrigation adopted by the respondents indicates that more than 46 per cent of the sample respondents depend on tank irrigation, while 40.6 per cent depend on well irrigation, in which the dependence on dug well is around 30 per cent and 10 per cent use drip irrigation system. In all the villages, dependence on tank irrigation is more than 40 per cent, while the use of dug well is more than 30 per cent in Sathanjeri and Perunagar, while it is less than 30 per cent in Mel ottivakkam and Damal.

The share of respondents who depend on tank irrigation is 50.6 per cent among the males, which is 24.2 per cent among the females; 26.3 per cent of the males depend on dug well, which is 48.4 per cent among the females, while those who depend on drip irrigation system is 10.1 per cent among the males and 6.5 per cent among the females. This indicates that the female respondents depend more on dug well and canal irrigation which are less secure and less consistent.
The dependence on types of irrigation like canal, tank and dug well is more among the SC & ST respondents (87.5 per cent) compared to that of BC (78.7 per cent) and MBC respondents (80 per cent).

Among the male respondents, 44.4 per cent depend on regulated markets, which is only 9.7 per cent in the case of the female respondents. They are not able to market their produce in a proper manner, due to their inability to take it to the market, wait for the right time, or store the produce. Most of the female respondents resort to forced selling, as they are highly indebted and thus, are unable to wait for the right time to market their produce. This leads to further impoverishment, which creates a kind of vicious cycle.

The percentage of respondents who could access the regulated markets increases successively as one moves from the lowest to the highest level of income. For instance, it moves up from 6.6 per cent, 14.3 per cent, 51.3 per cent and to 69.1 per cent in the income levels of upto Rs. 25000, Rs. 25001-50000, Rs. 50001-1 lakh and above Rs. 1 lakh respectively. This underscores the fact that those who earn more are able to wait for the Government procurement and access the regulated market more, which further pushes up their economic condition and that creates a sort of virtuous cycle.

The analysis indicates that in none of the sample villages, electricity is available for more than 14 hours, while even the availability of electricity for more than 10 hours duration is quite less. This will have important implication
for the use of energised pumpsets and the cost involved in maintaining the same.

The extent of use of the energised pumpsets is higher in Perunagar (30.5 per cent) and Damal (27.9 per cent) than that of Sathanjeri (20.2 per cent) and Mel Ottivakkam (21.3 per cent).

The proportion of respondents who use the energised pumpsets consistently increases, as the size of land holdings increases. For instance, it goes up from 10.7 per cent, 58.9 per cent, 80 per cent and 100 per cent in the land size classes of upto 1 acre, 1.1-2.5 acres, 2.6-5.0 acres and above 5 acres respectively.

In the case of the respondents who reside in Sathanjeri, only 30 per cent indicate that nearest road is less than 2 kms away, which is 83.5 per cent in Perunagar, 32.1 per cent in Mel ottivakkam and 86.2 per cent in Damal. This underscores the point that Sathanjeri and Mel ottivakkam lack in road facilities, compared to that of Perunagar and Damal. Farther the distance to the road, higher the cost that should be borne by the respondents in accessing the market, which will dissuade some of them in marketing their produce, thereby, affecting their revenue earning capabilities. This will also seriously reduce the degree of commercialised cropping and the quantum of agricultural produce available in the market.

The analysis implies that while 68 per cent indicated that they have road facility in their villages, only 58.8 per cent state that they have proper transport
facility in their villages. Moreover, village-wise, more than 80 per cent of those who reside in Perunagar and Damal suggest that they have transport facility, which is less than 40 per cent in the case of Sathanjeri and Mel ottivakkam.

Only around 20 per cent of the total respondents either strongly agree or agree that they could avail bank credit, which is less than 10 per cent in Sathanjeri and Mel ottivakkam and around 30 per cent in Perunagar and Damal. Hence, even though the Government has announced agriculture as the priority sector for lending purposes, accessing bank credit is still difficult, as the bankers are highly reluctant in lending to the farmers. Most of the farmers still remain ‘unreached’ as far as institutional credit is concerned.

The sample respondents face varied difficulties in accessing bank credit, foremost among them being providing collateral / security to access credit, which is also the same in the sample villages. This brings out the fact that the small, marginal and tiny farmers, who possess very small size of land, find it difficult to satisfy the procedures in accessing bank credit.

