

IMPACT OF BANK FINANCE FOR MINOR IRRIGATION IN TRICHUR DISTRICT

By

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THESIS

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requirement for the degree of

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Faculty of Agriculture
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DECLARATION

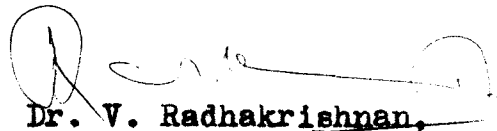
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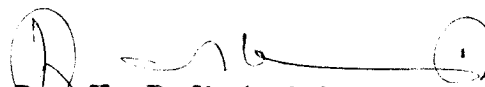


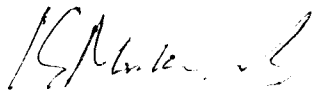
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Introduction

INTRODUCTION

Farm business units in India are generally small and are subsistence oriented, so that the bulk of the farmers have little surplus left with them, after meeting their essential family expenses. They find it difficult to meet even their cultivation expenses from their own surpluses. Threatened as he is, by the vagaries of the monsoon, the soaring costs of inputs and the fluctuating prices of the produce, the Indian farmer always finds himself in a pool of debts. Credit, at reasonable costs and at suitable terms and conditions, therefore becomes essential for the continuance of farming activity on the one hand and for agricultural prosperity on the other. It becomes increasingly so, when the cultivator use modern technology which requires more finance than is the case with traditional methods of farming. This much needed input is now being supplied to farmers by a number of agencies - both non-institutional and institutional. Amongst the institutional agencies, commercial banks now play a very important role.

Until 1968, agricultural finance was not within the purview of activities of commercial banks. Agricultural advances made by banks were in the form of indirect finance. However, social control on banks introduced in 1968 and the nationalization of the fourteen major commercial banks in

1969, paved the way for many major changes in the banking operations in the country. Following nationalization, commercial banks started making conscious efforts to channelize more credit into priority sectors like agriculture and small industry. Starting from this and till todate, the commercial banks have made commendable progress in financing the priority sectors.

In a bid to perform the task of priority sector lending more effectively, the banks began to spread wider and deeper into the rural areas. As at the end of June 1981, there were 35706 offices of commercial banks in the country of which 17658 (49.4%) were in rural areas. The corresponding figures for 1969 were 8232 and 1832 (22%) respectively. The population coverage per branch decreased from 65000 per branch in 1969 to 19000 per branch in 1981. A major concern in the branch expansion policy of the commercial banks now is to open branches in areas which have not been served by them so far. Thus, out of the 3291 new offices opened during 1980-81, 2461 were in hitherto unbanked centres.

Scheduled commercial banks' advances to priority sector increased from Rs.504 crores in June 1969 to Rs.5677 crores in March 1980, of which Rs.2286 crores was for agriculture alone. Share of priority sector lending in total non-food credit of scheduled commercial banks increased from 15% in 1969 to 37% in June 1980.

Commercial banks have introduced a number of schemes for development of agriculture and allied activities. They give two types of direct finances to agriculture. One is production loan or crop loan which is given for cultivation of crops or other operational expenses. The other is investment loan which is intended for making investments in the farm which includes (a) purchase of implements and machinery, (b) development of irrigation through sinking of new wells, renovation of old wells, installation of diesel and electric pumpsets and installation of lift irrigation systems, (c) Land reclamation and (d) development of horticulture, dairying, fisheries, etc.

Financing of minor irrigation forms an important arena in the investment financing activity of banks, as the development of irrigation is identified as one of the major pre-requisites for exploitation of modern technology. Commercial banks advance medium term loans for minor irrigation, i.e., digging of new wells, deepening of old wells and installation of pumpsets, at an interest rate of 12.5% per annum. By and large, these loans are advanced against collateral of assets created out of the loan, supported by mortgage of land, and where necessary personnel guarantee acceptable to the bank. Usually, pumpset loans are made against hypothecation of the asset and personal guarantee.

According to Dr. R.K. Hagari, the former Chairman of ARDC "the aim of financing agricultural development is not to distribute money. The ultimate aim is to increase agricultural output to increase employment, so that there are more man-days of work in a year, to create funds for sustained investment for a long time to come, so that the farmers not only repay the loan, but they also have a higher standard of living and a higher amount of savings on a long term basis in order to be able to afford the development for a much longer time to come". The aim of the present study is to assess how far the commercial banks in Trichur have progressed in achieving the above objective.

Under the Lead Bank Scheme which came into being in 1969, the Lead Banks are expected to act as a consortium leader and invoke the co-operation of other banks in the district in mobilization of deposits, locating actual and potential credit needs and catering for them. They are supposed to set the pace for the banking activities in the district. It was felt that it would be very appropriate to concentrate the present study on Impact of Bank Finance for Minor Irrigation in Trichur on the relevant activities of the Lead Bank of the district. Hence, Canara Bank which is the Lead Bank in Trichur District was selected for the study. Data for the study was generated through a sample survey of beneficiaries of the scheme of financing minor irrigation programme

of the Canara Bank. The specific objectives of the study were to examine the following.

1. Characteristics of the borrowing farmers.
2. Improvements in farming practices after irrigation.
3. Changes in crop output and yield rates.
4. The impact of irrigation on farm employment and income.

The thesis is divided into six chapters including the present one. A brief description of the socio-economic conditions of the study area, i.e., Trichur district is given in the second chapter. The third chapter contains a brief review of research work done in the field of bank finance for agriculture. The methodology adopted for collection, analysis and interpretation of data is described in detail in Chapter IV. The results of the study are presented and discussed in detail in the fifth chapter. A summary of the main findings of the study is presented in the sixth and the final chapter.

It is hoped that the results of the study would help to orient the lending policies of the banks to field conditions and thereby lead to greater developmental impact.

Area of Study

AREA OF STUDY

Trichur district is situated between 10° and $10^{\circ} 4'$ North latitudes and $75^{\circ} 57'$ and $76^{\circ} 54'$ East longitudes. It is bounded on the north by Palghat and Malappuram districts and on the east by Palghat and Coimbatore districts. Ernakulam and Idukki districts lie to the south and Arabian sea on the west.

There are five taluks in the district, viz., Thalappilly, Trichur, Chavakkad, Kodungallur and Mukundapuram. The district is divided into 17 N.E.S. blocks spreading over 98 panchayats. There are 251 revenue villages and 10 towns in the district.

Area

The total geographical area of the district is 2993.9 sq.km which forms 7.8% of the total area of the state.

The district can be divided into three natural divisions, viz., (1) Highland (2) Midland and (3) Lowland. Tea, coffee, and rubber are the main crops in the highland. In the midland plains, coconut, arecanut, cashew and other perennial crops are grown. In addition, paddy and vegetables are also cultivated. Coconut is the main crop in the sandy coastal belt which stretches over a length of 51.5 km from Kodungallur to Chavakkad. A number of streams and backwaters supply water to the low lying areas and make them fertile.

Population

According to 1981 census, Trichur supports a total population of 24.37 lakhs of which 19.22 lakhs (78.88%) is rural and 5.14 lakhs (21.12%) is urban. Density of population was 804 persons/sq.km. Females outnumbered males and the sex ratio was 1102.

The literacy according to 1981 census was 72.32%. The literacy was higher in the case of men - 75.98%-than in the case of women (68.99%).

Agriculture is the mainstay of the people in Trichur, providing employment to 45.7% of the total working force in the district. About 41.6% income of the district also accrues from agriculture.

Water resources

Bharathapuzha in the northern boundary and Periyar in the southern boundary form the main water resources of the district. Kecheri, Karuvannur and Chalakudy are the other rivers. The important water-ways are (1) Puthenthodu, (2) Shanmugham canal and (3) Canoli canal.

Climate and rainfall

Trichur has a tropical humid climate. The summer is oppressively hot with the average daily maximum temperature in March-April about 31-32°C in the coastal regions and 36°C

to 37°C in the interior. Table 2.1 shows average monthly rainfall in Trichur for the year 1980-'81.

Soil

Four types of soil are seen in the district, viz., sandy, alluvial, laterite and forest soil. The soil of the coastal taluks of Chavakkad and Kodungallur vary from almost pure sand to sandy loam and are deficient in almost all major plant nutrients and calcium. The lowlying regions of Trichur and Mukundapuram taluks have alluvial soils which are rich in organic matter and potash, but deficient in phosphorus and calcium. Laterite soil is seen in Trichur and Talappilly taluks. Forest soil is confined to the eastern region comprising of Talappilly, Mukundapuram and Trichur taluks.

Irrigation

The district is rich in water resources. Canals, tanks, reservoirs formed by constructing embankments across the canals or streams and the major and minor irrigation projects are the major sources of irrigation. The presence of lakes like Enamakal, Manakkodi, Muriyad and Kattakambal offers good scope for lift irrigation. According to 1977-78 data, Trichur stood third in the state in the matter of area irrigated, with 75310 ha under irrigation and paddy is the main irrigated crop as revealed by Table 2.2.

Four major irrigation projects are operating in Trichur district. They are (1) Peechi, (2) Chalakudy River Diversion Scheme, (3) Vazhani Scheme and (4) Cheerakuzhy irrigation project.

The abundant water resources in the district offer tremendous scope for minor irrigation and the gross area irrigated by minor irrigation was 16559 ha in 1978-79.

Land use pattern

The total area and classification of the area in Trichur district is given in Table 2.3. The data makes it clear that extensive cultivation offers little scope for increasing agricultural production, the cultivable waste land accounting for a meagre 1.72% of the total area.

Cropping pattern

Rice, coconut, arecanut, tapioca and banana are the major crops in the district. The proportion of area under rice did not show much change during the period 1960-1978, eventhough it declined in 1970-71. Area under ragi, pulses and cashewnut decreased considerably over the period, whereas the area under banana, ginger, pepper, rubber and turmeric increased. The area under coconut and arecanut increased during the period 1960-'61 to 1970-71, but thereafter it decreased as is clear from Table 2.4. The total cropped area increased from 196842 ha in 1960-'61 to 233986 ha in 1977-'78.

Production and productivity of crops

Production and productivity of important crops in Trichur is shown in Table 2.5 and 2.6 respectively. The table shows that the production of rice, pepper, arecanut, banana, tapioca, coconut, rubber and tea increased during the period 1960-'61 to 1979-'80, while, the production of pulses and cashewnut declined considerably. So also, except banana, tapioca, arecanut and rubber, all other crops registered a reduction in productivity over the period.

Institutional finance

The Trichur District Co-operative Bank Limited makes credit available to the agriculturists through constituent primary service co-operative societies. There were 185 such societies in the district in 1978 with a membership of 2.93 lakhs. They disbursed loans amounting to Rs.921.46 lakhs during 1977-78.

Two primary Land Mortgage Banks operate in Trichur and they disbursed loan amounting to Rs.55.07 lakhs for land development, land reclamation, kayal reclamation and coconut cultivation during 1977-'78.

At the end of March, 1979 there were 257 bank branches in the district, of which 147 were in rural areas. The increase in commercial bank branches in Trichur was 132% over

the period 1969-79. The corresponding increase in deposits was 538%. However, the credit deposit ratio has been steadily declining as shown by Table 2.7.

The Lead Bank Scheme was launched in the district in 1969 and Canara Bank was entrusted with the responsibilities of the Lead Bank. Progress in the implementation of the credit plan prepared by the bank, till the end of 1978 is shown in Table 2.8. Overall assessment shows over-achievement of targets, eventhough there was shortfall in respect of agriculture.

The present study covers five bank branches of the Lead Bank, viz., Guruvayoor, Cherpu, Pazhanji, Irinjalakuda and Wadackancherry in Trichur district. The areas included are shown in Fig.I.

Fig. 1 - TRICHUR DISTRICT

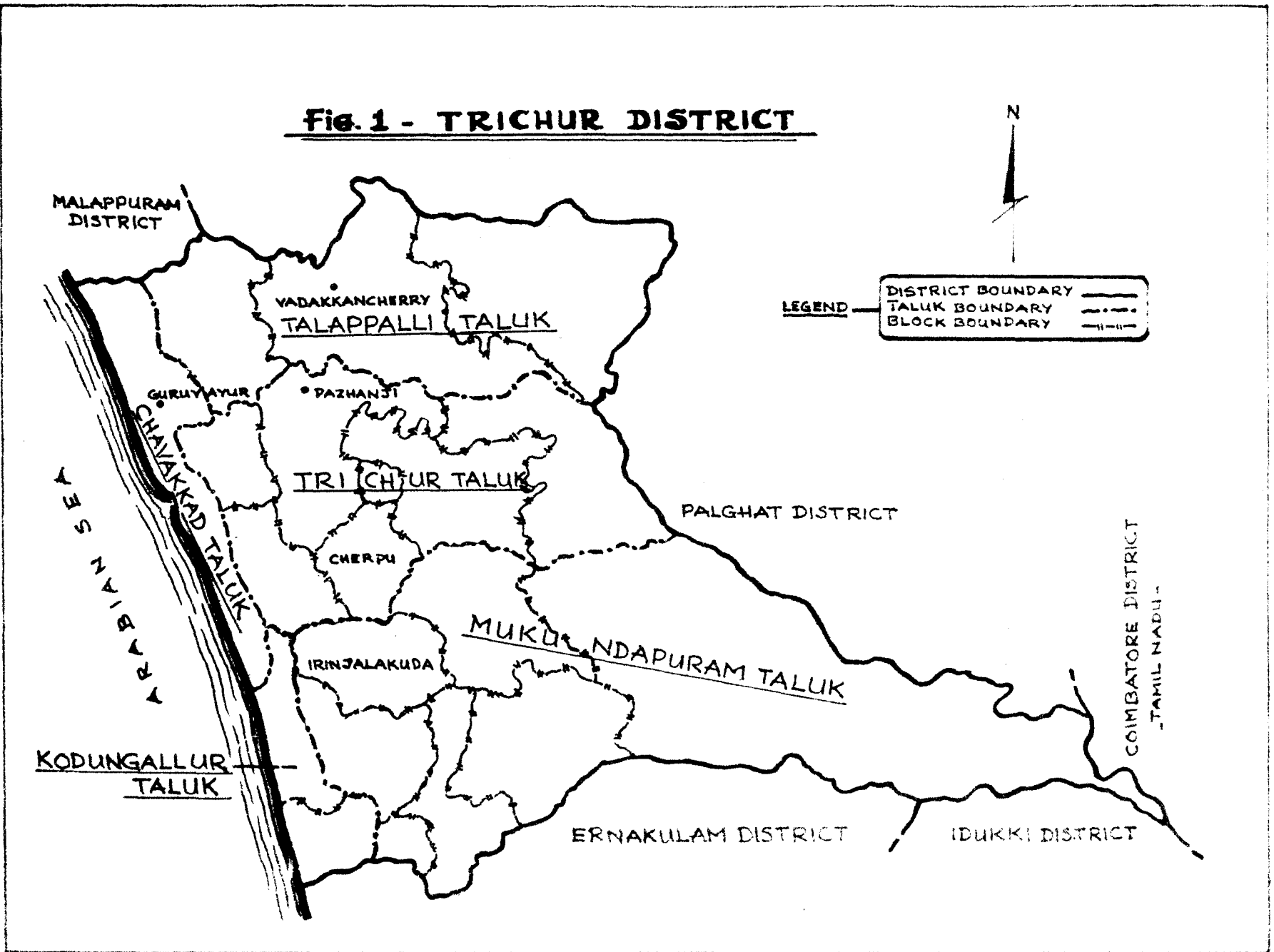


Table 2.1. Monthly rainfall in Trichur District -
Normal rainfall for Trichur and Kerala (in mm)

Months	Trichur 1980-'81	Average during 1901-'50	
		Trichur	State
January	Nil	9.3	17.5
February	Nil	8.8	17.3
March	Nil	28.6	41.4
April	84.0	86.6	109.3
May	103.0	274.3	238.2
June	1107.6	803.4	676.1
July	1255.9	761.4	702.9
August	716.0	458.6	426.3
September	261.2	250.3	238.2
October	447.1	307.5	301.7
November	239.0	158.3	184.6
December	2.0	30.3	49.3
	4215.8	3177.4	3003.8

Source: Farm Guide, 1982

Table 2.2. Crop-wise irrigated area in Trichur
1977-'78

Sl. No.	Crop	Area in ha
1	Paddy	46388
2	Vegetables	584
3	Tubers	118
4	Coconut	20808
5	Arecanut	5298
6	Banana	438
7	Betel leaves	53
8	Sugarcane	--
9	Others	1623
	Total	75310

Source: Farm Guide, 1980

Table 2.3. Land use pattern in Trichur district
1979-80

Sl. No.	Category	Area in hectares
1	Total geographical area according to village papers	299390 (100)
2	Forests	103619 (34.61)
3	Land put to non-agricultural purposes	21365 (7.13)
4	Barren and uncultivable land	2269 (0.76)
5	Permanent pastures and other grezing land	225 (0.08)
6	Land under miscellaneous tree crops	1431 (0.48)
7	Cultivable waste	5141 (1.72)
8	Fallow land other than current fallows	3112 (1.04)
9	Current fallows	4310 (1.44)
10	Net area sown	157918 (52.74)
11	Area sown more than once	79177 (26.45)
12	Total cropped area	237095 (79.19)

(Figures in parentheses are percentages to total)

Source: Trichur District Annual Plan, 1981-'82.

Table 2.4. Area under principal crops in Trichur District
1960-1978 (Area in ha)

Sl. No.	Crops	1960-61	1970-71	1977-78
Food crops				
1	Rice	102197 (51.92)	115267 (46.91)	119768 (51.19)
2	Ragi	1237 (0.63)	1212 (0.49)	43 (0.02)
3	Pulses	6964 (3.54)	7647 (3.24)	3215 (1.37)
4	Pepper	692 (0.35)	745 (0.30)	3116 (1.33)
5	Ginger	80 (0.04)	70 (0.03)	155 (0.07)
6	Turmeric	41 (0.02)	..	106 (0.05)
7	Arecanut	4141 (2.10)	13261 (5.40)	7694 (3.29)
8	Banana and other plantains	2810 (1.43)	5664 (2.30)	5388 (2.30)
9	Mango	4911 (2.49)	4968 (2.02)	4837 (2.07)
10	Cashewnut	8883 (4.51)	8056 (3.28)	6140 (2.62)
11	Tapioca	7632 (3.38)	8262 (3.36)	7610 (3.25)
12	Sweet potato	85 (0.04)	129 (0.05)	29 (0.01)
13	Other food crops	8071 (4.10)	7777 (3.17)	13288 (5.68)
	Total food crops	149284(75.84)	175082(71.25)	171389(73.25)
Non-food crops				
14	Sesamum	1163 (0.59)	1160 (0.47)	1706 (0.73)
15	Coconut	35977 (18.28)	54867 (22.33)	49641 (21.22)
16	Cotton	465 (0.24)
17	Rubber	6260 (3.18)	8402 (3.42)	8947 (3.82)
18	Tea	402 (0.20)	459 (0.18)	438 (0.19)
19	Other non-food crops	3285 (1.67)	5766 (2.35)	1865 (0.80)
	Total non-food crops	47558 (24.16)	70659 (28.75)	62597 (26.75)
	Total cropped area	196842 (100)	245741 (100)	233986 (100)

(Figures in parenthesis are percentages to total)

Source: Status Paper - Trichur District,
District Information Office.

