SOCIO-ECONOMIC STUDY OF FARMERS IN OLLUKKARA BLOCK IN THE COMMAND AREA OF PEECHI IRRIGATION PROJECT

By

K. VENKATESWARA RAO

THESIS

Submitted in partial fulfilment of the
requirement for the Degree of

Master of Science in Agriculture

Faculty of Agriculture
Kerala Agricultural University

Department of Agricultural Economics

COLLEGE OF HORTICULTURE

Vellanikkara - Trichur

1982

DECLARATION

I hereby declare that this thesis entitled "Socio-Economic study of farmers in Ollukkara Block in the Command Area of Peechi Irrigation Project" is a bonafide record of research work done by me during the course of research work and this thesis has not previously formed the basis for the award to me of any degree, diploma, associateship, fellowship or other similar title of any other University or Society.

5/11/1982
Vellanikkara,

K. Venkateswara Rao

K. VENKATESWARA RAO

CERTIFICATE

It is certified that this thesis entitled "Socio-Economic study of farmers in Ollukkara Block in the Command Area of Peechi Irrigation Project" is a record of research work done independently by Shri. K. Venkateswara Rao under my guidance and supervision and that it has not previously formed the basis for the award of any degree, fellowship or associateship to him.

Dr. V. Radhakrishnan,
Professor & Head,
Department of Agricultural Economics.

Vellanikkara,
Nov. 5 /1982

CERTIFICATE

We, the undersigned members of the Advisory Committee of Shri. K. Venkateswara Rao a candidate for the degree of Master of Science in Agriculture with major in Agricultural Economics agree that the thesis entitled "Socio-Economic study of farmers in Ollukkara Block in the Command Area of Peechi Irrigation Project may be submitted by Shri. K. Venkateswara Rao in partial fulfilment of the requirements for the degree.

Dr. V. Radhakrishnan,
Chairman,
Advisory Committee.

Shri.D.V. Rajendran,
Member

Shri. V.K.G. Unnithan,
Member

Shri. K.P.R. Nair,
Member.

ACKNOWLEDGEMENTS

I take this opportunity to record my deep sense of gratitude to Dr. V. Radhakrishnan, Chairman of the Advisory Committee, Professor and Head, Department of Agricultural Economics for his valuable guidance, keen interest, inspiration, constructive criticism and tireless help throughout the study as well as in the preparation of this thesis.

I acknowledge with gratitude, the valuable suggestions and critical comments offered by other members of the Advisory Committee Sri. D.V. Rajendran, Assistant Professor, Department of Agricultural Economics; Sri. V.K.G. Unnithan, Associate Professor, Department of Agricultural Statistics and Sri. K.P. Ramachandran Nair, Associate Professor, Department of Agricultural Extension.

I am grateful to Sri. P.A. Rappai, Block Development Officer, Ollukkara Block for giving necessary information.

I am grateful to all post-graduate students and undergraduate students who helped in survey work. The help of Sri. R.K.Chatterjee, M.Sc.(Hort.) is gratefully acknowledged.

I am also grateful to my parents whose love, and constant inspiration made me to fulfil this endeavour.

(K. VENKATESWARA RAO)

CONTENTS

LIST OF TABLES

Introduction

INTRODUCTION

Rural development and prosperity through irrigation has been a dominant theme in Indian planning since the beginning of the era of planned economic development. The importance of irrigation as an essential input for agricultural development hardly needs any emphasis. The new Agricultural technology consisting of high yielding variety seeds, fertilizers and other inputs which have raised hopes for an ultimate solution to our chronic agricultural production problem are all primarily dependent on the availability of irrigation. According to B.P. Singh (1974) irrigation explains 54 per cent of the total variance in agricultural production for India as a whole, and if Gujarat and Rajasthan are excluded, the variance explained by irrigation goes upto about 70 per cent. Aside from making scientific practices feasible and thereby increasing productivity of crops per unit area, irrigation also helps agricultural production by increasing the area under cultivation. Much of the fallow and oultural waste land, for example can be brought under cultivation and multiple cropping can replace single cropping, if irrigation is available.