The percentage of respondents who opine that providing collateral is the difficulty that they face is especially higher among those who possess upto 1 acre (64.3 per cent) and 1.1-2.5 acres (50.5 per cent) than among those who hold 2.6-5.0 acres (37.9 per cent) and above 5 acres of land (25 per cent), while the proportion of respondents who opine that the inordinate delay in accessing credit is the difficult aspect, successively goes up with the size of land holding. This brings home the point that the Government needs to enact
measures which will avoid asking for collateral/security from the small and marginal farmers while accessing credit and the procedures should also be simplified, as most of the farmers are illiterate or less educated, which will also bring down the time taken in sanctioning the credit.

The proportion of respondents who opine that providing collateral/security is the major difficulty that they face in accessing bank credit successively decreases, as the level of income increases. For instance, it is 65.6 per cent in the case of those who earn upto Rs. 25000, which declines to 51 per cent, 37.5 per cent and 22.2 per cent in the successive higher income classes. This again reinforces the point that the vulnerable sections of the society, ironically who are in greater need of institutional credit, could not access them, since their ‘creditworthiness’ is less.

The village-wise dependence on private money lenders suggests that it is greater in Sathanjeri (91.8 per cent) and Melottivakkam (93.4 per cent) than that of Perunagar (53.4 per cent) and Damal (54.3 per cent). Thus, in all the villages, dependence on private money lenders is more than 50 per cent, while it is more than 90 per cent in the case of Sathanjeri and Melottivakkam.

Even among those who possess above 5 acres, more than 44 per cent depend on private money lender, which underscores the degree of vulnerability of the farming community in depending on private money lenders.

Income level-wise, the dependence on private money lenders is 100 per cent and 91.8 per cent in the income slabs of upto Rs. 25000 and Rs. 25001-
50000, while it is 76.3 per cent and 25.9 per cent in the Rs. 50001-1 lakh and above Rs. 1 lakh income classes.

Among those who own upto 1 acre, most of them cultivate paddy (37.5 per cent) as their major crop and groundnut (41.1 per cent), while only less than 10 per cent cultivate sugarcane and banana, and none of them cultivates horticultural and floricultural crops. On the other hand, among those who possess more than 5 acres, only a few cultivate paddy, none of cultivates groundnut, while most of them cultivate sugarcane, banana, horticultural and floricultural crops.

In the case of those who cultivate commercial and high value crops like sugarcane, banana, horticultural and floricultural crops, most of them use tube well and drip irrigation system, while those who cultivate paddy and groundnut depend more on canal, tank and dug well irrigation methods.

Among those who cultivate paddy, 55.6 per cent earn only upto Rs. 50000 per annum, which is 100 per cent in the case of groundnut, 9.6 per cent in the case of sugarcane, 34 per cent in the case of banana, 33.3 per cent in the case of those who cultivate horticultural crops and ‘nil’ in the case of floricultural crops. This underlines the relationship between the nature of crops being cultivated and their income level. On the other hand, among those who cultivate paddy, 44.4 per cent earn more than Rs. 50000 per annum, which is 90.4 per cent in sugarcane, 68 per cent in banana, nil in groundnut, 66.7 per cent in horticultural crops and 100 per cent in the case of floricultural crops.
As far as those who hold upto 2.5 acres are concerned, 82 per cent (137 out of 163 respondents) practice subsistence farming, while only 18 per cent (26 out of 163 respondents) market their produce. On the other hand, out of the 237 respondents who hold above 2.5 acres, 30 (22.6 per cent) produce for their own needs, while the remaining 207 respondents (77.4 per cent) adopt commercial farming.

Among those who possess upto 2.5 acres, 64.4 per cent (105 out of 163 respondents) crop once, while 28.8 per cent (47 out of 163 respondents) crop twice and 6.7 per cent (11 out of 163) crop thrice. On the other hand, out of the 237 respondents who hold above 2.5 acres, 70 (29.5 per cent) crop once, 126 respondents (53.2 per cent) crop twice and 51 (21.5 per cent) crop thrice. Thus, the possibility of cropping more than once goes with the size of land holding among the sample respondents in the study area.