Table 2.5. Production of important crops in Trichur district - 1960-61 to 1979-80

Sl. No.	Crops	1960-61	1970-71	1979-80	Unit
1	Rice	126110	163397	154508	Tonnes
2	Ragi	1410	1097	53	Tonnes
3	Pulses	3429	2968	2327	Tonnes
4	Pepper	295	589	552	Tonnes
5	Ginger	145	58	198	Tonnes
6	Turmeric	37	..	185	Tonnes
7	Arecanut	591	1973	1447	Million nuts
8	Banana and other plantains	20317	42805	30662	Tonnes
9	Cashewnut	13844	9039	1903	Tonnes
10	Tapioca	53030	120956	91754	Tonnes
11	Sesamum	327	556	416	Tonnes
12	Coconut	231	347	326	Million nuts
13	Cotton	640	Balanced 180 kg
14	Rubber	2394	5152	6158	Tonnes
15	Tea	683	829	995	Tonnes

Source: 1. Data for 1960-61 and 1970-71 are from Status Paper - Trichur district, District Information Centre

2. Data for 1979-80 are from Farm Guide, 1982.

Table 2.6. Productivity of crops in Trichur 1960-'61 to 1977-'78

Sl. No.	Crops	Unit	1960-61	1970-71	1977-78	Kerala 1977-78
1	Rice	kg/ha	1234	1418	1204	1541
2	Ragi	kg/ha	1140	906	1186	799
3	Pulses	kg/ha	383	373	326	451
4	Pepper	kg/ha	426	791	217	199
5	Ginger	kg/ha	1813	763	1000	2534
6	Turmeric	kg/ha	902	..	802	965
7	Arecanut	Nos.	142719	148782	204575	168965
8	Banana and other plantains	kg/ha	7232	7557	11595	12280
9	Cashewnut	kg/ha	1558	1122	591	667
10	Tapioca	kg/ha	6951	14640	18320	14457
11	Sesamum	kg/ha	281	479	272	253
12	Coconut	Nos.	6421	6325	6265	4533
13	Cotton	kg/ha	248
14	Tea	kg/ha	1701	1806	2217	1440
15	Rubber	kg/ha	383	613	685	640

Source: Status Papers - Trichur district - District Information Office

Table 2.7. Development of Banking facilities in Trichur District

Sl. No.		1969	1972	1976	December 1977	September 1978	September 1979
1	Number of branches	108	133	193	246	255	257
2	Population coverage per branch	19000	-	11030	-	8000	8000
3	Total deposits	2233	2690	6370	9913	11148	14267
4	Total advances	924	1281	2760	3413	3881	3394
5	Credit:deposit ratio	41.34	47.62	43.33	34.40	34.80	37.80

Source: Canara Bank Divisional Office, Trichur

Table 2.8. Progress in the implementation of the Trichur District credit plan for the period ended December 1978 (Rs. in lakhs)

Schemes	Credit plan outlay till December 1978	Achievements till December 1978
A. Agriculture	1807.15	1614.33
1. Crop loans	1012.67	1011.54
2. Rubber cultivation	34.00	283.01
3. Pumpsets	170.71	101.92
4. Land development	245.29	50.75
5. Farm mechanization	57.45	9.73
6. Coconut rejuvenation	63.78	58.53
7. Dairy	92.40	87.01
8. Goat rearing	20.86	7.62
9. Poultry and piggery	20.52	0.79
10. Gobar gas plants	6.17	0.78
11. Fisheries	83.00	2.65
B. Industries	435.15	381.89
1. Small scale industries	331.20	334.57
2. Handlooms	26.95	36.02
3. Cottage industries	77.00	11.30
C. Tertiary sector	406.33	1424.81
1. Coir workers	33.33	12.41
2. Road transport operators	102.90	203.01
3. Retail trade	134.45	431.50
4. Professionals and self employed	69.25	137.38
5. Others	66.40	640.51
Total	2648.63	3421.03

Source: Divisional Office, Canara Bank, Trichur.

Review of Literature

REVIEW OF LITERATURE

Research work in the field of bank finance for agriculture is scanty since the entry of commercial banks into the field of agricultural finance is rather recent. Studies regarding the impact of bank finance for minor irrigation are scantier still. However, some studies have been done in the past few years and the relevant information is presented below in the following order (a) Credit needs in farming, (b) Impact of bank finance for agriculture on cropping pattern, yield, income and employment, (c) economic feasibility and repayment capacity of loans and (d) Impact of irrigation on cropping pattern, yield, income and employment levels.

Credit needs in farming

Agricultural credit may be defined as the amount of funds made available in the hands of the farmers to meet the farm and home expenses and which will be repaid with interest later on (Emmanual, 1969). Rajagopalan (1969) defined agricultural credit as the amount of investible funds made available for the purpose of development and sustenance of productivity. According to World Bank, 1975, "Credit is often a key element in the modernization of agriculture. Not only can credit remove a financial constraint, but it may

accelerate the adoption of new technologies. Credit facilities are also an integral part of the process of commercialization of the rural economy".

A pilot study conducted by Bhargava and Shah (1967) in the Tarai region of U.P. revealed that the credit needs of small farmers consisted of credit for fertilizer, hired labour expenses, pumpset, land improvement and buildings. They identified the potential area for commercial bank finance as the provision of loans for installation of pumpsets to which the farmers gave highest priority.

Choudhury et al. (1967) in a research paper said that farmers needed seasonal credit for meeting various input requirements like seeds, fertilizers, hired labour etc. medium term loan for buying tractor, irrigation, seed drill etc. and long term loans for land improvement, irrigation channel, constructing godowns and so on. Empirical evidence in this paper showed that 92 per cent farmers needed seasonal credit and 16 per cent needed long term credit. The percentage of farmers requiring medium term credit for installing tube-wells, purchasing pumpsets, tractors and implements was 86, 8 and 39 respectively.

Dinesh (1970) through purposewise classification of advances of Bank of Maharashtra showed that most of their loans were advanced either for tractors or for oil engines

and pumpsets. This meant that the farmers going to commercial banks were not only big farmers, but also technologically oriented.

Singh et al. (1971) and Singh and Jha (1971) identified the inadequate availability of capital as a major cause for low productivity and slow adoption of technology on a majority of Indian farms.

Singh and Kahlon (1971) and Sharma and Prasad (1971) observed that the inadequacy of credit to supplement own resources was one of the most important constraints on Indian farms.

According to the All India Rural Credit Review Committee 1951-52, the annual borrowings of farmers were Rs.750/- crores. Ten years later in 1961-62, the Reserve Bank of India's Rural Debt and Investment Survey estimated the need for credit at Rs.1034 crores. The Fertilizer Credit Committee (1969) had found the credit needs of the farmers for fertilizers alone at Rs.520 crores in 1970-'71. The All India Rural Credit Review Committee estimated the short term credit needs of the farmers for 1973-74 to be Rs.2000 crores, while the medium term credit need was put up at Rs.500 crores. The long term loan requirement was estimated to be Rs.1500 crores. The sub group on agricultural credit appointed by the Working Group on Co-operation for the fifth plan (1978-79) estimated the production credit needs to be Rs.3000 crores. The

National Commission on Agriculture estimated the total farm credit at Rs.9400 crores in 1985 (Nakkiran, 1972).

Agarwal and Kumawat (1974) observed that the rapid technological transformation undergone by Indian agriculture during the post-green revolution period had resulted in increased capital needs for the farmers, which could not be met from the farmer's own funds as the pre-adoption incomes were barely sufficient to provide the minimum necessities of life.

Desai (1978) found that banks were confining their lending activities mostly to short-term requirements, and credit needs of the farmers had been enhancing steadily due to increasing doses of inputs and their prices.

Dhawan and Kahlon (1978) conducted a study on the adequacy and productivity of credit on the small farms in the Punjab. They pointed out that the credit requirements of the farm households increased by 278% over their owned capital owing to higher cash requirements of improved varieties of crops. The need to purchase irrigation facilities further raised the credit requirement by three fold.

Ram et al. (1978) studied the role of commercial banks in generation of income and savings on farms and concluded that income and savings generated on account of bank credit, could be further stepped up by supplying adequate bank credit

in time and providing proper guidance for its utilization.

Sarma and Prasad (1978) while studying the role of various economic factors in determining the demand for credit, inferred that irrigation had a significant role in augmenting credit needs.

Prasad and Singh (1981) observed that the small farmers had higher credit needs for crop production as well as for the farm as a whole, when all economic activities were taken into account.

Impact of bank finance for agriculture

An evaluation study done by the Economics Research Department of the Syndicate Bank Limited, Manipal in 1966, revealed that the installation of pumpsets had brought about a rapid transformation of the farm economy. The pumpset loans imparted an element of certainty to farm operations and also augmented the total earnings of the farm households. The repaying capacity was also enhanced (Thingalaya, 1968).

Risvi (1970) studied the role of institutional finance for development of minor irrigation. He found that the slow progress in the development was due to inadequacy of financial arrangements to meet the growing credit needs of the farmers. He recommended differential repayment periods for well-to-do farmers and small farmers.

The Department of Economics and Statistics of Bank of India conducted a case study of bank finance in Sholapur district in 1974. The study revealed an increase in cropping intensity and per acre net income of the borrowers. The increase in income was higher in case of small farmers than in medium and large farmers. However, it was noted that crop loans were sometimes diverted for unproductive purposes, thus making timely repayment difficult.

Another study conducted by the Economics and Statistics Department of Bank of India in 1977 revealed that investment in well irrigation gave the farmers greater capacity to stand the adverse effects of drought. It enabled them to adopt a remunerative cropping pattern, improved cultural practices and an intensive utilization of agricultural inputs. Savings were low; even though there was increase in net farm income.

In yet another study conducted by Bank of India in 1978 in Ujjain, it was found that farmers could irrigate 3-6 acres from new wells, 2-4 acres from old wells and 3-5 acres from installation of pumpsets. Cropping intensity increased from 90%-122% and there was a shift in cropping pattern in favour of high value crops as a result of improved irrigation. The value of additional output realized from improved irrigation facilities was estimated to be Rs.978 lakhs at 1977-'78 prices.

Yet another study conducted by the Economics and Statistics Department of Bank of India in 1978 on the rehabilitation programme of agricultural labourers revealed that the recovery position of bank finance was satisfactory due to the linking of marketing with repayment.

The evaluation reports of the Small Farmers Development Agency, Cannanore (1973) and Quilon (1980) reported incremental benefits to beneficiaries of SFDA - small and marginal farmers from minor irrigation.

Chawla et al. (1978) studied the impact of loan advances on gross income of borrower and found out that the gross income per acre increased by 62.69% in case of tube-well loans.

Singh et al. (1978) analyzed the impact of bank credit on cropping pattern, farm income and employment. They observed that borrower-farmers devoted more area to high value crops. The borrower farmers could increase their area under irrigation leading to an increase in cropping intensity, levels of income and employment in comparison to non-borrowers.

Balishter and Singh (1980) studied the impact of bank finance on cropping pattern and farm income. The study showed that the investment in tube-wells enabled the borrowers to raise their cropping intensity. There was a shift in cropping pattern in favour of high value crops and also an increase in

productivity of crops as a result of which the farmer could get incremental farm income.

Reddy (1980) studied the role of commercial banks in agricultural finance in Anantapur district, A.P. He found that at times the wells failed the farmers. The study showed that small and marginal farmers who qualify for the loans do not avail of them because of risk involved in creating the asset. He suggested that the banks consider land productivity and possible changes in cropping pattern in assessing credit worthiness apart from security norms.

Department of Agricultural Economics, Kerala Agricultural University conducted an evaluation of SFDA in Trichur district in 1981. A good deal of mismatch between horsepower of pumpsets and area irrigated was noticed in this study. There was no significant change in cropping pattern but there was significant change in the relative importance of various crops in the cropping pattern. There was an increase in cropping intensity and hence an increase in employment of labour. There was significant increase in productivity of crops and hence an increase in gross farm income.

Mishra et al. (1981) studied the effect of minor irrigation on employment pattern, and recovery position of farmers financed by State Bank of India in Madhya Pradesh.

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The loans had generated additional employment on the farm. The change in family labour days engaged on farm was highest in case of borrowers for new wells, followed by those for diesel and electric pumpsets. The change in hired labour days was highest in the case of tube well farms followed by sprinkler, electric and diesel pumpsets and new wells. The repayment of loans was also higher in the tube well case.

Umarasiya and Arora (1981) studied the impact of pumpset loans on the farm economy and concluded that the loans put the farmers on a higher technological plane. The cropping pattern changed in favour of high yielding variety of crops and there was significant increase in the yield of crops. The overall productivity of resources also improved and employment potential was also increased by 25%.

Mishra et al. (1982) studied the impact of agricultural finance on farm income and employment pattern in Jabalpur district. They found out that the change in net farm income for borrowers who took loans were highest in the case of medium size group followed by large and small size groups. The change in net farm income was due to the increase in cropping intensity and ultimately the yield. With regard to employment, there was no change in family labour utilization in the farms in all size groups. Hired labour utilization increased and the increase was highest in small size groups followed by medium and then large size groups.

Economic feasibility and repayment capacity

Jakhade-Gadgil (1970) analyzed the economic feasibility and repayment capacity of borrowers financed by co-operatives and commercial banks. They found that investment in wells alone and in pumpsets alone were feasible only in 2 out of 5 districts considered. Joint investment in wells and pumpsets was feasible in 3 districts out of five. With regard to repayment capacity only one district passed the test in the case of wells alone, all passed in the case of pumpset loans and four in the case of joint investments.

Samuel Paul (1971) reworked the feasibility of combined investment in wells and pumpsets after introducing some changes in the analysis of Jakhade-Gadgil. He found all the investments to be feasible.

Siddappa and Radhakrishnan (1977) assessed the economic feasibility and repayment capacity with the same data used by Jakhade-Gadgil with modified formulae and found that investment in wells alone was feasible only in two districts out of five and investment on pumpsets as well as joint investments were feasible in all districts. Farmers in all the districts passed the test of repayment capacity also in the case of investment in wells alone and in joint investment. But with regard to wells alone, farmers in two districts did not pass the test.

Jayaraman (1978) in his study on overdues of primary agricultural co-operative societies, confirmed the commonly held notion that irrigation facility enables the cultivator to augment gross earnings from his land and consequently increase his capacity to repay his debt instalment and interest charges in time.

Impact of irrigation

Mann (1958) studied the economic results and possibilities of irrigation. He noticed a doubling of income from irrigated crops.

Panse (1959) observed that irrigation could be used as a positive measure for increasing yield and income from rice lands.

Anand (1960) studied the various aspects of the pattern of utilizing the irrigation potential in Chambal valley. He found that the area under food crops was replaced considerably by non-food crops, generally commercial crops like vegetables, sugarcane, spices and fruits wherever there was supplemental irrigation facilities. He found that on an average the cropping intensity increased from 90-105% to 130-180%.

Rao (1963) analyzed the influence of irrigation on cropping intensity in different states of India. He found that perennial hydrological sources of irrigation as provided by wells had promoted multiple cropping and increased cropping intensity.

Shah (1963) studied cropping pattern in relation to irrigation. He observed a shift in cropping pattern with reference to the replacement of food by non-food crops, inferior by superior crops and commercial crops which led to greater monetization of agriculture through increased use and productivity of available resources.

Yeshwanath (1965) found that cropping intensity had increased consequent to the availability of well water in Ramanathapuram district. Two or more crops were grown where one used to be grown.

Desai and Thingalaya (1965) studied the yield variability in rice growing districts in India due to irrigation factor. He calculated the yield variability to be 42% due to the influence of irrigation facilities available.

Rao (1966) found a shift towards cultivation of commercial crops from food crops in well irrigated areas of Madras state.

Srivastava and George (1977) worked out the impact of lift irrigation by comparing the conditions of farmers under the operating schemes in 1974 with those under construction in 1977. Increase in crop intensity and change in cropping pattern in favour of high value crops were noticed. The farmers under the operating lifts used 40% of the cost of inputs for biological inputs while this was nil in benchmark. So also all the households in the former category was above the poverty line due to a higher per household income.

Aulakh et al. (1978) conducted a study about the dynamics of cropping pattern in hilly areas of Jammu and Kashmir. They found the land use pattern in Jammu and Kashmir to be rather stagnant, but there was an increase in cropping intensity which could be explained by an increase in the proportion of net area irrigated to the net sown area.

Singh (1978) worked out the economics of irrigation in Surendranagar. He found out that through crop-mix manipulations irrigation investment in the region turned out to be profitable except on large farms where the returns per acre per annum failed to meet the cost of irrigation supplies.

Chauhan et al. (1978) who studied the impact of lift irrigation project on cropping pattern, levels of investment and income on farm concluded that the lift irrigation project led to an increase in area under high yielding variety crops and the intensity of cropping, which in turn resulted in an increase in yield and income on the farm.

Dhawan and Kahlon (1978) conducted an evaluation of the irrigation projects on the small farms of Punjab and concluded that owned irrigation resources generated sufficient income, cropped the whole area, created more employment and minimised the risk on small holdings, thus making them viable units.

Garg et al. (1978) while studying the shifts in cropping pattern in hill regions of U.P. observed a shift in cropping pattern in favour of more remunerative crops like wheat, rice, maize, sugarcane and potato with the development of irrigational resources and increased use of fertilizers.

Nadkarni and Ghosh (1978) generalized through regression analysis that excess rainfall need not necessarily be welcome for crops. But they could not arrive at any conclusive results as to the impact of irrigation on crop yields.

Sadeghi (1978) used the Cobb-Douglas production function to estimate the production coefficients of rice before and after an increase in irrigation water supply to small farms and concluded that the amount of water available for irrigation is one of the major determinants of the optimum size for rice production.

Sinha (1978) studied the impact of lift irrigation on cropping pattern and found that there was no significant change in cropping pattern due to lift irrigation in the areas under study. Increase in cropping intensity and crop yields was noted, but was not impressive. He suggested better diffusion of knowledge to realise better results.

Sisodia (1978) found that higher use of inputs and water resulted in higher yields per acre of all the crops in

Chambal command area. There was a shift from low value crops to high value crops.

Bagi (1980) analysed farm level data in Haryana and concluded that irrigation will affect the technical and allocative efficiencies of the farms. Irrigation reduced the risk and uncertainty of crop production and encouraged more intensive use of inputs. Irrigation made multiple cropping and production of high value crops possible. Agricultural production was also made more responsive to relative price changes.

Natarajan (1980) carried out an appraisal of the minor irrigation under W.V.D.P. and found out that the implementation of the programme gave rise to a higher intensity of cropping, changes in cropping pattern, changes in the gross irrigated area, increase in annual income and employment, particularly of the weaker sections. However, failure of power supply, steep increase in oil price and strains in the management of community wells had some adverse effects on the programme.

Patel (1981) worked out the employment impact of irrigation in the Command areas of medium irrigation projects in Gujarat. He concluded that the employment per unit of land increases as a result of irrigation leading to ultimate increase in overall employment of labour in irrigated farms.

This in turn was due to an increase in the cropping intensity and also in intensity of input use.

Study conducted by Bagi in 1981 revealed that technical efficiency was higher on irrigated farms. The study also showed that irrigated farms underutilized all inputs, except labour. The output per hectare was also found to be much higher in irrigated farms.

Methodology

METHODOLOGY

The present study attempts to analyse the impact of bank finance for minor irrigation in Trichur district through a farm level investigation of borrower. It may be mentioned at the outset that it is not possible to estimate precisely the contribution of bank finance to production and income of farmers since bank finance influence these variables via its influence on cropping pattern, crop intensity and productivity. So also a number of factors other than irrigation influence crop yields and thereby income. Hence it would neither be feasible to determine the exact contribution of bank finance to the production and income of beneficiaries, nor would it be correct to attribute the entire increase in borrower's net income to bank finance. Therefore, what is proposed in the present study is to indicate the nature and extent of benefits realised by farmers after availing of bank finance. This is attempted through micro level investigation of a few beneficiaries.

Sampling procedure

The sample used for the study consisted of one hundred beneficiaries of the lead bank in Trichur, viz., The Canara Bank of finance for minor irrigation. The sample was obtained in two stages - (1) the branches of Canara Bank and

(2) the beneficiaries of the selected branches. Simple random sampling was adopted at both stages.

Five rural branches of the Canara Bank in Trichur district were first selected by simple random sampling. A list of beneficiaries for minor irrigation, viz., digging of new wells, deepening of old wells and installation of pump-sets was then collected from the selected branches. It was found that the number of beneficiaries from the branches varied widely. Hence the sample of 100 beneficiaries was apportioned among the branches in proportion to the number of beneficiaries in each branch. The branches selected and the number of beneficiaries selected from each branch is shown in Table 4.1.

Table 4.1. Branches selected and the number of beneficiaries selected from each branch

1. Guruvayoor	..	1
2. Cherpu	..	8
3. Pazhanji	..	14
4. Irinjalakuda	..	24
5. Wadakkanchery	..	53
		<hr/>
Total		100
		<hr/>

Out of the hundred farmers selected, two had already disposed off their facility, even before the period of investigation and hence they were not included in analysis. Thus

ultimately the sample size got reduced to ninetyeight.

Data

Primary data were collected from the selected beneficiaries during the period March to May 1982 using a well structured schedule (see Appendix I). The method of personal interview was adopted to elicit data from the respondents. The aspects covered were, (1) General economic and social conditions of the beneficiaries, (2) Land use pattern in the periods prior to and after acquiring the facility, (3) Amount of loan sanctioned including subsidy if any, (4) Details of the pumpset acquired, (5) Extent of use of the facility acquired, (6) Sourcewise irrigated area before and after acquiring the facility, (7) Cost of cultivation and income from different crops in periods prior to and after acquiring facility and (8) Income from hiring out of water, if any.

The method adopted to find out the impact of bank finance was to compare the pre-investment and post-investment data pertaining to irrigated area, cropping pattern, cultivation practices - yield and income levels. The alternative of having a separate sample for control was not found feasible. All the respondents except three owned less than 5 acres of land. They had a mixed cropping pattern and they were not in the habit of keeping accounts for any of the crops grown. Hence they were required to recall the relevant information

from their memory. As is inevitable in such cases, perfect accuracy in the information provided by them cannot be expected. However, every effort was made to minimise inaccuracies, through cross-questioning, cross-checking etc.