Though irrigation is practised since ancient times, only 25 per cent of the net cultivated area in the country is irrigated in 1976-77. A quick glance at our irrigation

statistics show that in 1951-52 only 18 per cent of our total cropped area was irrigated. The percentage went up very slightly to about 22 per oent and 25 per cent in 1969-70 and in 1976-77 respectively. The estimated potential for irrigation in the country is about 110 million hectares which is roughly 50 per cent of the potential gross sown area in the country.

In the oase of Kerala the percentage of gross irrigated area to total cropped area (1976-77) was 24.2 and net irrigated area as percentage of net area sown (1975-76) was 10.[1] Agriculture in Kerala is primarily depending on rainfall which is regular and distributed well from June to November. Kerala receives a total rainfall of 3003.8 mm during this period[2]. But the period between December and May is dry. This has a retarding effect on cropping pattern as well as on yields, where even supplementary irrigation facilities are not existing. Therefore major as well as the minor irrigation works were undertaken to provide irrigation facilities to supplement the rain.

It is estimated that Rs.9282 crores has been invested in major and minor irrigation projects in the country till the end of fifth Five year plan. It is necessary to have a macro look at these efforts for ascertaining the fact whether the created irrigation potential at very high cost is being

1 & 2. Farm Guide 1981 pp. 32.

properly utilized. But the studies of the Irrigation Commission (1969-72) and the National Commission on Agriculture (1972) have highlighted the deficiencies in the efficient use of irrigation facilities on farm as well as in the water delivery system. Based on the recommendations of the two commissions, in order to utilize the irrigation potential efficiently separate organisations for planning, co-ordinating and implementing the plans was therefore set up for various irrigation projects, which came to be known as Command Area Development Authority. In Kerala for Malampuzha, Peechi and Chalakudy projects, the Command Area Development Authority was formed in 1978 and started functioning in the same year.

Need and Role of Command Area Development Authority

The various steps which have been considered necessary for prompt and efficient utilization of irrigation potential created encompass the activities of a number of individual Government Departments like Irrigation, Agriculture, Revenue, Co-operation, besides those of banking, marketing and input service organisations and no single department would be in a position to provide all the requisite arrangements. It is only by a close inter-disciplinary and inter-departmental approach that the measures required for prompt and efficient use of irrigation facilities can be ensured. Such an approach known as command area approach has been introduced in some

major irrigation projects by constituting special administrative agencies for this purpose. By 1980 there were 40 such authorities functioning covering over 50 irrigation projects located in 12 states. They are part of integrated rural development programme.

Command area development programme seeks to accelerate the process of utilization of irrigation potential and to improve the efficiency of utilization through a multidisciplinary approach. The ultimate objectives are securing of maximum yields per unit of water or per unit of land as the case may be, depending on the availability of water and the soil and climatological factors in a particular basin. It also aims at enabling the farmer not only to secure maximum production but also to get the maximum economic benefit by proper and timely disposal of his produce through adequate facilities like communications, markets and processing industries.

But the actual programme will vary from project to project and state to state depending on the developments that have already taken place and other relevant factors. Broadly the development authorities will devote particular attention to the on-farm development works comprising land levelling and land shaping operations, field channels, field drains, topographical and soil surveys, preparation of on-farm

development plans and supervision of their execution as well as strengthening of existing extension training and demonstration organisations.

The functions of the command area authority can be separated into the following unit programmes.

1. Modernisation and efficient operation of irrigation systems.
2. Development of main drainage system and its improvement
3. Development of field channel and field drainage systems within the farmers block under each delivery head so as to minimise water losses, water logging and proper water distribution.
4. Land shaping of water shed area in the command
5. Exploitation of ground water to supplement the surface water
6. Fixing and enforcing of suitable cropping schedule according to the availability of water
7. Preparing a plan of input supply for credit, seeds, fertilizers, tractors and plant protection services
8. Arranging input supply and services
9. Planning and arranging the necessary marketing, transporting and processing facilities.