In the case of those who use family labour, 57.1 per cent hold upto 2.5 acres and 42.9 per cent own above 2.5 acres, while in the case of those who use hired labour, 7.6 per cent hold upto 2.5 acres, while 92.4 per cent possess above 2.5 acres of land. This suggests that hired labour is greater among those who own more than 2.5 acres than among those who hold less than 2.5 acres of land.

Subsistence farming is higher in Sathanjeri (67 per cent) and Melottivakkam (66 per cent) than in Perunagar (17.5 per cent) and Damal (14.9 per cent), while commercial farming in higher in Perunagar (82.5 per cent) and
Damal (85.1 per cent) than in Sathanjeri (33 per cent) and Mel ottivakkam (34 per cent). The type of farming adopted by a farmer depends on various factors like the ability to market the produce, availability of market, better road and transport facilities which enable the farmer to go for commercial farming, as it takes place in villages like Perunagar and Damal, while in the absence of such infrastructural facilities, farmers are compelled to go for subsistence farming. Moreover, commercial farming is not only capable of increasing the earning capacity of the farmers, but also provides greater freedom in selecting their basket of goods for consumption compared to that of subsistence farming. This is even more meaningful in a time when the price levels of the commodities are continuously on the rise.

Among those who cultivate only one crop, 39.4 per cent belong to Sathanjeri and 44.6 per cent reside in Mel ottivakkam, while it is 8.6 per cent in Perunagar and 7.4 per cent in Damal. On the other hand, among the respondents who crop thrice, 7.7 per cent belong to Sathanjeri, 9.6 per cent to Mel ottivakkam, while Perunagar accounts for 42.3 per cent and Damal accounts for 40.4 per cent. Hence, it is clear that villages like Perunagar and Damal which provide better irrigational facilities enable the farmers to go for more than one cropping, while in villages like Sathanjeri and Mel ottivakkam, where dependence on irregular and unsecure irrigational facilities is higher, more than 70 per cent of the farmers crop only once.
The use of hired labour is higher in Perunagar (60.2 per cent) and Damal (55.3 per cent) than in Sathanjeri (8.2 per cent) and Mel ottivakkam (9.4 per cent), while the latter two villages use more of family labour. The use of hired labour ensures employment generation in the rural areas, which can spur agricultural development and rural development.

Around 40 per cent of the respondents earn only upto Rs. 50000 per annum from their agricultural activities, which is very meagre. Among the sample villages, 49.5 per cent of the respondents who belong to Sathanjeri earn upto Rs. 50000 per annum, which is 34 per cent in Perunagar, 49 per cent in Mel ottivakkam and 25.6 per cent in Damal; on the other hand, 50.5 per cent of the respondents who reside in Sathanjeri earn above Rs. 50000 per annum, which is 66 per cent, 51 per cent and 74.4 per cent in Perunagar, Mel ottivakkam and Damal respectively.

Multivariate regression analysis indicates that all the independent variables are statistically significant in explaining the change in the income levels of the sample respondents. The value of the slope coefficients for the villages increases from $VILL_1$, $VILL_2$ to $VILL_3$ indicating the fact that better infrastructural facilities definitely increases the income level of the farmers. It is highest in the case of Perunagar, since it provides the best facility, followed by Damal and Mel ottivakkam in the descending order. CROP is statistically significant which implies that as the number of cropping increases, the level of income also increases. Similarly, ‘Farm’ is positively significant at 1 per cent
level in influencing the levels of income of the sample respondents. This shows that those who adopt commercial farming through the cultivation of sugarcane, banana, horticultural and floricultural crops could earn more than those who practice subsistence farming. ‘Land’ is also positively related with income, since it is understood that larger land size leads to higher levels of income.

Testing of hypothesis suggests that there is a significant variation in the distance to the road, as some of the villages (Sathanjeri and Mel ottivakkam) are remote compared to others (Perunagar and Damal). Moreover, there is a significant association between the availability of infrastructural facilities in the sample villages and the nature of farming among the sample respondents in the study area. The villages like Sathanjeri and Mel ottivakkam lack some of the infrastructural facilities compared to those of Damal and Perunagar. The positive sign for linear-by-linear association suggests that there is more commercial farming in villages like Damal and Perunagar than that of Sathanjeri and Mel ottivakkam. This statistically proves the fact that provision of better infrastructural facilities will enable the farmers to take up commercial farming, which will increase their bargaining power, amount of revenue earned and also the quantity of marketed surplus.