Tools of analysis

For the purpose of analysis the respondent farmers were classified into three groups on the basis of land owned by the households.

The classes were:-

1. Class I - Owning land upto 40 ares
2. Class II - Owning land between 40 ares and 100 ares
3. Class III - Owning more than 100 ares

Statistical analysis was done separately for each class so as to facilitate comparison.

1. Characteristics of the borrower farmers

The farmers in each area of study were classified according to caste, occupation, income and literacy and the data were presented in the form of tables. To arrive at the standard of living of the beneficiaries, the percentage expenditure on different items of consumption were calculated both per household and per capita. For calculating consumption expenditure per capita, the annual family expenditure was divided by the number of adult units in the family.

2. Improvements in farming practices after irrigation

The pattern of land utilization, cropping intensity

and cropping pattern and input use during the year immediately preceding the year of obtaining bank loan and during the year preceding the investigation were found out. 'Paired t test' was used for testing significance of change in cropping intensity and cropping pattern.

The cost of cultivation per hectare of the main crops viz., paddy, coconut, arecanut and banana were worked out input-wise for the above two periods. The data pertaining to the two periods were then compared to find out the changes, if any, in farming practices viz., seeds, application of manures and fertilizers, plant protection, irrigation, labour use pattern, etc.

3. Changes in crop output and yield rates

The data on production per farm and productivity per hectare of paddy, coconut, arecanut and banana were worked out for the two periods mentioned above. The data were then compared to find out the change in production and productivity and the change was expressed in percentage.

4. Impact of irrigation on farm employment and income

Human labour - hired as well as family labour, bullock labour - owned and hired and machinery used per farm and per hectare for an year were worked out for the two periods. The data were then compared to find out the changes, if any in

employment pattern due to irrigation development. Paired t test was used for testing significance in the change.

The net farm income, farm business income and family labour income before and after acquiring facility were found out and compared to arrive at the change in farm income due to irrigation.

In addition, the economic feasibility and repayment capacity of the investment concerned were also worked out.

CONCEPTS AND DEFINITIONS

1. Standard of living

Sundararajan (1978) used the term level of living as synonymous with levels of consumption which had a focus on aggregate of goods and services used, since it is difficult to quantify the non-material aspects of well being. To denote the levels of living, the percentage of expenditure spent on different items of consumption was worked out. The items included were (1) food, (2) cloth, (3) education, (4) festivals and ceremonies and (5) others (fuel, travel expenses, recreation, house rent, medicine etc.).

In the present study, to find standard of living, the percentage of expenditure on different items of consumption viz., (1) food, (2) clothing and foot wear, (3) fuel and lighting, (4) education, (5) medicine and health care,

(6) travel, (7) recreation, (8) tobacco, beedi etc. and (9) other items (social and religious occasions, festivals, etc.) were worked out per household and per adult unit.

2. Adult units

In the present study, the following standard used by Khare (1975) was used for arriving at the number of adult units in the family.

<u>Male/Female</u>	<u>Age in years</u>	<u>Consumption unit</u>
Male or female	1-5	0.50
Male or female	6-9	0.73
Male or female	10-13	0.83
Female	14 and above	0.83
Male	14 and above	1.00

Cropping pattern

Venkataramanan and Prahladachar (1980) defined an unchanging cropping pattern as a situation where the respective areas under all crops bear the same proportion to the gross cropped area over the years. They took the rate of growth in area of individual crops which differ significantly from the rate of growth of gross cropped area to be evidence of change in cropping pattern. They used the 'area' - gross cropped area elasticity, which could be defined either as the ratio of the rate of growth of area under a

crop to the rate of growth in gross cropped area, or as the ratio of the area under the crop to the gross cropped area, before and after the change to measure the shift in cropping pattern.

In the present study, cropping pattern was expressed as the percentage share of each crop in the gross cropped area. The percentage share of each crop in gross cropped area before and after acquiring the facility was calculated to find out the change in cropping pattern.

Cropping intensity

Cropping intensity is the ratio of gross cropped area to net cropped area expressed as a percentage.

$$\text{Cropping intensity} = \frac{\text{Gross cropped area}}{\text{Net cropped area}} \times 100$$

Cost of cultivation

Cost of cultivation refers to the total expenses involved in cultivating unit area of a crop.

Different people have used different cost concepts. The present study conforms to the cost concepts used in farm management studies, which is given below.

a) Cost A_1 includes

1. Value of hired human labour
2. Value of hired bullock labour
3. Value of owned bullock labour

4. Value of seeds (farm produced and purchased)
5. Value of manures and fertilizers
6. Irrigation expenditure
7. Crop protection expenditure
8. Depreciation and hiring of implements
9. Land revenue and
10. Interest on working capital

b) Cost A_2 includes Cost A_1 + rent paid for leased in land

c) Cost B includes Cost A_2 + rental value of owned land + interest on owned fixed capital.

d) Cost C includes Cost B + imputed value of family labour

This gives total cost.

Interest on working capital was calculated at 11.5% of the total paid up capital and rental value of owned land was taken as 1/5 of the value of gross produce. The kind payments towards harvesting charges were excluded from both costs and returns.

Seeds, manures, fertilizers and pesticides

Home produced seeds and manures were valued at the prevailing village prices while purchased seeds, manures, fertilizers and plant protection chemicals were valued at the actual price paid. For calculating cost of cultivation in the period prior to acquiring facility the inputs were valued

at current prices to eliminate the effect of inflation.

Irrigation charges

For working out cost of cultivation, irrigation charges included irrigation and dewatering charges paid to the Co-operative Societies for operating the community irrigation schemes. In the case of well irrigation, the actual charges paid for fuel or electricity charges were considered. Irrigation charges before acquiring facility were calculated at the rates prevailing in the current period.

Cost of production

Cost of production is the cost for producing one quintal of the produce.

Farm income

Chauhan et al. (1972) referred gross income as the value at prevailing prices of retained as well as marketed crop output and also the income from allied activities such as dairy, goats and poultry.

In the present study, gross farm income included value of crop output both main product and by-product including those used for consumption purposes, calculated at the prices prevailing during the period of investigation or the actual prices received as the case may be. Net farm income was arrived at by deducting from the gross income, costs of seeds,

hired human labour, hired bullock labour, hired machinery, manures and fertilizers, insecticides and pesticides, irrigation and fuel charges and repair and maintenance charges, i.e., cost C.

Employment

In the present study, eight hours of work per day was considered as a man day unit. For purposes of standardisation, 1 man and 2 women doing 8 hours of work each was considered as one man-day unit and this ratio was based on the wage rates prevailing in the district during the period of investigation.

Family labour

Family labour denotes actual work carried out by family members for crop production. This has been valued at the prevailing rates paid to hired labour.

Bullock labour

Four hours of work per day was considered as a bullock pair day unit. Owned bullock labour has been accounted at the rates for hired bullock labour prevailing in the locality.

Economic feasibility

Jakhade-Gadgil (1970) used the following formula for finding out the economic feasibility.

Repayment capacity

Jakhade-Gadgil defined repayment capacity as,

$$R = Y - (c+l+k): R \geq Q \text{ where}$$

R = Repayment capacity,

Y = Net farm income

c = Minimum need based level of living for a family
of 5 members

l = Pre-existing liabilities

k = Provision for possible increase in consumption
and liabilities

Q = Annual capital charge

The definition was modified by Siddappa and Radhakrishnan
(1977) as

$$R = Y_1 - (C_1^1 + L_1^1) \text{ and } R > Q'' + K''_1 \text{ where}$$

Y_1 = Family income from all sources

C_1^1 = Pre-investment household expenditure

L_1^1 = All pre-existing liabilities

Q'' = Annual capital charge for the period of the loan

K''_1 = Provision for adverse weather, contingencies in
farm and non-farm activities and replacement of
worn out farm assets.

In the present study, the following definitions were
used.

$$\Delta Y_f \geq Q + \Delta C + K \text{ where}$$

ΔY_f = increased gross farm income due to the given investment

Q = Annual capital charge

ΔC = Annual increase in cultivation expenses

K = Desired margin for improvement in level of living, adverse weather factor and cost-price relation etc.

Samuel Paul (1971) modified the definition as follows:

$$\Delta Y_f > Q' + \Delta C + K' - S \text{ where}$$

ΔY_f and ΔC are same as in Jakhade-Gadgil paper

K' = Provision for adverse weather related to gross incremental income due to unit investment.

Q' = Annual capital charge for the serviceable life of the asset.

S = Net income from sale of water or hiring out water derived from unit investment.

Siddappa and Radhakrishnan (1977) further modified the definition as follows:

$$\Delta Y_f > Q' + \Delta C + K'_1 - S \text{ where,}$$

ΔY_f = increased gross farm income due to unit investment

A', S & K'₁ same as in Samuel Paul's definition.

ΔC = Annual increase in cultivation expense after investment

Economic feasibility:

$$\Delta Y_f > Q + \Delta C - S, \text{ where}$$

ΔY_f = increased gross farm income due to unit investment

Q = annual capital charge for the serviceable life of the asset

ΔC = annual increase in cultivation expense

S = income from sale of water

Repayment capacity:

$$R = Y - (c + l) \text{ and } R > Q^1, \text{ where}$$

Y = Family income from all sources

c = Household expenditure

l = All pre-existing liabilities

Q^1 = Annual capital charge for the period of the loan

Results and Discussion

I. CHARACTERISTICS OF THE BORROWING FARMERS

This section of the study attempts to provide a background information about the general social and economic conditions of the borrower farmers.

1. Caste

Classification of the beneficiaries according to caste showed that out of 98 farmers included in the study, 33 (33.87%) belonged to Hindu forward castes and 28 to Hindu backward castes of which 5 were members of scheduled castes. Out of the rest, 27 were christians and 10 were Muslims as shown by Table 5.1.

2. Family size

The average family size for the sample worked out to 7 (6.6). The average size of family for Pazhanji and Guruvayoor was 6 persons per family whereas it was 7 persons per family in Cherpu, Irinjalakuda and Wadakkancherry. Table 5.2 shows that majority of the beneficiaries, i.e., 41 out of 98 had a family of size 3-6. Twelve respondents had very small families with 1-3 members in it and fifteen had very big families with more than 9 members.

Table 5.3 shows a distribution of the beneficiaries' family members according to sex and age. The males outnumbered the females in all the villages studied. For the sample as a whole the sex ratio was 851. This was contrary to be the sex ratio for the district as a whole which was 1081.

The working population, that is people in the age group of 15-60 was 533 i.e., 82.25% on whom the rest of the population depended for their living. The dependents included 185 (10.6%) children and 49 (7.5%) old people.

3. Literacy

Distribution of the respondents according to educational status showed 16 of them to be illiterate. Thirtyseven respondents had attended schools - nine upto fourth standard, seven upto seventh standard and twentyone upto S.S.L.C. Three beneficiaries had diplomas to their credit and 27 were graduates as shown by Table 5.4.

Table 5.5 shows the literacy of the members of the household out of a total strength of 648 people, 66 (10.18%) were children below the age of 5. Out of the remaining 582 people, 70 were illiterate, i.e., 12.03%. There were 64 graduates and 10 postgraduates among them. The literacy of the sample was 89.23%. This was far higher than the district literacy of 72.3%. This reveals that the beneficiaries were mostly literate people, who were aware of the benefits offered to them and availed of them. The literacy was higher among males in all the study areas as also for the sample as a whole.

4. Occupation

Sixtyone (62.24 per cent) respondents had farming as the only occupation as shown by Table 5.6. Twentysix beneficiaries (26.54%) were employed in some government or private firm in some capacity. Seven respondents were engaged in trade. Three respondents were engaged in professions and one was a

labourer. Table 5.7 shows the occupationwise classification of the adult members of the households in the sample. It can be seen that only 86 persons (20.62 per cent) were engaged in agriculture. Only about 42 per cent of the workforce had any regular employment. Of the rest a little over 20 per cent were students while over 37 per cent was unemployed.

Source of income

Almost 44 per cent of the households depended on non-agricultural pursuits for their major share of income. Among these non-agricultural pursuits service was the most important. It was the main source of income for 30.62% of the families. Income from 'other sources', contributed a major part of the family income in the case of eight families. This reflected the now popular phenomenon of 'Gulf Money', flowing into the State. 9.81% of the beneficiaries in Wadakkancherry, 8.33% in Irinjalakuda and 7.14% in Pazhanji had their income supplemented by earnings from abroad (see Table 5.8).

A further classification of the beneficiary households according to all their sources of income - main and subsidiary, showed that only 30.62% of the beneficiary households depended solely on agriculture for their income. All others except one beneficiary, who had labour as his only source of income, had some supplementary income in addition to income from the main source.

Agriculture and service was found to be the combination which served the maximum number of beneficiaries as revealed by Table 5.9.

The one beneficiary who had his income from labour alone, owned a piece of land in which he had planted a few coconut seedlings which had not started bearing yet. Meanwhile, the family earned their living through working in other people's fields.

Area owned

As leasing in and leasing out was not found in the sample area owned was also area operated. This area ranged from one-fifth of a hectare of land to over 2 hectares of land. They have been grouped into three classes, viz., (1) beneficiaries owning less than 40 ares of land, (2) beneficiaries with land in between 40 ares and 100 ares of land and (3) those owning more than 100 ares of land. Majority of the farmers i.e., 40 out of 98 fell into the II class with 40-100 ares of land. Thirty beneficiaries were marginal farmers with less than 40 ares of land and twentyeight beneficiaries owned more than 100 ares (Table 5.10).

Income

Table 5.11 shows the distribution of beneficiaries according to their family income from all sources including net income from agriculture. Twentyone of the beneficiaries had gross income of more than Rs.30,000/- per annum. Two of these farmers owned less than forty ares of land and obviously

their income from farming was supplemented by income from other sources also. Thirty farmers had an income of Rs.15,000/- to Rs.30,000/- and twentyone had an income of Rs.7,500/- to Rs.15,000/-. Twentysix beneficiaries had a low family income of less than Rs,7,500/- per annum and the majority of them were marginal farmers with less than forty ares of land.

The average per family income for the sample households as a whole worked out to Rs.17,922.73 per annum as shown by Table 5.12. The per adult unit income was Rs.3,387.96 per annum. The average per family income for all the size classes of beneficiaries was well above Rs.12,000/- per annum. It ranged from Rs.12,076/- in the smallest holding size to Rs.28,384/- in the largest size.

A classification of the farmers according to area owned and the income from farming (Table 5.13) showed that 32 farmers had an annual farm income less than Rs.15,000/-. Twenty-five farmers had an income between Rs.5,000/- and Rs.10,000/- and forty had income more than Rs.10,000/-.

All the marginal farmers, except one had a farm income less than Rs.10,000/-. Out of the forty farmers in Class II, 25 had less than Rs.10,000/- as their farm income. Only 4 farmers in Class III, had an annual farm income less than Rs.10,000/-. Out of the remaining twentyfour, 16 got more

than Rs.15,000/- per annum from farming. One beneficiary who depended on labour for his livelihood, had no income whatsoever from farming.

Income from farming varied widely among different size groups of beneficiaries, being less than Rs,5,000/- in Class I and Rs.19,345.39 in Class III (Table 5.12).

The above results show that the borrowing habit of the people were not much influenced by their caste, occupation or income. Even those farmers who did not have farming as their main occupation or major source of income, were seen to have availed of bank's assistance to acquire pumpsets to irrigate their land. So also, the comparatively well-off farmers who could meet the expense from their own pockets were also found to go for bank's assistance.

Standard of living

Consumption expenditure

Table 5.14 shows the commoditywise consumption of food grains in the sample households. 91.25% of the foodgrains consumed was rice. Wheat formed 5.7% of the quantity of food grains consumed per household and per adult unit 3.05% was accounted for by pulses. The consumption of wheat and pulses was low in all the size groups of beneficiaries.

The average annual consumption of food grains per annum was 9.18 quintals per household and 1.73 quintals

per adult unit for the sample as a whole. The consumption of rice was 8.38 quintals per household and 1.58 quintals per adult unit. The per adult unit consumption of wheat was 0.10 quintal per annum and that of pulses 0.05 quintal per annum.

Consumption of food grains increased with an increase in holding size, it was 8.08 quintals per household per annum in size group I and 9.76 quintals in size group III. This is partly due to an increase in the number of adult units per family in size group III and also due to the presence of servants for household chores who are to be fed by the family.

Expenditure on protective foods

The total expenditure per household on protective foods like milk, meat, sugar etc. worked out to Rs.3,568.25 for the sample as a whole. The corresponding per capita expenditure was Rs.674.53. The expenditure on protective foods, both per household and per capita increased progressively from size group I to size group III, as is shown in Table 5.15.

Grocery items including coconut was the major contributor towards total expenditure on protective foods. Milk and milk products was the second most important item contributing 22.97% of the total expenditure on protective foods. The percentage of expenditure on the various items remained almost the same in the three size groups of farmers, but

the absolute amounts spent on the items differed widely.

The total consumption expenditure, incurred per family was Rs.10,540.45 for the sample as a whole and per capita expenditure was Rs.1,992.52. Itemwise break-up of the total consumption expenditure is given in Table 5.16. It can be seen that expenditure on food as a proportion of total expenditure decreased with increase in size of holding. As income increased with holding size, it would mean that the proportion of income spent on food decreased with increase in income as postulated in Engel's Law of Family Expenditure. Next to foodgrains, clothing and foot wear was the main contributor to total consumption expenditure. For the sample as a whole, it came to Rs.1,270.10 per family (12.1%) and the amount spent on the item increased with increase in holding size. Fuel and lighting also accounted for a considerable portion of the total expenditure in all the size groups of farmers. This was probably due to the high cost of firewood on which majority of the households in rural areas depended for cooking.

The expenditure on education increased progressively with increase in holding size. The trend was the same in the case of other items like health care, recreation, expenditure on beedi, liquor, etc. However, the proportion of expenditure on these items to total expenditure remained more or less on par in all the classes. The expenditure on 'other items'

such as presents, religious and social occasions etc. also increased with increase in size of holding.

On the whole, it is evident that the farmers owning more than 100 ares of land have a higher income compared to those with less than that. They therefore enjoy a better standard of living with their comfortable income.

Analysis of the consumption patterns has shown the standard of living of beneficiaries to be well above average. It is clear that they are enterprising individuals who in an endeavour to realize better yields from their crops had sought bank finance, for the purpose of minor irrigation.