10. Preparing individual programmes of action for small farmers, marginal farmers and agricultural labourers.

11. Preparation and implementation of master plan.

Organisation of Command Area Development Authority

The CADA in Kerala was initiated in 1978 with its headquarters at Trichur. Headed by a special officer for the project, experts from disciplines of agriculture engineering, soil survey, soil conservation, co-operation and statistics were withdrawn from respective departments to enable assistance. Project period is 10 years and is implemented as a centrally sponsored scheme. The financial commitments are shared both by Central and State governments equally for activities like establishment of authority, land development works and soil survey. Expenses for infrastructure developments are to be met by State governments.

There is a governing body consisting of heads of departments and peoples' representatives which decides the annual programme of work and review the progress of implementation.

Need for socio-economic survey in a command area

It is observed that the introduction of irrigation is associated with the changes in the cropping pattern. The subsistence agriculture under rainfed condition is changed

into a commercial farming with the introduction of irrigation. Because of regular supply of water, the farm inputs as well as the capital use in agriculture increases with the consequent positive results on crop yields and income from agriculture.

The socio-economic survey in the area estimates and depicts the level of economic status of the farmers and farm economy at a point of time. It is a picture of the economic and social conditions at a particular period. It helps the command area authority, in the task of command area development by providing information on the essential features of the farm economy in the region. Needless to say, it also helps to provide a benchmark against which developments in future can be assessed.

The dimensions of a technique or a set of techniques for socio-economic study should include two important aspects.

a) A quantitative measurement of farm output, costs, income and employment.

b) Economic and social setting within which these various enterprises are carried out. These consist of infrastructure development and people's social conditions and their attitudes.

The first aspect includes the quantitative measurement of various resources with the farm families, the manner in

which these resources are being used in different crop and livestock enterprises and cost and return structure, from these enterprises. Such analysis will indicate the level of income of the farm families and the extent of employment both farm and non-farm available to the rural working population.

The second aspect covers the infrastructure development which consists of facilities available such as agricultural credit, agricultural marketing, transport, education development activities including research and extension.

Objectives of the present study

Peechi irrigation project command area covers three blocks in Trichur taluk. The present study is limited to Ollukkara block, which will give a close look on the socio-economic conditions of the farmers in the region. This survey as a bench-mark study to throw light on various aspects such as economic position, availability and utilization of water and the problems faced by the cultivators.

It is felt that socio-economic research of command area development would, oneside, document the various aspects of the progress and at the same time provide an insight for irrigation development planning. The socio-economic survey of an area is neither an end in itself nor in itself is the objective but the ultimate goal is the evaluation of the rural plan. With this view the socio-economic survey in the Peechi Command

Area in Ollukkara Block is carried out with the following specific objectives.

1. To study the methods and practices followed for cultivation.
2. To assess the availability and use of resources.
3. Cost and income structure of the farm business.
4. Savings, Investment, Assets and Debts.
5. General social and economic conditions - education, consumption pattern, standard of living, etc.
6. To study the infrastructural facilities available.

The objectives of the study are sought to be realized through information obtained from a sample of selected farmers in the Block supplemented by available secondary data.

This thesis consists of eight chapters inclusive of the present one. The second chapter deals with the relevant literature, the third chapter deals with materials and methods. The fourth chapter contains a description of the study area. The fifth chapter deals with the general conditions on sample farms. The sixth chapter examining the farm business structure and the seventh chapter deals with household economy of the sample farms. A summary of the main findings of the study is presented in the eighth chapter.