There is also statistically a significant difference in the annual income levels of the sample respondents in the study area. As noted earlier, the respondents who reside in Damal and Perunagar earn considerably higher
than those who belong to Sathanjeri and Mel ottivakkam, which is influenced by the degree extent the infrastructural facilities are available in those villages.

There is a statistically significant relationship between the degree of availability of infrastructural facilities in the sample villages and the level of agricultural development measured in terms of number of cropping. A greater number of the sample respondents in the villages which have better infrastructure (Damal and Perunagar) could go for more than one cropping than those who reside in the villages which have poor infrastructure (Sathanjeri and Mel ottivakkam).

**SUGGESTIONS**

The following suggestions have been made on the basis of the analysis and field survey:

- Rural roads help farmers to have better access for agricultural inputs like fertiliser and allow them to better market their surpluses. Irrigation can permit farmers to cultivate their land more intensively and sometimes increase the number of annual yields, which may allow them to move out of subsistence production and into cash production.

- Above all, infrastructure such as roads may offer indirect benefits on rural quality of life by allowing people greater access to social services such as health clinics and schools. This is an example of a social multiplier, because better health is not simply a good itself but is also linked to higher incomes because, as many authors have shown,
healthier individuals have higher productivity and are more likely to be in the labour force.

- The sample villages lack basic infrastructural facilities which are especially worse in Sathanjeri and Mel ottivakkam. In Damal and Perunagar, the facilities are comparatively better than Sathanjeri and Mel ottivakkam. Thus, enhanced investment in the rural infrastructure is called for to augment agricultural and rural development.

- Rural infrastructure, particularly institutional credit is not scale neutral, since those who have better creditworthiness, access bank credit more easily than others. However, overall availability of bank credit is quite less and even among those who could access it, there is huge delay in getting a loan sanctioned. This calls for simplification of procedures and formalities which are related with bank credit.

- Demanding collateral / security as a pre-condition for credit sanctioning is especially severe on the tiny, marginal and small farmers, who possess very little land. Hence, the Government can bring in necessary modifications in order to enable the vulnerable sections of the farming community to access bank credit.

- Secured irrigational facility is an important factor which influences the choice of nature of farming, number of cropping and also the nature of crops being cultivated by the farmers. Those with assured irrigation can go for high value crops and commercial farming and can cultivate more
number of times. Hence, the Government needs to invest in creating more irrigational facilities.

- Provision of better roads in the rural areas is quite necessary as it enables not only quick and easy access to inputs, but also to better marketing facilities.
- Besides roads, availability of better transport also facilitates easy carrying of the necessary inputs into the rural areas and the produce out of the rural areas. The Government has to ensure frequent and better transport access to the farmers who especially cultivate floricultural and other perishable crops.

CONCLUSION

Infrastructure plays a crucial role in the development process through its contribution to increasing productivity of factors. Its primary role is to promote growth. Investment in rural infrastructure is instrumental in enabling farmers to adopt new technologies in agriculture and promote the growth of the economy. This, in turn, not only leads to increases in the productivity and income of the poor, small and marginal farmers, among others, but also results in providing more employment to the landless labour both in agriculture and in allied and non-farm activities.

This study brings out the fact that access to infrastructural facilities is greater among those who have larger land size and thus get a higher income, since they command better creditworthiness in the credit market and also in
the labour market. Their ability to store the produce, wait for the Government’s procurement and the capital capability enable them to earn more; on the other hand, the tiny, marginal and small farmers suffer, especially due to the fact that they are not able to avail the institutional credit market, forced to depend on the private money lenders, become highly indebted and in the process lose their produce to the lenders. Moreover, they either go for subsistence farming or cultivate low value crops, which further push them down into a vicious cycle. This vicious cycle can be broken only by the active intervention of the Government in terms of assured credit facilities and other infrastructural facilities.

Investment in rural infrastructure is capital intensive and the low agricultural prices may make ex-ante assessment of infrastructure projects look questionable. However, without these investments, a large area of the world will continue to be unable to contribute significantly to economic growth, a large portion of the world’s current and future population will be relegated to poverty, hunger, and human misery, and deteriorations in equity and stability will affect all.