Table 5.1. Distribution of beneficiaries according to caste

Caste/ Religion	Guru- vayoor	Cherpu	Pazhanji	Irinjala- kuda	Wadakkan- cherry	Total
1. Hindu						
a) Forward	-	1 (12.5)	3 (21.42)	10 (41.67)	19 (37.25)	33 (33.67)
b) Backward	-	6 (75.0)	1 (7.14)	9 (37.5)	12 (23.53)	28 (28.57)
of which						
SC/ST	-	-	1	1	3	5
O.B.C.	-	6	-	8	9	23
c) Muslims	-	-	2 (14.3)	-	8 (15.69)	10 (10.20)
d) Christians	1	1 (12.5)	8 (57.14)	5 (20.83)	12 (23.53)	27 (27.56)
Total	1 (100)	8 (100)	14 (100)	24 (100)	51 (100)	98 (100)

Figures in parenthesis are percentages to total

Table 5.2. Distribution of beneficiaries according to family size

Size of family	Guru- vayoor	Cherpu	Pazhanji	Irinjala- kuda	Wadakkan- cherry	Total
1-3	-	1 (12.50)	2 (14.29)	3 (12.5)	6 (11.76)	12 (12.24)
3-6	1 (100)	3 (37.50)	6 (42.86)	11 (45.8)	20 (39.22)	41 (41.84)
6-9	-	1 (12.50)	5 (35.71)	7 (29.2)	17 (33.33)	30 (50.61)
Above 9	-	3 (37.50)	1 (7.14)	3 (12.5)	8 (15.69)	15 (15.31)
Average size of family	6	6.88	5.71	6.79	6.75	6.61

Figures in parenthesis are percentages to total

Table 5.3. Agewise, sexwise classification of members of the beneficiaries' household

Age in years	Guruvayoor		Cherpu		Pazhanji		Irinjalakuda		Wadakkancherry		Total	
	M	F	M	F	M	F	M	F	M	F	M	F
0-5	3 (75)	-	1 (3.57)	-	9 (18)	1 (3.33)	6 (6.82)	6 (8)	15 (8.33)	25 (15.24)	34 (9.71)	32 (10.74)
6-14	-	-	3 (10.71)	3 (11.11)	11 (22)	6 (20)	15 (17.05)	12 (16)	35 (19.45)	31 (18.90)	64 (18.29)	52 (17.45)
15-60	1 (25)	2 (100)	20 (71.43)	20 (74.08)	28 (56)	21 (70)	63 (71.58)	51 (68)	115 (63.89)	96 (58.54)	227 (64.86)	190 (63.76)
61 and above	-	-	4 (14.29)	4 (14.81)	2 (4)	2 (6.67)	4 (4.55)	6 (8)	15 (8.33)	12 (7.32)	25 (7.14)	24 (8.05)
Total	4 (100)	2 (100)	28 (100)	27 (100)	50 (100)	30 (100)	88 (100)	75 (100)	180 (100)	164 (100)	350 (100)	298 (100)

Figures in parenthesis are percentages to total

Table 5.4. Distribution of beneficiaries according to literacy of head of family

	Guru- vayoor	Cherpu	Pazhanji	Irinja- lakuda	Wadakkan- cherry	Total
Upto 4th Std.	-	1 (12.5)	-	5 (20.83)	3 (5.88)	9 (9.18)
Upto 7th Std.	-	-	1 (7.14)	2 (8.33)	4 (7.84)	7 (7.14)
Upto S.S.L.C.	-	1 (12.5)	4 (28.57)	3 (12.50)	13 (25.49)	21 (21.43)
Diploma	-	-	1 (7.14)	-	2 (3.92)	3 (3.06)
P.D.C.	1 (100)	2 (25)	2 (14.29)	3 (12.50)	2 (3.92)	10 (10.20)
Graduates	-	1 (12.5)	3 (21.43)	8 (33.33)	16 (31.37)	27 (27.55)
Post- graduates	-	-	-	2 (8.33)	2 (3.92)	4 (4.08)
Illiterates	-	3 (37.5)	3 (21.43)	1 (4.17)	9 (17.65)	16 (16.33)
Total	1 (100)	8 (100)	14 (100)	24 (100)	51 (100)	98 (100)

Figures in parentheses are percentages to total

Table 5.5. Areawise, sexwise literacy of members of the households

Literacy level	Guruvayoor		Cherpu		Pazhanji		Irinjalakuda		Wadakkancherry		Total	
	M	F	M	F	M	F	M	F	M	F	M	F
Upto 4th Std.		1 (50)	3 (11.11)	5 (18.52)	12 (29.27)	4 (13.79)	6 (7.32)	15 (21.74)	25 (15.15)	27 (19.42)	46 (14.56)	52 (19.55)
Upto 7th Std.		1 (50)	2 (7.41)	4 (14.81)	5 (12.20)	6 (20.69)	13 (15.85)	11 (15.94)	18 (10.91)	24 (17.27)	38 (12.03)	46 (17.29)
Upto S.S.L.C.			12 (44.44)	7 (25.93)	9 (21.95)	6 (20.69)	34 (41.46)	22 (31.88)	46 (27.88)	32 (23.02)	202 (31.96)	67 (25.19)
Diploma			2 (7.41)	2 (7.41)	2 (4.88)	1 (3.45)	2 (2.44)	-	2 (7.27)	4 (2.88)	18 (5.70)	7 (2.63)
P.D.C.	1 (100)	-	2 (7.41)	2 (7.41)	2 (4.88)	1 (3.45)	14 (17.07)	6 (8.70)	22 (13.33)	13 (9.35)	41 (12.97)	22 (8.27)
Graduates	-	-	2 (7.41)	3 (11.11)	10 (24.39)	2 (6.90)	8 (9.76)	6 (8.70)	20 (12.12)	13 (9.35)	40 (12.66)	24 (9.02)
Post-graduates	-	-	1 (3.70)	-	-	-	3 (3.66)	-	4 (2.42)	2 (1.44)	8 (2.53)	2 (0.75)
Illiterates	-	-	3 (11.11)	4 (14.81)	1 (2.43)	9 (31.03)	2 (2.44)	9 (13.04)	18 (10.92)	24 (17.27)	24 (7.59)	46 (17.30)
Total	1 (100)	2 (100)	27 (100)	27 (100)	41 (100)	20 (100)	82 (100)	69 (100)	165 (100)	139 (100)	316 (100)	266 (100)

Figures in parentheses are percentages to total

Table 5.6. Distribution of beneficiaries according to occupation of head of family

Occupation	Guru- vayoor	Cherpu	Pazhanji	Irinjala- kuda	Wadakkan- cherry	Total
Farming	1 (100)	8 (100)	10 (71.43)	10 (41.67)	32 (62.75)	61 (62.24)
Service	-	-	3 (21.43)	8 (33.33)	15 (29.41)	26 (26.54)
Trade	-	-	1 (7.14)	4 (16.67)	2 (3.92)	7 (7.14)
Profession	-	-	-	2 (8.33)	1 (1.96)	3 (3.06)
Labour	-	-	-	-	1 (1.96)	1 (1.02)
Total	1 (100)	8 (100)	14 (100)	24 (100)	51 (100)	98 (100)

Figures in parentheses are percentages to total

Table 5.7. Occupationwise classification of adult members of the households

Occupation	Guru- vayoor	Cherpu	Pazhanji	Irinja- lakuda	Wadakkan- cherry	Total
Farming	1 (33.33)	8 (20.0)	14 (28.57)	21 (18.42)	42 (19.91)	86 (20.62)
Service	-	5 (12.5)	8 (10.33)	16 (14.04)	36 (17.06)	65 (15.59)
Trade	-	1 (2.5)	1 (2.04)	8 (7.02)	8 (3.80)	18 (4.32)
Profession	-	-	1 (2.04)	3 (2.62)	1 (0.47)	5 (1.20)
Labour	-	1 (2.5)	-	-	2 (0.94)	3 (0.72)
Students	-	14 (35.0)	9 (18.37)	29 (25.44)	32 (15.17)	84 (20.14)
Unemployed	2 (66.67)	11 (27.5)	16 (32.65)	37 (32.46)	90 (42.65)	156 (37.41)
Total	3 (100)	40 (100)	49 (100)	114 (100)	211 (100)	417 (100)

Figures in parentheses are percentages to total

Table 5.8. Classification of respondents according to major source of income

Source of income	Guru-vayoor	Cherpu	Pazhanji	Irinja-lakuda	Wada-kkancherry	Total
Farming	1 (100)	6 (75)	9 (64.29)	11 (45.83)	28 (54.90)	55 (56.12)
Service	-	2 (25)	4 (28.57)	9 (37.51)	15 (29.41)	30 (30.62)
Trade	-	-	-	2 (8.33)	2 (3.92)	4 (4.08)
Profession	-	-	-	-	-	-
Labour	-	-	-	-	1 (1.96)	1 (1.02)
Other sources	-	-	1 (7.14)	2 (8.33)	5 (9.81)	8 (8.16)
Total	1 (100)	8 (100)	14 (100)	24 (100)	51 (100)	98 (100)

Figures in parentheses are percentages to total

Table 5.9. Distribution of beneficiaries according to all sources of income

Source of income	Guru-vayoor	Cherpu Pazhanji	Irinjala-kuda	Wadakkan-cherry	Total	
Farming alone	-	3 (37.5)	5 (35.71)	6 (25.00)	16 (31.38)	30 (30.62)
Farming and service	-	1 (12.5)	3 (21.43)	9 (37.50)	18 (35.30)	31 (31.64)
Farming and trade	-	1 (12.5)	1 (7.14)	2 (8.33)	5 (9.80)	9 (9.18)
Farming and profession	-	-	1 (7.14)	1 (4.17)	1 (1.96)	3 (3.06)
Labour alone	-	-	-	-	1 (1.96)	1 (1.02)
Farming, service and trade	-	2 (25.0)	-	3 (12.50)	2 (3.92)	7 (7.14)
Farming, trade and profession	-	-	-	1 (4.17)	1 (1.96)	2 (2.04)
Farming and other sources	1 (100)	1 (12.5)	2 (14.29)	-	5 (9.80)	9 (9.78)
Farming, trade and other sources	-	-	2 (14.29)	2 (8.33)	2 (3.92)	6 (6.12)
Total	1 (100)	8 (100)	14 (100)	24 (100)	51 (100)	98 (100)

Figures in parentheses are percentages to total

Table 5.10. Distribution of beneficiaries according to area owned

Area owned in ares	Guru-vayoor	Cherpu	Pazhanji	Irinjala-kuda	Wadakkan-cherry	Total
0-40	1 (100)	2 (25.0)	2 (14.29)	6 (25.00)	19 (37.25)	30 (30.61)
40-100	-	5 (62.5)	7 (50.00)	11 (45.83)	17 (33.33)	40 (40.82)
100	-	1 (12.5)	5 (35.71)	7 (29.17)	15 (29.42)	28 (28.57)
Total	1 (100)	8 (100)	14 (100)	24 (100)	51 (100)	98 (100)

Table 5.11. Classification of respondents - areawise and incomewise (income in Rs)

Size of farm in ares	7500	7500 to 15000	15000 to 30000	30000	Overall
0-40	15 (57.69)	8 (38.10)	5 (16.67)	2 (9.52)	30 (30.61)
40-100	9 (34.62)	9 (42.85)	13 (43.33)	9 (42.86)	40 (40.82)
100	2 (7.69)	4 (19.05)	12 (40.00)	10 (47.62)	28 (28.57)
Overall	26 (100)	21 (100)	30 (100)	21 (100)	98 (100)

Figures in parentheses are percentages to total

Table 5.12. Sourcewise income of beneficiaries (in rupees)

Source of income	Size group			Overall
	I 40 ares	II 40-100 ares	III 100 ares	
Farming:				
Per family	4366.00	9952.68	19345.39	10926.10
Per adult unit	882.02 (36.15)	1892.14 (57.07)	3387.98 (68.36)	2065.43 (57.82)
Service:				
Per family	4583.33	4315.50	6111.43	4912.14
Per adult unit	925.93 (37.95)	820.44 (24.75)	1070.30 (21.53)	928.57 (26.00)
Trade:				
Per family	286.67	1735.00	1375.00	1188.78
Per adult unit	57.91 (2.37)	329.85 (9.95)	240.81 (4.84)	224.72 (6.29)
Profession:				
Per family	-	225.00	-	91.84
Per adult unit	-	42.78 (1.29)	-	17.36 (0.49)
Labour:				
Per family	133.33	150.00	-	120.04
Per adult unit	26.94 (1.11)	28.52 (0.86)	-	19.29 (0.54)
Other sources:				
Per family	2706.67	1061.25	1444.64	1647.49
Per adult unit	546.80 (22.42)	201.76 (6.08)	253.00 (5.09)	316.54 (8.86)
Total:				
Per family	12076.00	17439.43	28276.46	17866.39
Per adult unit	2439.60 (100)	3315.59 (100)	4952.09 (100)	3571.89 (100)
Number of adult units per family	4.95	5.26	5.71	5.29

Figures in parentheses are percentages to total

Table 5.13. Classification of beneficiaries according to farm income (in rupees)

Size of farm in ares	5000	5000 to 10000	10000 to 15000	15000	Total
40	22 (68.74)	6 (24.00)	-	1 (4.35)	29 (29.90)
40-100	7 (21.88)	18 (72.00)	9 (52.94)	6 (26.08)	40 (41.23)
100	3 (9.38)	1 (4.00)	8 (47.06)	16 (69.57)	28 (28.87)
Total	32 (100)	25 (100)	17 (100)	23 (100)	97 (100)

Figures in parentheses are percentages to total

Table 5.14. Consumption of major food grains per family and per adult unit (in quintals)

Items	Class I	Class II	Class III	Overall
I. Cereals				
a. Rice per family	7.18	8.98	8.80	8.38
Per adult unit	1.45 (88.91)	1.71 (93.50)	1.54 (90.16)	1.58 (91.25)
b. Wheat				
Per family	0.64	0.39	0.60	0.52
Per adult unit	0.13 (7.87)	0.07 (4.00)	0.11 (6.15)	0.10 (5.70)
II. Total cereals:				
Per family	7.82	9.37	9.40	8.90
Per adult unit	1.58 (96.78)	1.78 (97.50)	1.65 (96.31)	1.68 (96.95)
III. Pulses:				
Per family	0.26	0.24	0.36	0.28
Per adult unit	0.05 (3.22)	0.05 (2.50)	0.06 (3.69)	0.05 (3.05)
Total food grains:				
Per family	8.08	9.61	9.76	9.18
Per adult unit	1.63 (100)	1.83 (100)	1.71 (100)	1.73 (100)
Average number of adult units per family				
	4.95	5.26	5.71	5.29

Figures in parentheses are percentages to total

Table 5.15. Constituents of expenditure on protective foods per year (in rupees)

Sl. No.	Items	Class I	Class II	Class III	Overall
1	Sugar:				
	Per family	118.80	146.25	194.14	151.53
	Per adult unit	24.00 (4.91)	27.80 (3.81)	34.06 (4.50)	28.64 (4.25)
2	Milk and milk products:				
	Per family	525.84	829.07	1033.67	794.70
	Per adult unit	106.23 (21.72)	157.62 (21.17)	181.35 (24.05)	178.87 (22.27)
3	Edible oils:				
	Per family	209.00	285.30	351.00	280.71
	Per adult unit	42.22 (8.63)	54.24 (7.28)	61.58 (8.15)	53.07 (7.87)
4	Fruits and vegetables:				
	Per family	256.03	312.54	326.00	462.35
	Per adult unit	51.72 (10.57)	135.46 (18.19)	57.19 (7.57)	87.40 (12.96)
5	Meat:				
	Per family	202.25	314.15	352.29	315.29
	Per adult unit	40.86 (8.35)	71.13 (9.50)	61.80 (8.18)	59.60 (8.84)
6	Fish:				
	Per family	259.68	502.81	630.77	469.40
	Per adult unit	52.46 (10.72)	95.59 (12.84)	110.66 (14.66)	87.89 (13.13)
7	Egg:				
	Per family	91.27	100.00	165.06	115.92
	Per adult unit	18.44 (3.77)	19.01 (2.55)	28.96 (3.83)	21.91 (3.24)
8	Grocery items:				
	Per family	758.73	965.53	1247.57	982.80
	Per adult unit	153.28 (31.33)	183.56 (24.66)	218.87 (29.06)	185.76 (27.44)
	Total:				
	Per family	2421.62	3915.65	4300.50	3568.25
	Per adult unit	489.21 (100)	744.41 (100)	754.47 (100)	674.53 (100)

Figures in parentheses are percentages to total

Table 5.16. Constituents of family expenditure per year in different size groups of holdings (in rupees)

Sl. No.	Items	Class I	Class II	Class III	Overall
1	Cereals:				
	Per family	2571.60	3073.40	2994.21	2897.16
	Per adult unit	519.52 (33.90)	584.30 (27.20)	524.38 (23.72)	547.67 (27.49)
2	Pulses:				
	Per family	143.00	132.45	192.43	152.82
	Per adult unit	28.89 (1.88)	25.18 (1.17)	33.70 (1.52)	28.89 (1.45)
3	Protective foods:				
	Per family	2421.62	3915.65	4300.50	3568.25
	Per adult unit	489.21 (31.79)	744.41 (34.66)	754.47 (34.07)	674.53 (33.80)
4	Total food:				
	Per family	5136.22	7121.50	7487.14	6618.23
	Per adult unit	1037.62 (67.57)	1353.90 (63.03)	1311.23 (59.31)	1251.08 (62.74)
5	Clothing and foot wear:				
	Per family	678.00	1395.75	1725.00	1270.10
	Per adult unit	136.97 (8.94)	265.35 (12.35)	302.10 (13.66)	240.09 (12.10)
6	Fuel and lighting:				
	Per family	677.00	793.98	915.66	792.94
	Per adult unit	136.77 (8.92)	150.95 (7.03)	160.36 (7.25)	149.89 (7.50)
7	Education:				
	Per family	279.33	567.38	768.21	536.58
	Per adult unit	56.43 (3.71)	107.87 (5.02)	134.54 (6.09)	101.43 (5.10)
8	Medicine and health care:				
	Per family	82.00	289.00	338.57	239.80
	Per adult unit	16.57 (1.08)	54.94 (2.59)	59.29 (2.68)	45.33 (2.30)

Table 5.16. continued

Sl. No.	Items	Class I	Class II	Class III	Overall
9	Travelling:				
	Per family	406.80	529.58	695.53	539.41
	Per adult unit	82.18 (5.46)	100.68 (4.69)	121.81 (5.51)	101.97 (5.12)
10	Recreation:				
	Per family	91.00	269.13	305.25	224.92
	Per adult unit	18.38 (1.21)	51.17 (2.38)	53.46 (2.42)	42.52 (2.13)
11	Tobacco/beedi/ liquor:				
	Per family	155.44	161.32	252.30	185.51
	Per adult unit	31.40 (2.05)	30.67 (1.43)	44.19 (2.00)	35.07 (1.76)
12	Other items:				
	Per family	80.50	109.75	136.61	132.96
	Per adult unit	16.26 (1.06)	32.27 (1.46)	23.92 (1.08)	25.13 (1.26)
	Total:				
	Per family	7586.29	11297.39	12624.27	10540.45
	Per adult unit	1542.58 (100)	2147.79 (100)	2210.91 (100)	1992.52 (100)
	Average number of adult units per family	4.95	5.26	5.71	5.29

Figures in parentheses are percentages to total

II. USE OF THE BANK FINANCE

Among the various horse power engines, the largest number of pumpsets acquired through bank's assistance was of 3 HP, as shown in Table 5.17. Out of the 98 pumpsets acquired, 52 were 3 HP pumpsets and 38 were 1.5 HP. Only 24 pumpsets were run by diesel, the rest being electrically operated. Electricity was much cheaper than diesel; on an average the former costs only Rs.1.46 per hour, while the latter costs Rs.3.08 per hour. The average cost of fuel per pumpset worked out to Rs.2.65 per hour, as shown in Table 5.20.

The average cost of a pumpset for the beneficiaries as a whole, worked out to Rs.2776.76, out of which Rs.591.06 was subsidy and Rs.2185.70 was the loan. Subsidy was highest in Group I and the loan was highest in group III. The cost of a pumpset came to Rs.3398.05 in size group III, but it was only Rs.2568.23 in size group I (see Table 5.18). In addition to the cost of pumpset and accessories, a sum of Rs.928.17 per borrowing household was also incurred by the beneficiaries for transportation, installation, energisation, repair and maintenance etc. Maximum expenditure was incurred for installation, followed by energization. The details are shown in Table 5.19.

The average number of days worked per pumpset was highest in size group II, whereas the average number of hours

worked was highest in size group III. The average number of days worked per pumpset per annum was 85.56 whereas the average number of hours worked was 112.25, i.e., an average of 1.3 hours per day.

The cropwise gross area irrigated per pumpset in the different size groups is given in Table 5.21. Coconut was the most irrigated crop with 0.27 hectares irrigated followed by arecanut with 0.14 hectares under irrigation. The maximum area irrigated was in size group III, with 0.71 hectares irrigated per pumpset. The average area irrigated per pumpset for the beneficiaries was 0.43 hectares.

There was considerable mismatch between the area irrigated and HP of pumpset acquired. Out of the 52 farmers having 3 HP pumpsets, 34 had less than one hectare of land. A 5 HP pumpset was acquired by a farmer with 17 ares of wetland and another of 1.5 HP was given to a farmer with just 7 ares of garden land. This indicated a serious wastage of energy and loanable funds.

The wells often failed the farmers. The average of number of months for which crops were irrigated was 5.75, but in many cases wells dried up in summer and the crops could be irrigated only for 4-4½ months. For the same reason the farmers could not make much money by selling water. The average income earned by sale of water was Rs.88.43 per beneficiary. Income generated through sale of water was highest

in size group III and was minimum in size group II (Table 5.22).

The pumpset loans are given for a period of 3 years, to be repaid in half-yearly instalments. The interest rate charged is 12.5 per cent per annum.

A fact worth noting was that there was no case of overdues. However, further probing made it clear that the repayment was rather enforced upon the borrowers by the Revenue Recovery Act of July 1981, which conferred upon the banks the authority to confiscate the beneficiaries' properties to the extent of the debt, through the revenue department. However, majority of the farmers were seen to make prompt repayments. One serious problem faced by the borrowers was delay in energisation. Thirtyfour beneficiaries reported delay in energisation; of which there was one case of delay of five and a half years in energisation. Nine farmers experienced delays more than one year and eight farmers reported upto one year delay in energisation. This was indeed a serious problem which made prompt repayment of the instalments very difficult. Default in repayment adds more to the debt by way of interest and the asset becomes a burden to the beneficiary.

Eventhough the problem of overdues was not noticed in any size group, the economic feasibility and repayment capacity of the loans were also worked out and the calculations are given below.

Economic feasibility of the loan:

$$\Delta Y_f > Q + \Delta C - S$$

Class I:

$$332.55 < 449.44 + 293.76 - 85.56$$

$$332.55 < 657.64$$

Class II:

$$1096.86 < 585.81 + 530.09 - 5.43$$

$$1096.86 < 1110.47$$

Class III:

$$1859.61 > 594.66 + 1091.5 - 210.07$$

$$1859.61 > 1476.09$$

Overall:

$$1814.44 > 485.93 + 693.47 - 88.43$$

$$1814.44 > 1090.97$$

Repayment capacity

$$R = Y - (C + L) \quad R > Q'$$

Class I:

$$R = 10345 - (7586.29 + 0) = 2759.71$$

$$2759.71 > Q' = 1177.1$$

Class II:

$$R = 13718.04 - (11297.39 + 539) = 1881.65$$

$$1881.65 > Q' = 1547.4$$

Q = Annual capital charge for the serviceable life of the asset. It is taken to be 20 years.

Q' = Annual capital charge for the period of the loan, i.e., 3 years.

Class III:

$$R = 20472.8 - (12624.27 + 258.93) = 7589.60$$

$$7589.60 > Q' = 1557.44$$

Overall:

$$R = 14615.5 - (10540.45 + 303.26) = 3771.79$$

$$3771.79 > Q' = 1272.68$$

In all the size groups and for the sample as a whole, the loans passed the test of repayment capacity. Though there was economic feasibility in the overall sense, it is worth mentioning that the first two size groups did not pass the test of economic feasibility.

Table 5.17. Areawise, H.P.wise classification of facility acquired

Class	Horse power				Total
	1.5	3	4	5	
I	19	10	0	1	30
II	12	24	1	3	40
III	7	18	1	2	28
Total	38	52	2	6	98

Table 5.18. Cost and loan components of facility (in rupees)

Class	Cost	Loan	Subsidy
I	2568.23	1993.79	574.44
II	3376.07	1962.80	675.47
III	3398.05	2709.76	488.29
Overall	2776.76	2185.70	591.06

Table 5.19. Miscellaneous expenses (in rupees)

Class	Cost of transportation	Cost of installation	Cost of energisation	Extra- neous costs	Repairs and main- tenance	Total
I	107.76	301.72	27.59	27.59	53.54	518.20
II	108.23	616.25	208.75	47.50	187.45	1059.95
III	106.79	585.71	173.21	50.00	109.21	1024.92
Overall	107.67	511.24	143.14	42.12	124.10	928.17

Table 5.20. Fuel charge per hour per pumpset

Class	Fuel used		Fuel charge/hr		Overall (Rs)
	Diesel (No.)	Current (No.)	Diesel (Rs)	Current (Rs)	
I	13	17	2.99	1.49	2.14
II	8	32	3.15	1.25	1.64
III	3	25	3.28	1.70	1.75
Overall	24	74	3.08	1.46	2.65

Table 5.21. Cropwise area irrigated per pumpset (in hectares)

Class	Coconut	Arecanut	Banana	Paddy	Others	Total
I	0.22	0.09	0.00	0.01	0.00	0.32
II	0.26	0.15	0.01	0.10	0.00	0.52
III	0.39	0.19	0.02	0.10	0.01	0.71
Overall	0.27	0.14	0.01	0.09	insig.	0.43

Table 5.22. Use of the facility acquired

Class	Average number of days worked	Average number of hours worked	Income from hiring out water (Rs)
I	81.77	90.47	85.56
II	89.75	119.91	5.43
III	83.64	124.66	210.07
Overall	85.56	112.25	88.43

III. IMPROVEMENTS IN FARMING PRACTICES

Irrigation development on the farm, following banks' assistance has helped the farmers to resort to multiple cropping, putting the land to more intensive use. Many changes were noticed in the use of other inputs like manures and fertilizers and these changes are discussed below.

1. Cropping pattern

Cropping pattern of the beneficiaries mainly consisted of paddy, coconut, arecanut and banana, in addition to tree crops like mango, jack and cashew, which are a common feature in all homesteads. This pattern did not undergo any change due to irrigation development, but the relative importance of the various crops in the cropping pattern changed significantly.

Table 5.23 shows the cropping pattern of the beneficiaries in the period prior to acquiring irrigation facility. The cropping pattern after acquiring facility is shown in Table 5.24. It can be seen from the tables that paddy accounted for the major share in the cropped area for the sample as a whole and for size groups II and III in the period prior to acquiring facility. But following irrigation development, the area under paddy declined in all size classes, eventhough it continued to occupy the major portion of the cropped area in classes II and III. The area under paddy for the sample

as a whole also declined from 48.64% to 39.29%. The area under coconut increased in all the size classes. It increased from 36.59% to 50% in class I, from 25.56% to 31.63% in group II and from 22.79% to 27.01% in size group III. The area under arecanut increased in size group I, whereas, it declined in groups II and III. For the sample as a whole, it declined slightly from 15.69% to 15.18%.

The area under banana was almost insignificant in the period prior to acquiring facility. However, following irrigation development, the area under banana increased considerably. Banana contributed 2.5%, 3.66% and 1.42% of the total cropped area in size group I, II and III respectively. For the sample as a whole, the area under banana increased from 0.98% to 1.79%.

Not only the proportion of area under different crops changed following irrigation, but the cropping intensity also increased significantly as revealed by Tables 5.25 and 5.26. The cropping intensity for the sample increased from 118.34 per cent to 132.88 per cent. The net cropped area as well as gross cropped area declined in size group I, in the period after acquiring facility, but the cropping intensity increased. The decline in area in size group I was due to sale of land by some of the respondents after acquiring irrigation facility.

The results suggest a replacement of less remunerative crops by more remunerative crops and more intensive use of land.

The farmers are found to shift from labour intensive crops like paddy to less labour intensive, irrigation responsive and comparatively more remunerative crops like coconut, arecanut and banana.

2. Input use

The quantity of various inputs like seeds, manures and fertilizers applied to various crops in the periods prior to and after acquiring facility are given in Tables 5.27 and 5.28 respectively.

a) Paddy

The seed rate used by the respondents was enormously high in both periods. Compared to the recommendation of 80-100 kg/ha, the farmers in size group I used 150-160 kg seeds per hectare. The farmers in group II and III were found to use 170-200 kg and 180-200 kg seeds per hectare respectively.

Majority of the farmers used local varieties. The number of farmers cultivating high yielding variety of paddy were 2, 2 and 10 in Virippu, Mundakan and Puncha respectively. The corresponding figures for local variety were 16, 16 and 10 respectively.

Manures and fertilizers

There was a decline in the use of organic manure for paddy in all the size groups and also for both local and high yielding varieties. Except for the puncha crop, there was

no change in the quantity of chemical fertilizers added to local varieties of paddy and the dose was low compared to the recommendations. For the puncha local crop, the dose of chemical fertilizers increased in the period after acquiring facility and the dose was even higher than the recommended dose, as can be seen from Table 5.28. Compared to the recommended dose of 40:20:20 kg of N:P:K per hectare, the sample farmers were found to apply 56.94, 23.03 and 24.15 kg of N:P:K per hectare.

In the case of high yielding varieties of paddy, a very heavy dose of chemical fertilizers are applied with little or no organic manure in all seasons. The dose of chemical fertilizers increased in all the size classes compared to the pre-investment period. Organic manure was applied in the pre-investment period, eventhough in meagre quantities of 0.38 to 0.95 kg per hectare, but it declined to zero in all the size groups in the post-investment period.

The main reasons for the decline in application of organic manure is the non-availability and high cost of green leaves, ash and farm yard manure. Transportation and application also are very expensive because of high cost of labour. Chemical fertilizers, eventhough very costly, are easy to handle and hence it demands only less labour charges for application.

b) Coconut and arecanut

The farmers in class I did not apply any chemical fertilizers to their palms before acquiring facility and they continued to be so after acquiring facility also. Coconut cultivators in class II and III did apply chemical fertilizers, but in amounts which are very meagre compared to the recommended dose of 0.5, 0.33 and 1.2 kg N:P:K per palm per year. However, the dose increased from 0.10, 0.07 and 0.20 kg N:P:K per palm per year in pre-investment period to 0.16, 0.09 and 0.25 kg N:P:K per palm per year in the post-investment period. For arecanut the dose of chemical fertilizers increased from 1.84, 0.97 and 2.94 g of N:P:K per palm to 2.24, 3.59 and 4.21 g of N:P:K per palm. The classwise details are shown in Tables 5.27 and 5.28.

Some quantities of organic manure were being applied to the palms, both prior to and after acquiring facility and this did not show much change after acquiring irrigation facility. The farmers in size group I, II and III were found to apply 18.54, 19.68 and 21.32 kg of organic manure per coconut palm. For arecanut they applied 6.08, 10.83 and 8.8 kg organic manure per hectare which was not the same before. Rates of application of organic manures for these crops remained below the rates recommended in package of practices.

c) Banana

Banana (Nendran) accounted for a very meagre portion of the total cropped area in the period prior to acquiring facility and only very few people cultivated it in a commercial scale. But with the installation of pumpsets in their homesteads, many farmers started cultivating banana. The dose of both organic manures and chemical fertilizers for banana in the period after acquiring facility is given in Table 5.28. The dose of fertilizers was higher than the recommended dose of 190, 115 and 300 kg N, P, K per hectare in size groups II and III. The dose of nitrogen was higher in all the size groups. For the sample as a whole, the dose of nitrogen and phosphorus were higher than the recommendations, but that of potassium was lower than the recommended dose. The rate of fertilizer application was found to be 252.04, 163.39 and 243.54 kg of N:P:K per hectare for the sample as a whole. Organic manure was applied at the rate of 4.73 kg per plant in the place of the recommended dose of 10 kg per plant.

Not only the dose of fertilizers, but their application was also unscientific. Nitrogen was the most favoured nutrient and was given in very heavy dose compared to phosphorus and potassium. The split application of fertilizers was not at all according to recommendations. For paddy and

banana, nitrogen was applied even after flowering. For coconut and arecanut, split application was not at all practised, mainly due to high labour charges. Inter-cultural operations and fertilizer applications were restricted to once in a year in the period after acquiring facility, as against twice in the pre-investment period.

Most of the farmers were not aware of the correct dose and methods of application of manures and fertilizers. Even those who knew, were not keen in following them, as according to them, they will wind up in utter loss if they follow the package of practices. With the costs of manures, fertilizers and labour going up every day, they cannot be blamed.

Irrigated area

There was an increase in irrigated area in the period after acquiring facility as compared to the period prior to acquiring facility. The irrigated area before and after acquiring facility is given in Table 5.29 and 5.30 respectively. The percentage of irrigated area to total area increased significantly in the post-investment period. In size group I, it increased from 31.74% to 96.47%, in size group II from 48.79% to 71.25% and from 50.37% to 92.35% in group III. For the sample as a whole, it rose from 47.54% to 82.91%.

Another interesting phenomenon is a shift in the power used for irrigation (see Table 5.31 and 5.32). The irrigated

area in the sample as a whole rose from 13.31 ha to 22.56 hectares following irrigation development. Whereas in the period prior to acquiring facility 5.95 ha, i.e., 44.7% of the irrigated area was irrigated by animal and human labour, their contribution was nil in the period after acquiring facility. The whole of 22.56 ha was irrigated by pumpsets in the post-investment period. Thus the costly animal and human labour were replaced by a cheap and efficient source of power with banks' assistance.

Table 5.23. Cropping pattern - period prior to acquiring facility (Area in hectares)

Sl. No.	Crops	Class I N=30	Class II N=40	Class III N=28	Overall N=98
1	Paddy	0.12 (29.27)	0.39 (43.33)	1.03 (55.68)	0.49 (48.04)
2	Coconut	0.15 (36.58)	0.23 (25.56)	0.42 (22.70)	0.26 (25.49)
3	Areca nut	0.08 (19.51)	0.16 (17.79)	0.25 (13.51)	0.16 (15.69)
4	Banana	Insig.	0.01 (1.11)	0.01 (0.54)	0.01 (0.98)
5	Mango	0.03 (7.32)	0.04 (4.44)	0.06 (3.24)	0.04 (3.92)
6	Jack	0.02 (4.88)	0.03 (3.33)	0.05 (2.71)	0.03 (2.94)
7	Others	0.01 (2.44)	0.04 (4.44)	0.03 (1.62)	0.03 (2.94)
Total		0.41 (100)	0.90 (100)	1.85 (100)	1.02 (100)

Figures in parentheses are percentages to total

Table 5.24. Cropping pattern - period after acquiring facility (Area in hectares)

Sl. No.	Crops	Class I N=30	Class II N=40	Class III N=28	Overall N=98
1	Paddy	0.02 (5.00)	0.34 (34.70)	1.05 (49.76)	0.44 (39.29)
2	Coconut	0.20 (50.00)	0.31 (31.63)	0.57 (27.02)	0.35 (31.25)
3	Arecanut	0.07 (17.5)	0.17 (17.35)	0.29 (13.74)	0.17 (15.18)
4	Banana	0.01 (2.50)	0.03 (3.06)	0.03 (1.42)	0.02 (1.79)
5	Mango	0.03 (7.50)	0.04 (4.08)	0.07 (3.32)	0.05 (4.46)
6	Jack	0.03 (7.50)	0.03 (3.06)	0.05 (2.37)	0.04 (3.57)
7	Others	0.04 (10.00)	0.06 (6.12)	0.05 (2.37)	0.05 (4.46)
Total		0.04 (100)	0.98 (100)	2.11 (100)	1.12 (100)

Figures in parentheses are percentages to total

Table 5.25. Cropping intensity - period prior to taking loan

Classes	Net cropped area (ha)	Gross cropped area (ha)	Percentage of G.C.A. to N.C.A.
I	10.49	12.39	118.11
II	31.09	36.13	116.21
III	9.52	51.79	131.01
Overall	27.49	33.74	122.74

Table 5.26. Cropping intensity - after acquiring facility

Classes	Net cropped area (ha)	Gross cropped area (ha)	Percentage of G.C.A. to N.C.A.
I	9.06	11.90	131.35
II	31.13	38.71	124.35
III	40.15	59.02	147.00
Overall	27.27	36.79	134.91

Table 5.27. Input use - period prior to acquiring facility

Crops	Recommended		Size groups of holdings			Overall
	Unit	Dose	Class I	Class II	Class III	
1	2	3	4	5	6	7
1. Paddy						
a. Seeds	kg/ha	80-100	150-160	170-200	150-200	172-197
b. Fertilizers:						
Loal						
Virippu N	kg/ha	40	32.31	33.17	38.33	35.00
P	kg/ha	20	15.02	16.82	17.30	16.78
K	kg/ha	20	12.32	14.00	15.23	14.23
c. Mundakan						
N	kg/ha	40	39.27	33.28	33.18	33.99
P	kg/ha	20	15.00	13.23	17.30	16.97
K	kg/ha	20	12.02	15.03	15.61	14.91
Puncha:						
N	kg/ha	40		42.82	40.72	41.54
P	kg/ha	20		20.30	17.05	18.35
K	kg/ha	20		21.23	16.81	18.58
High yielding variety:						
Virippu: N	kg/ha	70		58.17		58.17
P	kg/ha	35		32.31		32.31
K	kg/ha	35		27.88		27.88
Mundakan:						
N	kg/ha	70		60.02		60.02
P	kg/ha	35		23.71		23.71
K	kg/ha	35		25.82		25.82
Puncha:						
N	kg/ha	70		60.83	60.03	60.43
P	kg/ha	35		28.21	28.71	28.45
K	kg/ha	35		27.00	28.00	27.50

(contd.)

Table 5.27. continued

	1	2	3	4	5	6	7
2. Coconut: N	kg/palm	0.50			0.09	0.20	0.1
P	kg/palm	0.33			0.10	0.10	0.07
K	kg/palm	1.20			0.20	0.40	0.20
3. Arecanut:							
N	g/plant	100	-		2.00	3.00	1.74
P	g/plant	40	-		0.00	3.01	0.97
K	g/plant	140	-		2.46	6.20	2.94
4. Banana	Nil	-	-	-	-	-	-
Organic manure							
a. Paddy							
Local variety							
Virippu	t/ha	5	0.93		1.00	0.90	0.95
Mundakan	t/ha	5	0.50		0.31	0.41	0.38
Puncha	t/ha	5	-		0.91	0.80	0.84
b. Paddy							
High yielding variety							
Virippu	t/ha	5	-		0.92	-	0.92
Mundakan	t/ha	5	-		0.60	-	0.30
Puncha	t/ha	5	-		0.82	0.60	0.71
c. Coconut	kg/palm	25-50	18.54		19.68	21.32	19.84
d. Arecanut	kg/palm	12	6.05		10.83	8.80	8.78
e. Banana	kg/palm	10	-		1.92	2.50	2.15

Table 5.28. Input use - after acquiring facility

Sl. No.	Crops	Recommended		Size groups of holding			Overall
		Unit	Dose	Class I	Class II	Class III	
1	Paddy:						
	Seeds	kg/ha	80-100	150-160	170-200	180-200	172-197
	Local variety:						
	Virippu: N	kg/ha	40	32.81	33.17	38.33	35.06
	P	kg/ha	20	15.02	16.82	17.30	16.78
	K	kg/ha	20	12.32	14.00	15.23	14.25
	Mundakan:						
	N	kg/ha	40	39.27	33.28	33.18	33.99
	P	kg/ha	20	15.00	17.20	17.30	16.97
	K	kg/ha	20	12.02	15.03	15.61	14.91
	Puncha: N	kg/ha	40	-	49.72	61.75	56.94
	P	kg/ha	20	-	26.01	21.05	23.03
	K	kg/ha	20	-	27.23	22.10	24.15
	High yielding variety:						
	Virippu: N	kg/ha	70	-	72.64	-	72.64
	P	kg/ha	35	-	40.81	-	40.81
	K	kg/ha	35	-	38.31	-	38.31
	Mundakan:						
	N	kg/ha	70	-	74.03	-	74.03
	P	kg/ha	35	-	34.00	-	34.00
	K	kg/ha	35	-	36.80	-	36.80
	Puncha: N	kg/ha	70	-	75.57	76.67	76.12
	P	kg/ha	35	-	33.34	35.00	34.17
	K	kg/ha	35	-	36.69	38.81	37.75

(contd.)

Table 5.28. continued

Sl. Crops No.	Recommended		Size groups of holding			Overall
	Unit	Dose	Class I	Class II	Class III	
2 Coconut:	N	kg/palm 0.5	-	0.14	0.35	0.16
	P	kg/palm 0.33	-	0.14	0.12	0.09
	K	kg/palm 1.20	-	0.27	0.45	0.25
3 Arecanut:	N	g/palm 100	-	2.56	3.89	2.24
	P	g/palm 40	-	2.60	8.01	3.59
	K	g/palm 140	-	3.56	8.80	4.21
4 Banana:	N	kg/ha 130	200.00	200.00	341.75	252.07
	P	kg/ha 115	112.7	138.33	225.00	163.89
	K	kg/ha 300	150.00	201.67	350.09	243.54
Organic manure:						
1 Paddy - Local						
	Virippu:	tonnes/ha 5	0.65	0.81	0.83	0.80
	Mundakan	tonnes/ha 5	0.32	0.32	0.31	0.32
	Puncha	tonnes/ha 5	-	0.23	0.14	0.18
2 High yielding variety						
	Virippu	tonnes/ha 5	Nil			
	Mundakan	tonnes/ha 5	Nil			
	Puncha	tonnes/ha 5	Nil	0.56	0.17	0.36
3	Coconut	kg/palm 25-50	18.54	19.68	21.32	20.83
4	Arecanut	kg/palm 12	6.05	10.83	8.80	8.78
5	Banana	kg/palm 10	4.31	5.61	4.17	4.73

Table 5.29. Irrigated area - period prior to acquiring facility (area in hectares)

Classes	Net cropped area	Net irrigated area	Percentage
I	10.49	3.33	31.74
II	31.09	15.17	48.79
III	39.53	19.91	50.37
Overall	27.49	13.07	47.54

Table 5.30. Irrigated area - period after acquiring facility (area in hectares)

Classes	Net cropped area	Net irrigated area	Percentage
I	9.06	8.74	96.47
II	31.13	22.18	71.25
III	40.15	37.08	92.35
Overall	27.21	22.61	82.91

Table 5.31. Power used for irrigation - period prior to acquiring facility (area in hectares)

Classes	Net area irrigated				
	Bullock	Human	Oil engine	Electric motor	Total
I	1.11 (33.33)	0.62 (18.63)	0.80 (24.02)	0.80 (24.02)	3.33 (100)
II	7.24 (45.92)	2.17 (13.76)	3.30 (20.92)	3.06 (19.40)	15.17 (100)
III	5.00 (25.11)	0.42 (2.11)	5.90 (29.64)	8.59 (43.14)	19.91 (100)
Overall	4.76 (35.76)	1.19 (8.94)	3.33 (25.02)	4.03 (30.28)	13.31 (100)

Figures in parentheses are percentages to total

Table 5.32. Power used for irrigation - period after acquiring facility (area in hectares)

Classes	Net area irrigated				
	Bullock	Human	Oil engine	Electric motor	Total
I	-	-	3.23 (37.47)	5.39 (62.53)	8.62 (100)
II	-	-	5.04 (22.67)	17.10 (77.33)	22.14 (100)
III	-	-	7.72 (20.82)	29.36 (79.18)	37.08 (100)
Overall	-	-	5.30 (23.49)	17.28 (76.51)	22.56 (100)

Figures in parentheses are percentages to total

IV. INCREASE IN OUTPUT AND YIELD RATES

Increase in output and yield rates could be calculated only in the case of coconut.

In the case of paddy only 10 cultivators irrigated their paddy fields with the pumpset acquired through bank finance. Since this was unlikely to produce any remarkable change in average output and yield rates of paddy, which could be attributed to improvement in irrigation facility (since it is mainly rainfed), these were not worked out.

In the case of arecanut, the most common method of sale was contract sales, wherein depending on the health, vigour and production of nuts, an average price is quoted for the palm for a year. Once the contract is effected, the contractor will look after the palms till the bunches are harvested. He will be solely responsible for any profit or loss accruing out of the contract. The producer knew only about what they got in money terms, but had no idea about the production of nuts. Hence the output and yield rates of arecanut also could not be worked out.

The productivity and yield of banana also could not be worked out because no farmer could with reasonable degree of accuracy, say the weight of a bunch. They could only give the average price they got for a 'good' bunch, an 'average' bunch etc.

However, in case of coconut, the farmers could furnish information on the average number of coconuts obtained per palm per year in both the periods prior to and after acquiring facility. From the data, the production and productivity of palms in both periods were worked out and the same is presented in Tables 5.33 and 5.34 respectively.

The output per farm increased by 30.08% in the period after irrigation development as compared with the period prior to acquiring facility. The increase in output was the highest in size group II, being 34.6% and was lowest in size group I being 23.12%.

The per palm productivity increased from 54 nuts per palm in the period prior to acquiring facility to 67 nuts per palm in the period after acquiring facility i.e., 24.07%. Here also, the increase was highest in size group II, being 26.92%. The productivity was lowest in size group II, being 44 in the period prior to acquiring facility and 53 in the period after acquiring facility. The palms in size group III, had comparatively higher productivity, being 67 and 81 in the period prior to and after acquiring facility respectively.

The production increased more than proportionately with the increase in productivity because there was an increase in the number of bearing palms in all the size groups.

The number of bearing palms rose from 998 to 1020 in size group I, from 1913 to 2028 in group II and from 2121 to 2378 in group III.

The productivity was lowest in size group I, because of poor management of the palms. The palms in group II and III were comparatively better managed and hence had a higher productivity.

The entire increase in productivity and production cannot certainly be attributed to irrigation development. There was also an increase in the fertilizer use in palms in size group II and III during the same period. Part of the increase may be due to this, but increase in irrigation definitely played a role in increasing output and yield rate.

So also, the increase in productivity is not very impressive because almost all the palms were irrigated in the period prior to acquiring facility, by using human and animal labour. But irrigation by pumpset was more efficient and hence the increase in productivity and production.

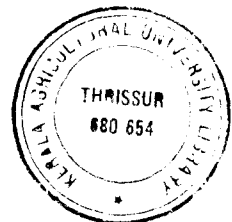


Table 5.33. Output of coconuts per farm before and after acquiring facility

Class	Output		Percentage of change
	Before	After	
I	1626	2002	23.12
II	2486	3346	34.60
III	5075	6794	33.88
Overall	3005	3909	30.08

Table 5.34. Yield per palm prior to and after acquiring facility

Class	Productivity		Percentage of change
	Before	After	
I	44	53	20.45
II	52	66	26.92
III	67	81	20.90
Overall	54	67	24.07

V. INCOME AND EMPLOYMENT GENERATED

a. Income generated

In order to find the impact of irrigation on farm income, the income from the various crops grown in the period prior to and after acquiring facility were worked out and compared. Three measures of income, viz., (a) the net income, (b) family labour income and (c) farm business income were used for comparison.

1. Net income

The per hectare net income from all crops increased from Rs.4177.26 in the period prior to acquiring facility to Rs.6174.65 after acquiring facility. The per hectare net income increased in all the size classes. It increased from Rs.4857.47 to Rs.5947.72 in group I, Rs.4126.79 to Rs.5762.08 in group II and from Rs.4115.72 to Rs.6837.07 in size group III. Major contributor towards income was coconut in the period prior to acquiring facility, whereas banana was the main contributor in the post-investment period as shown in Table 5.35. Banana was cultivated by only very few people in the pre-investment period and that too not in a commercial scale. Hence its income in the pre-investment period was negligible. However, following irrigation development, many farmers started cultivating banana on commercial basis and

the per hectare net income was Rs.9214.23, Rs.9330.14 and Rs.13776.70 in size groups I, II and III respectively. The income for the sample as a whole was Rs.10935.31. The per hectare net income from coconut increased from Rs.7459.97 to Rs.8521.12 following irrigation development, eventhough it declined from Rs.7600.78 to Rs.7429.80 in group I. Most noticeable increase was observed in the case of arecanut, as can be seen from Table 5.35.

There was not much change in the income from both local and high yielding varieties of paddy, as they were not much influenced by irrigation development. Majority of the pumpsets acquired through bank finance were used to irrigate garden land. Hence there were only slight variations in production and income from paddy. The income from local varieties of paddy increased slightly in Virippu and Mundakan, but it declined in Puncha. In case of high yielding varieties, the income declined in Mundakan and Puncha, but increased in Virippu. These changes appear to be more due to seasonal variations, than due to irrigation development through bank finance.

Family labour income

Family labour income is the profit at cost B and represents the income of the cultivator on account of his own and family labour. The per hectare family labour income in both periods are shown in Table 5.36.

For the sample as a whole, as also in different size groups family labour income registered an increase after irrigation. Banana contributed maximum towards family labour income in the post-investment period and coconut in the pre-investment period. The per hectare family labour income increased from Rs.4340.67 to Rs.6354.02 for the sample as a whole. The corresponding figures for net income were Rs.4177.26 and Rs.6174.65. The greater extent of change in family labour income reflects a greater use of family labour in post-investment period. In case of arecanut, it was Rs.1661.24 in pre-investment period and Rs.2933.95 in the post-investment period. The family labour income from banana was Rs.9814.73 in size group I, Rs.9805.14 in size group II and Rs.14201.84 in size group III.

3. Farm business income

This is the profit at cost A. It gives farm business income of the cultivators. The data pertaining to farm business income before and after acquiring facility are furnished in Table 5.37. Here also, the same increasing trend is noticed in all the size groups and for all the crops except high yielding variety paddy.

Banana was found to be the most remunerative crop as per the analysis, followed by coconut and arecanut. The farmers started cultivating banana, when they were assured of irrigation. Nendran variety of banana is responsive to

irrigation and has a good market and thus ensures a good income to the farmer. This is a welcome change brought about by the bank's assistance. The study shows that in keeping with expectations and other research results, the irrigation development programme of commercial banks has also generated additional income in all size groups of the beneficiaries and for the sample as a whole.

b. Employment generated

Data pertaining to per farm and per hectare labour utilization is shown in Table 5.38 and 5.39 respectively. The data show that there was a decline in per farm human labour utilization in size groups I and II, whereas it increased slightly in size group III. In size group I, it decreased from 11.66 mandays to 8.34 mandays and in size group II it decreased from 26.16 mandays to 24.93 mandays following irrigation development. In size group III, manday utilization increased from 47.26 to 47.33. All the changes were statistically significant. The per hectare manday utilization however, decreased in all size classes in the period after irrigation development as shown in Table 5.25. It decreased from 31.66 mandays to 27.66 mandays, for the sample as a whole.

There was a decline in per farm bullock labour utilization in all size groups in the period after irrigation

development. The same trend was observed for per hectare bullock labour utilization also, as can be seen from Table 5.39.

The per farm and per hectare utilization of farm machinery increased in all size groups in the period after acquiring facility. The per farm machinery utilization increased from zero hours to 0.14 hours in size group I, from zero to 1.57 hours in size group II and from 0.51 hours to 3.75 hours in size group III. The per hectare machinery utilization also increased in all the size groups and for the sample as a whole it increased from 0.09 hours to 1.46 hours.

Another noteworthy feature is the increase in family labour utilization in all size groups in the period after acquiring facility. The per farm family labour utilization increased from 1.43 mandays to 2.23 mandays in size group I, from 1.5 mandays to 4.16 mandays in size group II and from 2.28 mandays to 2.42 mandays in size group III. All the changes were statistically significant. The per hectare family labour utilization also increased in size groups I and II, but declined from 1.33 mandays to 1.25 mandays in size group III. For the sample as a whole, however it increased from 2.4 mandays to 4.66 mandays per hectare as shown in Table 5.39.

A decline in manday utilization is contrary to what is

generally expected and observed to occur after irrigation development, for it is generally believed that irrigation facilities are land substituting capital and not labour substituting. The observed decline was due to three factors, viz., (1) substitution of bullock and human labour engaged in irrigation by pumpsets, (2) a shift in cropping pattern involving a change from labour intensive crops like paddy to less labour intensive crops like coconut, and (3) high wages of labour.

In the first half of the seventies, coconut and arecanut palms were generally irrigated by bullock labour and to some extent by manual labour. This was however, very costly. Hence when the comparatively cheaper and more efficient method of installing a pumpset was offered, the farmers readily accepted it, thus displacing the human and bullock labour so far engaged in irrigation. Some of the respondents had sold off their land--mainly paddy fields and still others had converted paddy fields into coconut gardens, thus causing a decline in per farm as well as per hectare labour utilization.

The third and probably the most important reason for reduction in labour utilization is the high cost of agricultural labour. The wages for both men and women increased almost two and a half times over the period from 1974-75 to 1981-82. The wages for men which ranged from Rs.8 to Rs.10/- per day in 1974-75 increased to Rs.20/- to Rs.25/- per day

in 1981-82. Many farmers had admitted to deliberately reducing the number of mandays employed, by simply reducing the intercultural operations in garden lands to once in a year instead of twice in a year as was done earlier. The same trend was noticed in the case of wet lands also. An increase in family labour utilization also shows that the farmers are replacing hired labour by family labour to some extent.

In case of bullock labour also, a decline in employment is noticed, mainly due to its high costs. This applies to owned bullock labour also, as very few farmers now keep bullocks--their maintenance being very costly. The presence of a comparatively cheaper and more efficient substitute, viz., the farm machinery, makes the substitution of both hired and owned bullock labour by machines, a very attractive prospect. The sale as well as conversion of paddy land to coconut gardens also is another reason for decline in bullock labour utilization.

Thus the study showed that the change in employment pattern following irrigation development did not conform to expectations and previous observations in the case of hired human and bullock labour utilization. But the results were in keeping with other research findings in the case of family labour and machine labour utilization.

Table 5.35. Per hectare net income prior to and after acquiring facility (in rupees)

Sl. No.	Crop	Class I		Class II		Class III		Overall	
		Before	After	Before	After	Before	After	Before	After
1	Coconut	7600.78	7429.80	7385.46	8357.14	7735.99	9807.82	7549.97	8521.12
2	Arecanut	1667.14	2712.30	1507.03	3301.89	1564.33	2061.17	1572.34	2728.70
3	Banana	-	9214.73	-	9330.14	-	13776.70	-	10935.31
4	Paddy - Local								
	a. Virippu	1374.49	1462.25	1357.02	1370.60	1869.48	1921.53	1551.38	1588.66
	b. Mundakan	1613.88	1559.55	2125.35	2077.07	1934.09	2218.17	1977.69	2074.17
	c. Puncha	-	-	1962.88	2029.17	2330.56	2187.50	2183.49	2124.17
5	Paddy - HYV								
	a. Virippu	-	-	2650.66	3549.25	-	-	2650.66	3549.25
	b. Mundakan	-	-	2701.82	2622.77	-	-	2701.82	2622.77
	c. Puncha	-	-	1281.40	1056.46	3348.44	3221.51	2314.92	2138.98
	Overall	4857.47	5947.22	4126.79	5762.08	4115.72	6837.07	4177.26	6174.65

Table 5.36. Per hectare family labour income prior to and after acquiring facility
(in rupees)

Sl. No.	Crops	Class I		Class II		Class III		Overall	
		Before	After	Before	After	Before	After	Before	After
1	Coconut	7690.99	7576.92	7385.46	8444.61	7735.99	9819.82	7549.95	8606.25
2	Arecanut	1849.14	2957.04	1599.84	3496.64	1564.33	2243.19	1661.24	2933.95
3	Banana	-	9814.73	-	9805.14	-	14201.84	-	11422.61
4	Paddy - local								
	a. Virippu	1414.59	1540.38	1386.42	1438.18	1869.48	1964.86	1561.09	1648.73
	b. Mundakan	1638.18	1695.66	2125.35	2103.10	1934.09	2248.88	1980.73	2115.93
	c. Puncha	-	-	1962.88	2066.67	2330.56	2678.55	2183.49	2433.80
5	Paddy - HYV								
	a. Virippu	-	-	2650.66	2234.07	-	-	2650.66	2234.07
	b. Mundakan	-	-	2701.82	2622.77	-	-	2701.82	2622.77
	c. Puncha	-	-	1281.40	1082.49	3348.44	3221.51	2314.92	2152.00
	Overall	4977.92	6209.63	4154.27	5902.84	4177.26	7004.45	4340.67	6354.02

Table 5.37. Per hectare farm business income prior to and after acquiring facility
(in rupees)

Sl. No.	Crop	Class I		Class II		Class III		Overall	
		Before	After	Before	After	Before	After	Before	After
1	Coconut	10289.86	10198.93	10070.90	11434.21	10784.95	13411.98	10348.57	11666.05
2	Arecanut	3339.10	4725.80	3912.14	6217.61	3551.83	3831.47	3628.31	5010.64
3	Banana	-	15522.03	-	16329.81	-	22255.90	-	18308.92
4	Paddy - local								
	a. Virippu	2258.49	2384.28	2248.49	2298.19	2925.66	3021.04	2503.68	2580.02
	b. Mundakan	2540.58	2698.06	3137.74	3073.84	2976.15	3299.62	2992.40	3113.15
	c. Puncha	-	-	2950.08	3053.87	3501.56	3899.90	3280.97	3561.49
5	Paddy - HYV								
	a. Virippu	-	-	4013.48	3549.29	-	-	4013.48	3549.29
	b. Mundakan	-	-	4145.70	4066.65	-	-	4145.70	4066.65
	c. Puncha	-	-	2424.80	2257.21	5044.17	4951.33	3734.49	3604.27
	Overall	7017.35	9054.68	6245.53	8943.83	6317.59	10395.41	6450.76	9468.24

Table 5.38. Employment pattern per farm - prior to and after acquiring facility

Sl. No.	Items	Class I			Class II			Class III		
		Before	After	't'	Before	After	't'	Before	After	't'
1	Hired mandays	11.66	8.34	3.40*	26.16	24.93	4.50*	47.26	47.33	3.72*
2	Family labour days	1.43	2.23	0.67	1.50	4.16	3.17*	2.28	2.42	2.49*
3	Hired bullock pair days	0.94	Nil	-	3.43	0.72	3.01*	8.20	3.75	3.49*
4	Own bullock pair days	-	-	-	1.81	1.05	1.58*	0.34	0.06	-
5	Machine hours	-	0.14	-	-	1.57	-	0.51	3.75	-

* Significant change in employment

Table 5.39. Per hectare labour utilization - prior to and after acquiring facility

Sl. No.	Items	Class I		Class II		Class III		Overall	
		Before	After	Before	After	Before	After	Before	After
1	Hired man days	33.22	27.92	33.16	29.67	27.67	24.50	31.61	27.66
2	Family labour charges	4.07	7.47	1.90	4.95	1.33	1.25	2.40	4.66
3	Hired bullock pair days	2.68	-	4.35	0.86	4.80	1.94	3.97	0.91
4	Own bullock pair days	-	-	2.29	1.25	0.20	0.03	0.99	0.52
5	Machine hours	-	0.47	-	1.87	0.30	1.94	0.09	1.46

Summary

SUMMARY

Commercial banks entered the field of agricultural finance in a big way following the nationalization of banks in July, 1969. They have many schemes for financing agriculture, amongst which minor irrigation is an important field. In the present study, an evaluation of the pumpset financing scheme of commercial banks in Trichur district was conducted by collecting and analyzing data from a sample of ninetyeight beneficiaries of the pumpset financing scheme of the Lead Bank, viz., the Canara Bank. The objectives of the study were to find out the socio-economic characteristics of the borrowing farmers, the improvements in farming practices, the changes in output and yield rates and income and employment generated by the facility acquired through bank finance. The results of the study are summarized below.

Data were collected from a sample of ninetyeight beneficiaries selected from five villages. For purposes of analysis, they were classified into three groups based on the area owned.

The ninetyeight beneficiaries on whom the study was based belonged to different castes, majority being Hindus. The average family size for the beneficiaries was seven.

Males outnumbered the females in all the villages studied, and the sex ratio was 851. Sixteen beneficiaries were illiterate and literacy for the sample was 89.23%. 62.24% beneficiaries had farming as their main occupation, while 26.53% had service as their main occupation. Most of the farmers had in addition to their main occupation, some subsidiary source of income also, like trade, profession, labour, etc. Agriculture and service was the combination which served the maximum number of families.

Classification of the respondents according to area owned showed that thirty farmers had holdings of size less than 40 ares, while twentyeight farmers owned more than 100 ares of land. Forty beneficiaries had holdings of size 40-100 ares. The family income from all sources and income from farming varied widely among the sample. 31.7% beneficiaries had an annual family income (including net farm income) of Rs.30,000/- and more while 26.6% families had an annual family income less than Rs.7,500/-. The annual per family income for the sample as a whole was Rs.17,922.33 and the average per capita income worked out to Rs.3387.96. The annual net farm income per family also varied widely, being less than Rs.5000/- per annum in the smallest holding size class to Rs.19,345.39 in the largest.

Consumption pattern of the beneficiaries showed that rice was the food grain consumed in largest quantity.

91.25 per cent of the foodgrains consumed was rice. The consumption of wheat and pulses was low in all the size groups of beneficiaries. Clothing and footwear was found to be the second major item of family consumption expenditure. The expenditure on items like education, medicine, recreation, etc. increased progressively with increase in holding size. However, a negative association was found between family income and the proportion of expenditure on food.

53.06 per cent beneficiaries had acquired 3 H.P. pumpsets with bank's assistance and majority of them were run on electricity. There existed considerable mismatch between area operated and H.P. of the pumpset acquired, as sixtythree of the borrowers owned and operated holdings less than a hectare in size. The average cost of a pumpset worked out to Rs.2776.76, of which Rs.591.06 was obtained as subsidy. In addition an amount of Rs.928.17 was incurred per borrower household for transportation, installation, energization, repair, maintenance, etc. The average number of days worked per pumpset was 85.56 per annum and the maximum area irrigated per pumpset was 0.71 ha. Coconut was the crop most benefited by the programme.

No case of overdues was reported. The loan did not satisfy the test of economic feasibility in the smaller holding size groups, eventhough for the sample as a whole,

it was found to be economically feasible. It generated sufficient repayment capacity in all the size groups. However, many farmers were put to difficulty by the delay in energization of the facility acquired.. Moreover wells often failed the farmers. Only few farmers could earn any income from selling water.

Cropping pattern of the beneficiaries consisted mainly of paddy, coconut, arecanut and banana. There was a favourable shift in the cropping pattern of the beneficiaries after acquiring irrigation facility in the sense that the relative importance of commercial crops in the total cropped area recorded an increase. The area under paddy decreased in all the size groups following irrigation development, but it continued to occupy the maximum area in size group III. The area under coconut increased in all the size groups, but that under arecanut increased in size group I, but it decreased in size groups II and III. The area under banana was almost insignificant in the pre-investment period, but it rose to 1.79% of the total cropped area in the post-investment period. The cropping intensity increased in all the size groups and for the sample as a whole, it increased from 118.34 per cent to 132.88 per cent following irrigation development.

Data pertaining to input use showed that the seedrate adopted in the case of paddy was almost twice the recommended

dose. Majority of the cultivators preferred local varieties to high yielding varieties.

The dose of organic manure to all crops was lower than the recommended dose in all size groups in the pre-investment period and it was still lower in the post-investment period. Majority of the farmers applied chemical fertilizers in both periods, but the dose was lower than the recommended rates in the case of coconut, arecanut and local varieties of paddy. In the case of banana and high yielding varieties of paddy, especially the puncha crop, very heavy doses of chemical fertilizers were applied. The farmers were found to apply heavy doses of nitrogen with less of phosphorus and potassium.

As is natural, the extent of irrigated area increased significantly in the post-investment period and the costly animal and human labour used in irrigation were replaced completely by pumpsets.

Production and productivity changes were worked out in the case of coconut only. The productivity per palm increased by 24.07% from 54 nuts to 67 nuts following irrigation development. Meanwhile, the production registered an increase of 30.08%. Eventhough the entire increase in production cannot be attributed to irrigation, it definitely played a significant role in the process.

The income generated was assessed in terms of per hectare net income, family labour income and farm business income. The per hectare net income from all crops increased from Rs.4177.26 in the pre-investment period, to Rs.6174.65 in the post-investment period. Banana was the major contributor towards income in the post-investment period, even though the income from coconut and arecanut also increased significantly. Income from paddy did not undergo much change, as it was least influenced by the programme.

Employment generation of the programme was negative. The per farm human labour utilization decreased in size groups I and II, whereas it increased slightly in size group III. The per hectare labour utilization decreased significantly in all the size groups. The per farm and per hectare bullock labour utilization also declined in the post-investment period. The per farm as well as per hectare machinery utilization increased in all size groups. The family labour utilization also increased significantly. Replacement of human and bullock labour by machinery, substitution of labour intensive crops like paddy by less labour intensive crops like coconut and banana and the high wages of labour are the reasons for the decline in labour utilization.

On the whole, the pumpset financing scheme of Canara Bank has been successful, in the sense that it

enabled the borrowers to put their land to more vigorous use and to realize better yields from their crops. It has been instrumental in increasing the farm income of the beneficiaries, thus enabling them to enjoy a better standard of living.

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*Originals not seen

Appendices

Appendix I

**IMPACT OF BANK FINANCE FOR MINOR IRRIGATION IN TRICHUR
DISTRICT**

QUESTIONNAIRE FOR DATA COLLECTION

**I.1. Name and address
of beneficiary:**

2. Location:

Village

Taluk

Block

3. Religion

Caste:

**4. Year and month of
obtaining bank loan:**

III. Family expenditure

Sl. No.	Item	During the past week		During the previous month		During the previous year	
		Quan- tity	Value	Quan- tity	Value	Quan- tity	Value
			Rs.Ps.		Rs.Ps.		Rs.Ps.
A.	Food						
1.	Rice						
2.	Wheat						
3.	Pulses						
4.	Oil						
5.	Sugar/Jaggery						
6.	Fish						
7.	Meat						
8.	Egg						
9.	Milk						
10.	Vegetables						
11.	Fruits						
12.	Others						
B.	Fuel and lighting						
C.	Clothing						
D.	Education						
E.	Medicines						
F.	Travel						
G.	Entertainment						
H.	Tobacco beedi leaf						
I.	Liquor						

IV. Land holdings:

Land owned Wet land:
 Dry land:
 Garden land:

Land leased in: Wet land:
 Dry land:
 Garden land:

Land leased out: Wet land:
 Dry land:
 Garden land:

Number of fragments operated:

V. Cropping pattern in the year prior to taking loan:

Crop and season	Area	Variety	Quantity of output		Value in rupees		Total value Rs.Ps.
			Paddy	Straw	Paddy Rs.Ps.	Straw Rs.Ps.	
Paddy							
Virippu							
Mundakan							
Puncha							

Other crops

Crops	Area in cents	No. of trees/ plants	No. of bearing trees/ plants	Yield/ annum	Value
1. Pulses					
2. Vegetables					
3. Pineapple					
4. Tapioca					
5. Other tuber crops like yam, dioscoria, amorphophalus					
6. Coconut					
7. Arecanut					
8. Cocoa					
9. Rubber					
10. Jack					
11. Mango					
12. Coffee					
13. Tamarind					
14. Others					

*VI.A. Cost of cultivation of paddy prior to acquiring facility.

Sl. No.	Operations	Animal labour Bullocks (pairs)	Human labour								Quantity and cost of inputs used		Total cost Rs.Ps.						
			Family				Hired				Men	Women		Fragment No.	Area: Bullock:				
			No.	Days	Hrs.	Rs.	No.	Days	Hrs.	Rs.						No.	Days	Hrs.	Rs.
1.	Preparatory cultivation																		
2.	Seeds & Sowing																		
3.	Nursery raising and maintenance																		
4.	Manures and fertilizers																		
5.	Types		1																
			2																
			3																
			4																
			5																
5.	Irrigation																		
6.	Plant protection																		
7.	Weeding and inter- cultivation																		
8.	Harvesting																		
	Total cost																		
	Yield - Paddy																		
	Straw																		
	Value - Paddy @																		
	Straw @																		

*Separate sheets were used for each season and each fragment

*D. Cost of cultivation prior to acquiring facility

Area:
Wage rate: Men: Women:

Sl. No.	Operations	Bullock pairs				Men				Women				Quantity and cost of inputs used		Total cost Rs.Ps.
		No.	Days	Hrs.	Rs.	Family	Hired	Family	Hired	Family	Hired	Family	Hired	Qty. Kg	Cost Rs.	
1.	Land preparation															
2.	Planting material and planting															
3.	Manures and fertilizers															
	Type	1														
		2														
		3														
		4														
		5														
4.	Irrigation															
5.	Plant protection															
6.	Weeding and intercultivation															
7.	Harvesting															
	Total cost															
	Yield - Quantity															
	Value @															

*Cost of cultivation of crops like cocoa, vegetables and other crops were collected using duplicates of this sheet

IX. Minor irrigation facility acquired through bank loan

- a. Digging well
- b. Deepening of well
- c. Installation of pumpsets

(Tick mark the correct answer)

a) Digging/Deepening of well

Purpose	Area of plot where well is dug (cents)	Date of commencement of work	Date of completion	Total area benefitted (cents)	Cost of labour	Rs. Cost of other inputs	Other charges if any

Cost and loan components of facility

Cost of facility	Loan	Subsidy	Time lag in getting the loan sanctioned	Amount repaid	Overdue	Reasons for overdue

Expenditures on repairs and maintenance, if any:

Number of repairs during the past year:

Cost of repairs:

Any other charges involved:

Total cost:

b) Installation of pumpset

Description of pumpset	Cost of pumpset Rs.	Area of plot where installed (cents)	Cost of trans- portation Rs.Ps.	Date of insta- llation	Cost of insta- llation Rs.Ps.	Date of energization	Cost of energization Rs.Ps.	Extraneous costs, if any Rs. Ps.
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XI. Cropping pattern in the period after acquiring irrigation facility

Crop and season	Area	Variety	Quantity of output		Value in Rs.		Total value Rs.
			Paddy	Straw	Paddy	Straw	

Paddy:

Virippu

Mundakan

Puncha

Other crops

Crops	Area in cents	No. of trees/plant	No. of bearing trees/plants	Yield/annum	Value Rs.Ps.
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1. Pulses
2. Vegetables
3. Pineapple
4. Tapioca
5. Other tuber crops
6. Coconut
7. Arecanut
8. Cocoa
9. Rubber
10. Jack
11. Mango
12. Coffee
13. Others

XII. Sourcewise irrigated area in the period after acquiring irrigation facility

Type of land	Own wells/ tanks (cents)	Government canals (cents)	Other sources (cents)
Wet land			
Garden land			
Dry land			

XIII. Income from hiring out water (previous year)

Details of hires	Average No. of hours hired per week	Average No. of weeks hired per month	Average No. of months for which hired	Hiring charges @ Rs. Ps.

Appendix II.1. Per hectare cost of cultivation of paddy
(prior to acquiring facility) (in rupees)

Virippu - Local variety

Items	Class I N=2	Class II N=8	Class III N=6	Overall N=16
1. Hired human labour	690.82 (24.82)	703.41 (22.15)	755.56 (21.97)	721.39 (22.38)
2. Bullock labour	420.20 (15.10)	528.00 (16.62)	539.45 (15.69)	518.82 (16.09)
3. Seeds	251.12 (9.02)	310.28 (9.77)	307.92 (8.96)	302.00 (9.37)
4. Manures	210.40 (7.56)	340.62 (10.72)	304.60 (8.86)	310.84 (9.65)
5. Fertilizers	105.42 (3.79)	153.75 (4.84)	200.87 (5.84)	163.38 (5.07)
6. Irrigation	-	-	-	-
7. Depreciation, repairs and hiring of imple- ments and machinery	-	-	-	-
8. Crop protection	-	-	-	-
9. Interest on working capital	201.35 (7.24)	244.33 (7.69)	253.01 (7.36)	241.94 (7.51)
Cost A	1879.31 (67.53)	2280.39 (71.79)	2361.41 (68.68)	2258.07 (70.07)
10. Rental value of land	346.40 (30.41)	853.60 (26.88)	1076.86 (31.32)	936.42 (29.05)
Cost B	2725.71 (97.94)	3133.99 (98.67)	3438.27 (100)	3194.49 (99.12)
11. Family labour charges	57.25 (2.06)	42.15 (1.33)	-	28.23 (0.88)
Cost C	2782.96 (100)	3176.14 (100)	3438.27 (100)	3222.72 (100)
12. Production:				
Main produce	2109.78 (19.58)*	2225.64 (22.55)*	2914.98 (24.29)*	2469.66 (22.83)*

* Average production in quintals

(contd.)

Figures in parentheses are percentages to total

Appendix II.1. continued

Items	Class I N=2	Class II N=8	Class III N=6	Overall N=16
By produce	2122.22	2242.36	2469.31	2312.45
Per quintal cost of production	33.13	41.41	39.89	39.87
13. Value of total produce	4232.00	4468.00	5384.29	4782.11
14. Profit or loss at Cost C	1449.04	1291.86	1946.02	1559.39
15. Profit or loss at Cost B	1506.29	1334.01	1946.02	1587.62
16. Profit or loss at Cost A	2352.69	2187.61	3022.88	2524.04

Appendix II.2. Cost of cultivation of paddy after acquiring facility (in rupees)

Virippu - Local variety

Sl. No.	Items	Class I N=2	Class II N=8	Class III N=6	Overall N=16
1	2	3	4	5	6
1	Hired human labour	623.79 (22.62)	660.72 (22.55)	787.92 (23.45)	703.80 (22.93)
2	Bullock labour	0	118.42 (4.04)	103.75 (3.10)	98.12 (3.20)
3	Seeds	251.12 (9.11)	310.28 (10.59)	307.92 (9.17)	302.00 (9.84)
4	Manures	195.32 (7.08)	241.58 (8.25)	250.42 (7.45)	239.11 (7.79)
5	Fertilizers	270.29 (9.81)	267.86 (9.14)	387.50 (11.53)	313.28 (10.21)
6	Irrigation	0	0	0	0
7	Depreciation, repairs and hiring of implements and machinery	424.11 (15.38)	222.11 (7.58)	217.08 (6.46)	244.97 (7.98)
8	Crop protection	0	103.89 (3.55)	118.33 (3.52)	96.32 (3.14)
9	Interest on working capital	70.59 (2.56)	76.99 (2.63)	86.92 (2.59)	79.90 (2.60)
	Cost A	1835.22 (66.56)	2001.85 (68.33)	2259.84 (67.27)	2077.50 (67.69)
10	Rental value of land	843.90 (30.61)	860.01 (29.36)	1056.18 (31.44)	931.56 (30.36)
	Cost B	2679.12 (97.17)	2861.86 (97.69)	3316.02 (98.71)	3009.06 (98.05)
11	Family labour charges	78.13 (2.83)	67.58 (2.31)	43.33 (1.29)	59.81 (1.95)
	Cost C	2757.25 (100)	2929.44 (100)	3359.35 (100)	3068.87 (100)
12	Production:				
	Main produce	2097.28 (18.61)*	2257.68 (19.98)*	2811.57 (23.49)*	2445.34 (21.13)*
	By produce	2122.22	2042.36	2469.31	2212.45

* Average production in quintals

(contd.)

Figures in parentheses are percentages to total

Appendix II.2. continued

1	2	3	4	5	6
	Per quintal cost of production	34.12	44.40	37.89	40.53
13	Value of total produce	4219.50	4300.04	5280.88	4657.79
14	Profit or loss at Cost C	1462.25	1370.60	1921.53	1588.92
15	Profit or loss at Cost B	1540.38	1438.18	1964.86	1648.73
16	Profit or loss at Cost A	2384.28	2298.19	3021.04	2580.29

Appendix II.3. Per hectare cost of cultivation of paddy
(prior to acquiring facility)(in rupees)

Mundakan - Local variety

Items	Class I N=2	Class II N=7	Class III N=7	Overall N=16
1. Hired human labour	826.85 (30.08)	789.35 (25.58)	802.18 (24.18)	799.65 (25.42)
2. Bullock labour	329.18 (11.98)	540.48 (17.51)	556.75 (16.78)	521.19 (16.57)
3. Seeds	251.12 (9.14)	279.59 (9.06)	309.29 (9.32)	289.03 (9.19)
4. Manures	115.35 (4.19)	150.23 (4.87)	183.41 (5.53)	160.39 (5.10)
5. Fertilizers	72.18 (2.63)	93.39 (3.03)	151.48 (4.57)	116.15 (3.69)
6. Irrigation	-	-	-	-
7. Crop protection	-	-	-	-
8. Depreciation, repairs and hiring of implements and machinery	-	-	25.00 (0.75)	10.94 (0.35)
9. Interest on working capital	191.36 (6.96)	222.36 (7.21)	243.37 (7.33)	227.68 (7.24)
Cost A	1786.04 (64.98)	2075.40 (67.26)	2271.48 (68.46)	2125.03 (67.56)
10. Rental value of land	902.40 (32.83)	972.75 (31.52)	1046.50 (31.54)	996.22 (31.67)
Cost B	2688.44 (97.81)	3048.15 (98.78)	3317.98 (100)	3121.25 (99.23)
11. Family labour charges	60.19 (2.19)	37.79 (1.22)	-	24.06 (0.77)
Cost C	2748.63 (100)	3085.94 (100)	3317.98 (100)	3145.31 (100)
12. Production:				
Main produce	2468.02 (21.61)	2679.41 (24.35)	3058.20 (26.49)	2818.71 (24.94)
By produce	2044.00	2184.35	2174.28	2162.40

Figures in parentheses are percentages to total

(oontd.)

Appendix. II.3. continued

Items	Class I N=2	Class II N=7	Class III N=7	Overall N=16
Per quintal cost of production	32.61	37.02	43.17	39.41
13. Value of total produce	4512.02	4863.76	5232.48	4981.11
14. Profit or loss at Cost C	1763.39	1777.82	1914.50	1835.80
15. Profit or loss at Cost B	1823.58	1815.61	1914.50	1859.86
16. Profit or loss at Cost A	2725.98	2788.36	2961.00	2856.08

Appendix II.4. Cost of cultivation of paddy after acquiring facility (in rupees)

Mundakan - Local variety

Sl. No.	Items	Class I N=2	Class II N=7	Class III N=7	Overall N=16
1	2	3	4	5	6
1	Hired human labour	815.18 (27.61)	726.82 (26.18)	816.07 (26.88)	776.91 (26.68)
2	Bullock labour	0	119.34 (4.29)	93.93 (3.10)	93.31 (3.20)
3	Seeds	251.12 (8.51)	279.59 (10.67)	309.29 (10.19)	289.03 (9.93)
4	Manures	95.32 (3.23)	96.78 (3.49)	93.21 (3.07)	95.04 (3.26)
5	Fertilizers	254.62 (8.62)	204.19 (7.35)	277.14 (9.13)	242.41 (8.32)
6	Irrigation	0	15.63 (0.56)	10.71 (0.35)	11.52 (0.40)
7	Crop protection	0	64.69 (2.33)	121.43 (4.00)	81.43 (2.80)
8	Depreciation, re- pairs and hiring of implements and machinery	424.11 (14.36)	204.38 (7.36)	157.14 (5.18)	211.18 (7.25)
9	Interest on working capital	73.61 (2.50)	68.46 (2.47)	75.16 (2.48)	72.04 (2.47)
	Cost A	1913.96 (64.33)	1779.88 (64.10)	1954.08 (64.38)	1872.87 (64.31)
10	Rental value of land	902.40 (30.56)	970.74 (34.96)	1050.74 (34.61)	997.20 (34.25)
	Cost B	2816.36 (95.39)	2750.62 (99.06)	3004.82 (98.99)	2870.07 (98.56)
11	Family labour charges	136.11 (4.61)	26.03 (0.94)	30.71 (1.01)	41.83 (1.44)
	Cost C	2952.47 (100)	2776.65 (100)	3035.53 (100)	2911.90 (100)
12	Production				
	Main produce	2468.02 (21.67)*	2669.37 (25.43)*	3079.42 (28.37)*	2823.60 (26.25)*

* Average production in quintals

(contd.)

Figures in parentheses are percentages to total

Appendix II.4. continued

1	2	3	4	5	6
	By produce	2044.00	2184.35	2174.28	2162.40
	Per quintal cost of production	41.92	23.29	30.35	28.55
13	Value of total produce	4512.02	4853.72	5253.70	4986.00
14	Profit or loss at Cost C	1559.55	2077.07	2218.17	2074.10
15	Profit or loss at Cost B	1695.66	2103.10	2248.88	2115.93
16	Profit or loss at Cost A	2598.06	3073.84	3299.62	3113.13

Appendix II.5. Cost of cultivation of paddy prior to acquiring facility (in rupees)
Puncha - Local variety

Sl. No.	Items	Class II N=4	Class III N=6	Overall N=10
1	Hired human labour	742.50 (24.97)	870.73 (24.71)	819.44 (24.80)
2	Bullock labour	529.80 (17.82)	540.00 (15.32)	535.92 (16.22)
3	Seeds	299.50 (10.07)	304.50 (8.64)	302.50 (9.16)
4	Manures	140.50 (4.72)	112.68 (3.19)	123.81 (3.75)
5	Fertilizers	153.23 (5.15)	292.50 (8.30)	236.79 (7.17)
6	Irrigation	44.00 (1.48)	62.80 (1.78)	55.28 (1.67)
7	Crop protection	0	57.21 (1.62)	34.33 (1.04)
8	Depreciation, repairs and hiring of implements and machinery	0	22.50 (0.64)	13.50 (0.40)
9	Interest on working capital	76.38 (2.57)	90.51 (2.57)	84.86 (2.57)
	Cost A	1985.91 (66.79)	2353.43 (66.77)	2206.42 (66.78)
10	Rental value of land	987.20 (33.21)	1171.00 (33.23)	1097.48 (33.22)
	Cost B	2973.11 (100)	3524.43 (100)	3303.90 (100)
11	Family labour charges	0	0	0
	Cost C	2973.11 (100)	3524.43 (100)	3303.90 (100)
12	Production:			
	Main produce	2883.43 (22.65)*	3667.49 (30.36)*	3353.87 (27.28)*
	By produce	2052.56	2187.50	2133.52
	Per quintal cost of production	40.64	44.04	42.90
13	Value of total produce	4935.99	5854.99	5487.39
14	Profit or loss at Cost C	1962.88	2330.56	2183.49
15	Profit or loss at Cost B	1962.88	2330.56	2183.49
16	Profit or loss at Cost A	2950.08	3501.56	3280.97

* Average production in quintals

Figures in parentheses are percentages to total

Appendix II.6. Cost of cultivation of paddy after acquiring facility (in rupees)
Puncha - local variety

Sl. No.	Items	Class II N=4	Class III N=6	Overall N=10
1	Hired human labour	677.25 (23.30)	864.42 (25.18)	788.95 (24.50)
2	Bullock labour	289.50 (9.96)	114.63 (3.34)	184.58 (5.73)
3	Seeds	299.50 (10.30)	304.50 (8.88)	302.50 (9.40)
4	Manures	68.75 (2.37)	41.67 (1.21)	52.50 (1.63)
5	Fertilizers	283.23 (9.74)	458.61 (13.38)	388.46 (12.07)
6	Irrigation	76.50 (2.63)	20.83 (0.61)	43.10 (1.34)
7	Crop protection	75.00 (2.58)	102.08 (2.98)	91.25 (2.83)
8	Depreciation, repairs and hiring of implements	40.00 (1.38)	216.25 (6.31)	145.75 (4.53)
9	Interest on working capital	72.39 (2.49)	84.88 (2.48)	79.88 (2.48)
	Cost A	1882.12 (64.75)	2206.87 (64.37)	2076.97 (64.51)
10	Rental value of land	987.20 (33.96)	1221.35 (35.63)	1127.69 (35.02)
	Cost B	2868.32 (98.71)	3428.22 (100)	3204.66 (99.53)
11	Family labour charges	37.50 (1.29)	0.00	15.00 (0.47)
	Cost C	2906.82 (100)	3428.22 (100)	3219.66 (100)
12	Production - Main produce	2883.43 (22.65)*	3919.27 (32.66)*	3504.93 (28.66)*
	By produce	2052.56	2187.50	2133.52
	Per quintal cost of production	37.72	37.99	37.90
13	Total value of produce	4935.99	6106.77	5638.46
14	Profit or loss at Cost C	2029.17	2678.55	2418.80
15	Profit or loss at Cost B	2066.67	2678.55	2433.80
16	Profit or loss at Cost A	3053.87	3899.90	3561.49

* Average production in quintals. Figures in parentheses are percentages to total

Appendix II.7. Cost of cultivation of paddy prior to
acquiring facility (in rupees)

Virippu - High yielding variety

Sl.No.	Items	Class II N=2
1	Hired human labour	760.40 (18.27)
2	Bullock labour	400.00 (9.61)
3	Seeds	295.00 (7.08)
4	Manures	285.00 (6.85)
5	Fertilizers	420.48 (10.09)
6	Irrigation	0.00
7	Plant protection	532.04 (12.78)
8	Depreciation, repair and hiring of implements and machinery	0.00
9	Interest on working capital	107.72 (2.59)
	Cost A	2800.64 (67.27)
10	Rental value of land	1362.82 (32.73)
	Cost B	4163.46 (100)
11	Family labour charges	0.00
	Cost C	4163.46 (100)
12	Production - Main produce	5286.80 (44.05)*
	By produce	1527.32
	Per quintal cost of production	59.84
13	Value of total produce	6814.12
14	Profit or loss at cost C	2650.66
15	Profit or loss at cost B	2650.66
16	Profit or loss at cost A	4013.48

*Average production in quintals

Figures in parentheses are percentages to total

Appendix II.8. Cost of cultivation of paddy after acquiring facility (in rupees)

Virippu - High yielding variety

Sl.No.	Items	Class II N=2
1	Hired human labour	698.33 (16.08)
2	Bullock labour	
3	Seeds	295.00 (6.79)
4	Manures	0.00
5	Fertilizers	646.32 (14.89)
6	Irrigation	0.00
7	Plant protection	755.38 (17.40)
8	Depreciation, repairs and hiring of implements and machinery	515.38 (11.67)
9	Interest on working capital	116.42 (2.68)
	Cost A	3026.83 (69.71)
10	Rental value of land	1315.22 (30.29)
	Cost B	4342.05 (100)
11	Family labour charges	0.00
	Cost C	4342.05 (100)
12	Production - Main produce	5048.80 (43.99)*
	By produce	1527.32
	Per quintal cost of production	63.99
13	Value of total produce	6576.12
14	Profit or loss at cost C	2234.07
15	Profit or loss at cost B	2234.07
16	Profit or loss at cost A	3549.29

* Average production in quintals

Figures in parentheses are percentages to total

Appendix II.9. Cost of cultivation of paddy prior to
acquiring facility (in rupees)

Mundakan - High yielding variety

Sl. No.	Items	Class II N=2
1	Hired human labour	702.50 (15.55)
2	Bullock labour	398.80 (8.83)
3	Seeds	269.17 (5.96)
4	Manures	179.75 (3.98)
5	Fertilizers	582.18 (12.89)
6	Irrigation	633.89 (14.03)
7	Crop protection	129.35 (2.86)
8	Depreciation, repairs and hiring of implements and machinery	59.82 (1.32)
9	Interest on working capital	118.22 (2.62)
	Cost A	3073.68 (68.04)
10	Rental value of land	1443.88 (31.96)
	Cost B	4517.56 (100)
11	Family labour charges	0.00
	Cost C	4517.56 (100)
12	Production - Main produce	5392.89 (44.48)*
	By produce	1826.49
	Per quintal cost of production	60.50
13	Value of total produce	7219.38
14	Profit or loss at Cost C	2701.82
15	Profit or loss at Cost B	2701.82
16	Profit or loss at cost A	4145.70

*Average production in quintals

Figures in parentheses are percentages to total

Appendix II.10. Cost of cultivation of paddy after
acquiring facility (in rupees)

Mundakan - High yielding variety

Sl.No.	Items	Class II N=2
1	Hired human labour	752.25 (16.37)
2	Bullock labour	0.00
3	Seeds	269.17 (5.85)
4	Manures	0.00
5	Fertilizers	628.33 (13.67)
6	Irrigation	633.89 (13.79)
7	Crop protection	268.08 (5.83)
8	Depreciation, repair and hiring of implements and machinery	479.75 (10.44)
9	Interest on working capital	121.26 (2.64)
	Cost A	3152.73 (68.59)
10	Rental value of land	1443.88 (31.41)
	Cost B	4596.61 (100)
11	Family labour charges	0.00
	Cost C	4596.61 (100)
12	Production - Main produce	5392.89 (44.48)*
	By produce	1826.49
	Per quintal cost of production	62.28
13	Value of total produce	7219.38
14	Profit or loss at Cost C	2622.77
15	Profit or loss at Cost B	2622.77
16	Profit or loss at Cost A	4066.65

*Average production in quintals

Figures in parentheses are percentages to total

Appendix II.11. Cost of cultivation of paddy prior to acquiring facility (in rupees)
Puncha - High yielding variety

Sl. No.	Items	Class II N=5	Class III N=5	Overall N=10
1	Hired human labour	829.94 (18.71)	888.45 (17.31)	859.20 (17.96)
2	Bullock labour	441.50 (9.95)	462.80 (9.02)	452.15 (9.45)
3	Seeds	298.19 (6.72)	317.50 (6.18)	307.85 (6.43)
4	Manures	246.70 (5.56)	180.00 (3.51)	213.35 (4.46)
5	Fertilizers	627.31 (14.14)	634.53 (12.36)	630.92 (13.19)
6	Irrigation	271.44 (6.12)	420.50 (8.19)	345.97 (7.23)
7	Crop protection	450.50 (10.16)	400.90 (7.81)	425.70 (8.90)
8	Depreciation, repairs and hiring of implements and machinery	0.00	0.00	0.00
9	Interest on working capital	126.62 (2.86)	132.19 (2.58)	129.41 (2.70)
	Cost A	3292.20 (74.22)	3436.87 (66.95)	3364.54 (70.32)
10	Rental value of land	1143.40 (25.78)	1696.33 (33.05)	1419.87 (29.68)
	Cost B	4435.60 (100)	5133.20 (100)	4784.41 (100)
11	Family labour wharges	0.00	0.00	0.00
	Cost C	4435.60 (100)	5133.20 (100)	4784.41 (100)
12	Production - Main produce	4676.18 (48.01)*	7478.11 (69.70)*	6077.15 (58.86)*
	By produce	1040.82	1003.53	1022.18
	Per quintal cost of production	70.71	59.25	64.98
13	Value of total produce	5717.00	8481.64	7099.33
14	Profit or loss at cost C	1281.40	3348.44	2314.92
15	Profit or loss at cost B	1281.40	3348.44	2314.92
16	Profit or loss at cost A	2424.80	5044.77	3734.79

* Average production in quintals
Figures in parentheses are percentages to total

Appendix II.12. Cost of cultivation of paddy after acquiring facility (in rupees)
Puncha - High yielding variety

Sl. No.	Items	Class II N=5	Class III N=5	Overall N=10
1	Hired human labour	829.94 (17.23)	888.45 (16.37)	859.20 (16.77)
2	Bullock labour	391.69 (8.13)	254.85 (4.69)	323.27 (6.31)
3	Seeds	298.19 (6.19)	317.50 (5.85)	307.85 (6.01)
4	Manures	167.13 (3.47)	50.00 (0.92)	108.57 (2.12)
5	Fertilizers	650.60 (13.50)	702.60 (12.95)	676.60 (13.21)
6	Irrigation	271.44 (5.63)	420.50 (7.75)	345.97 (6.76)
7	Crop protection	725.44 (15.06)	754.63 (13.90)	740.04 (14.45)
8	Depreciation, repairs and hiring of implements and machinery	142.88 (2.97)	167.00 (3.08)	154.94 (3.02)
9	Interest on working capital	139.09 (2.89)	142.22 (2.62)	140.66 (2.75)
	Cost A	3616.40 (75.07)	3697.75 (68.13)	3657.08 (71.41)
10	Rental value of land	1174.72 (24.39)	1729.82 (31.87)	1452.27 (28.35)
	Cost B	4791.12 (99.46)	5427.57 (100)	5109.35 (99.75)
11	Family labour charges	26.03 (0.54)	0	13.02 (0.25)
	Cost C	4817.12 (100)	5427.57 (100)	5122.37 (100)
12	Production:			
	Main produce	4832.79 (49.62)*	7645.55 (71.26)*	6239.17 (60.44)*
	By produce	1040.82	1003.53	1022.18
	Per quintal cost of production	76.11	62.08	69.10
13	Value of total produce	5873.61	8649.08	7261.35
14	Profit or loss at Cost C	1056.46	3221.51	2138.98
15	Profit or loss at Cost B	1082.49	3221.51	2152.00
16	Profit or loss at Cost A	2257.21	4951.33	3604.27

* Average production in quintals

Figures in parentheses are percentages to total

Appendix II.13. Per hectare cost of cultivation of coconut prior to acquiring facility (in rupees)

Sl. No.	Items	Class I N=27	Class II N=40	Class III N=28	Overall N=95
1	Hired human labour	1182.85 (21.93)	1056.22 (17.48)	1702.00 (22.67)	1282.54 (20.39)
2	Manures	1112.40 (20.63)	1180.78 (19.54)	1280.80 (17.06)	1190.84 (18.93)
3	Fertilizers	0.00	304.00 (5.04)	716.00 (9.53)	339.03 (5.39)
4	Irrigation	119.46 (2.21)	455.70 (7.54)	283.21 (3.77)	309.30 (4.92)
5	Plant protection	0.00	0.00	0.00	0.00
6	Interest on working capital	289.77 (5.37)	359.60 (5.95)	477.84 (6.36)	374.61 (5.96)
	Cost A	2704.48 (50.14)	3356.30 (55.55)	4459.85 (59.39)	3496.32 (55.59)
7	Rental value of land	2598.87 (48.19)	2685.44 (44.45)	3048.96 (40.61)	2767.98 (44.00)
	Cost B	5303.35 (98.32)	6041.74 (100)	7508.81 (100)	6264.30 (99.59)
8	Family labour charges	90.21 (1.67)	0.00	0.00	25.64 (0.41)
	Cost C	5393.56 (100)	6041.74 (100)	7508.81 (100)	6289.94 (100)
9	Production				
	Main produce	10883.84	11679.20	13534.00	11999.83
	By produce	2110.50	1748.00	1710.80	1840.06
10	Value of total produce	12994.34	13427.20	15244.80	13839.89
11	Profit or loss at cost C	7600.78	7385.46	7735.99	7549.95
12	Profit or loss at cost B	7690.99	7385.46	7735.99	7575.59
13	Profit or loss at cost A	10289.86	10070.90	10784.95	10343.57

Figures in parentheses are percentages to total

Appendix II.14. Per hectare cost of cultivation of coconut
after acquiring facility (in rupees)

Sl. No.	Items	Class I N=27	Class II N=40	Class III N=28	Overall N=95
1	Hired human labour	1107.01 (19.49)	1056.22 (16.03)	1732.00 (21.37)	1269.83 (18.73)
2	Manures	1112.45 (19.58)	1180.78 (17.92)	1280.80 (15.81)	1190.84 (17.57)
3	Fertilizers	0.00	489.03 (7.42)	716.00 (8.84)	416.94 (6.15)
4	Irrigation	343.02 (6.04)	280.64 (4.26)	170.00 (2.09)	265.76 (3.93)
5	Plant protection	37.14 (0.65)	130.64 (1.97)	118.00 (1.46)	100.34 (1.48)
6	Interest on working capital	311.95 (5.49)	376.48 (5.71)	482.02 (5.95)	389.25 (5.74)
	Cost A	2911.57 (51.25)	3513.79 (53.31)	4498.82 (55.52)	3632.96 (53.60)
7	Rental value of land	2622.01 (46.16)	2989.60 (45.36)	3582.16 (44.21)	3059.80 (45.14)
	Cost B	5533.58 (97.41)	6503.39 (98.67)	8080.98 (99.73)	6692.76 (98.74)
8	Family labour charges	147.12 (2.59)	87.47 (1.33)	22.00 (0.27)	85.13 (1.26)
	Cost C	5680.70 (100)	6590.86 (100)	8102.98 (100)	6777.89 (100)
9	Production:				
	Main produce	11000.00	13200.00	16200.00	13458.95
	By produce	2110.50	1748.00	1710.80	1840.06
10	Value of total produce	13110.50	14948.00	17910.80	15299.01
11	Profit or loss at Cost C	7429.80	8357.14	9807.82	8521.12
12	Profit or loss at Cost B	7576.92	8444.61	9819.82	8606.25
13	Profit or loss at Cost A	10198.93	11434.21	13411.98	11666.05

Figures in parentheses are percentages to total

Appendix II.15. Per hectare cost of cultivation of Arecanut prior to acquiring facility (in rupees)

Sl. No.	Items	Class I N=19	Class II N=25	Class III N=21	Overall N=65
1	Hired human labour	1274.05 (22.03)	990.44 (9.85)	1031.25 (12.32)	1086.53 (13.42)
2	Manures	2268.39 (39.23)	4059.71 (40.38)	3299.29 (39.40)	3290.42 (40.64)
3	Fertilizers	0.00	538.40 (5.35)	624.82 (7.46)	408.94 (5.05)
4	Irrigation	127.83 (2.21)	1241.95 (12.35)	746.13 (8.91)	756.10 (9.34)
5	Plant protection	0.00	0.00	0.00	0.00
6	Interest on working capital	440.43 (7.62)	819.66 (8.15)	684.18 (8.17)	655.04 (8.09)
	Cost A	4110.70 (71.09)	7650.16 (76.08)	6385.67 (76.26)	6197.03 (76.54)
7	Rental value of land	1489.96 (25.77)	2312.50 (23.00)	1987.50 (23.74)	1810.30 (22.36)
	Cost B	5600.66 (96.86)	9962.66 (99.08)	8373.17 (100)	8007.33 (98.90)
8	Family labour charges	182.00 (3.14)	92.81 (0.92)	0.00	89.18 (1.10)
	Cost C	5782.66 (100)	10055.47 (100)	8373.17 (100)	8096.51 (100)
9	Production				
	Value of produce	7449.80	11562.50	9937.50	9051.48
10	Profit or loss at Cost C	1667.14	1507.03	1564.33	954.97
11	Profit or loss at Cost B	1849.14	1599.84	1564.33	1044.15
12	Profit or loss at Cost A	3339.10	3912.34	3551.83	3628.31

Figures in parentheses are percentages to total

Appendix II.16. Per hectare cost of cultivation of Arecanut
after acquiring facility (in rupees)

Sl. No.	Items	Class I N=19	Class II N=25	Class III N=21	Overall N=65
1	Hired human labour	816.08 (13.50)	905.63 (8.93)	1031.25 (11.94)	920.04 (10.88)
2	Manures	2268.39 (37.55)	4059.71 (40.03)	3299.29 (38.21)	3290.42 (38.90)
3	Fertilizers	0.00	806.80 (7.96)	803.39 (9.30)	569.86 (6.74)
4	Irrigation	527.82 (8.74)	707.88 (6.98)	505.65 (5.85)	589.91 (6.98)
5	Crop protection	0.00	0.00	0.00	0.00
6	Interest on working capital	433.47 (7.18)	777.60 (7.67)	676.75 (7.83)	644.43 (7.62)
	Cost A	4045.76 (66.97)	7257.62 (71.57)	6316.33 (73.12)	6014.66 (71.12)
7	Rental value of land	1750.70 (28.98)	2688.57 (26.51)	2139.88 (24.77)	2237.15 (26.45)
	Cost B	5796.46 (95.95)	9946.19 (98.08)	8456.21 (97.89)	8251.81 (97.57)
8	Family labour charges	244.74 (4.05)	194.75 (1.92)	182.02 (2.11)	205.25 (2.43)
	Cost C	6041.20 (100)	10140.94 (100)	8638.23 (100)	3457.06 (100)
9	Production:				
	Value of produce	8753.50	13442.83	10699.40	11185.76
10	Profit or loss at Cost C	2712.3	3301.89	2061.17	2728.70
11	Profit or loss at Cost B	2957.04	3496.64	2243.19	2933.95
12	Profit or loss at Cost A	4725.80	6217.61	3831.47	5010.64

Figures in parentheses are percentages to total

Appendix II.17. Cost of cultivation of Banana after
acquiring facility (in rupees)

Sl. No.	Items	Class I N=12	Class II N=19	Class III N=18	Overall N=49
1	Hired human labour	2287.04 (11.84)	2605.00 (11.18)	3329.17 (12.57)	2797.15 (11.89)
2	Suckers	2100.00 (10.87)	2625.00 (11.27)	2204.86 (8.32)	2342.09 (9.97)
3	Manures	1291.67 (6.69)	1683.21 (7.23)	1352.37 (6.99)	1649.46 (7.02)
4	Fertilizers	3333.33 (17.25)	4292.90 (18.43)	4402.11 (16.62)	4098.02 (17.44)
5	Irrigation	1358.03 (7.03)	1109.09 (4.76)	1119.38 (4.23)	1173.83 (5.00)
6	Crop protection	0.00	975.00 (4.19)	1037.50 (3.92)	759.18 (3.23)
7	Miscellaneous	1250.00 (6.47)	1257.62 (5.40)	2138.89 (8.07)	1579.49 (6.72)
8	Interest on working capital	1394.41 (7.21)	1745.74 (7.49)	1930.11 (7.28)	1727.43 (7.35)
	Cost A	13014.48 (67.36)	16293.56 (69.95)	18014.39 (68.00)	16122.65 (68.62)
9	Rental value of land	5707.30 (29.54)	6524.67 (28.01)	8054.06 (30.40)	6886.32 (29.31)
	Cost B	18721.78 (96.90)	22818.23 (97.96)	26068.45 (98.40)	23008.97 (97.93)
10	Family labour charges	600.00 (3.10)	475.00 (2.04)	425.14 (1.60)	487.30 (2.07)
	Cost C	19321.78 (100)	23293.23 (100)	26493.59 (100)	23496.27 (100)
11	Production:				
	Main produce	24026.53	28568.63	35240.80	29907.28
	By produce	4509.98	4054.74	5029.49	4524.30
12	Value of total produce	28536.51	32623.37	40270.29	34431.58
13	Profit or loss at Cost C	9214.73	9330.14	13776.70	10935.31
14	Profit or loss at Cost B	9814.73	9805.14	14201.84	11422.61
15	Profit or loss at Cost A	15222.03	16329.81	22255.90	18308.93

Figures in parentheses are percentages to total

IMPACT OF BANK FINANCE FOR MINOR IRRIGATION IN TRICHUR DISTRICT

By

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ABSTRACT OF A THESIS

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ABSTRACT

A study was conducted in Trichur district to assess the impact of bank finance for minor irrigation in the district. The objectives were to find out the characteristics of the borrowing farmers, the improvements in farming practices, changes in yield rates and output and the income and employment generated by irrigation development with banks' assistance.

Relevant data were collected from a sample of ninety-eight beneficiaries of finance for minor irrigation of the Lead Bank, viz., the Canara Bank, by personal interview using a pre-structured schedule.

Majority of the beneficiaries belonged to forward castes and had a literacy of 89.23%. The average family size of the sample was 7. Seventy of them had holdings of size less than a hectare. All of them had fairly good family income, eventhough the income from farming was lower than Rs.5000/- per annum in as many as 32 cases. Consumption pattern of the beneficiaries showed them to be enjoying a reasonably good standard of living.

The cropping intensity of the sample increased from 122.74% to 134.91% following irrigation development. The area under coconut, arecanut and banana increased, while that

under paddy decreased in all size classes following irrigation development. The dose of organic manure added to all the crops decreased in the post-investment period, whereas that of chemical fertilizers increased, even though it continued to be lower than the recommendations.

The production and productivity changes in coconut due to irrigation development were 24.07 per cent and 30.2 per cent respectively. There was an accompanying increase in income also. The farm business income, family labour income and net income from all the crops increased in the post-investment period. The employment generation of the scheme was, however, negative. The employment of hired human and bullock labour declined significantly in all the size groups of beneficiaries, while that of family labour and the use of machinery increased.

Majority of the pumpsets acquired were 3 H.P. pumpsets. This indicated considerable mismatch between area operated and H.P. of the facility acquired. Delay in energization and drying up of the wells in summer made timely repayment difficult. However, there was no case of overdues among the sample. The loan was found to have generated sufficient repayment capacity in all the size groups of beneficiaries, even though it was not economically feasible in size groups I and II.