Review of Literature

REVIEW OF LITERATURE

The present study on socio-economic conditions of farmers in Ollukkara block in the command area of Peechi irrigation project covers various aspects such as general economic and social conditions, economics of different agricultural enterprises and the problems faced by the cultivators in the area. The literature surveyed here covers these aspects, viz., general socio-economic studies in command areas, economics of crop and livestock enterprises and income, savings and consumption of the farm families.

1. General socio-economic studies in command areas

Anand (1960) in his study on the Chambal valley project stressed the need for other facilities and services to the farmers, like cheap credit, adequate supply of inputs, provision for soil conservation, drainage, extension service and setting up of agro-based industries along with the supply of irrigation water.

Desai (1973) in his study compared two regions of Baroda, one region having assured irrigation facilities with another having uncertain irrigation and stressed the importance of irrigation. He concluded that uncertain irrigation causes uneconomic use of labour and sub-optimum use of fertilizers

and manures and in regions with assured irrigation facilities farmers maximised the net returns.

Wade's study (1975) revealed that Command Area development programme which has become one of the main components of Indian agricultural policy cuts across administrative boundaries and existing practices, and that the success or failure of the programme mainly depends on 3 issues viz., alternative approaches to land development and consolidation, the effect of rational irrigation both on aggregate output and on the income of poor farms and the role of water associations on which research is going on.

Desai's (1977) study explained the importance of non-price variables such as irrigation, wealth (a proxy for risk) on crop pattern of a set of farmers in Surat district. The results showed that increasing the availability of net irrigable land would shift the crop pattern in favour of more remuneration and also labour intensive crops such as sugarcane, banana, HYV paddy. The shift would in turn increase the net income of an average farmer.

Pathak et al. (1977) in their study on Kadana Command Area, revealed that the introduction of canal irrigation is envisaged to change the cropping pattern and improve agricultural practices, leading to an improvement in the economic conditions of the beneficiary and the need for strengthening co-operative structure to meet farmer's farm input need was emphasized.

Sisodia (1977) in his bench-mark socio-economic survey of Chambal Command Area compared farms of command area with farms in non-command area and revealed that the extent of land holding and quality of land possessed, area irrigated and intensity of cropping on non-irrigated farms were inferior to those of command area. The cropping pattern of command farms struck a better balance between food grains and cash crops unlike the greater orientation to food grains, especially cereals in non-command farms. The net surplus was higher in the case of command area farmers.

Singh (1977-78) in his study of the utilization of irrigation potential in major and medium irrigation projects pointed out that against the potential area to be irrigated there was a gap which accounted upto 98% in different projects. The reasons were irregular supply of water due to faulty systems, non-existence of proper drainage system, inadequacy of infrastructure and inputs and wastage of water caused by practice of field to field irrigation. He stated that command area development strategy will help to overcome these defects.

Khuspe (1979) in his study on Mula Project command area revealed that more than half of the farmers in the selected sample were not utilizing the canal irrigation water to the full extent because of non-availability of credit, heavy costs involved in repairs of field channels, lack of intimation

about letting out of irrigation water, faulty constructions and lack of proper repairs and non-availability of inputs at right time.

Suryawanshi et al. (1980) revealed in their study that there was a definite impact of command area development on cropping pattern, crop yields and also income levels of the farmers. There were also positive changes in the cropping pattern and utilization of input levels. After establishing CADA, the benefit cost ratio increased to more than 2 and all crops showed a tremendous increase in productivity.

Bagi (1981) in his study on economics of irrigation in crop production in Haryana revealed that the technical change introduced by irrigation was non-neutral (i.e., factor-biased) and there was evidence that technical efficiency was higher in irrigated farms.

Naidu et al. (1981) studied the inverse relationship between farm size and crop intensity and also between farm size and labour use. The study revealed that the inverse relation between variables under study not only disappeared but turned positive. The possible explanation for the former is the greater interest evinced by the large farmers in using land more intensively in the wake of higher profitability offered by the new technology and for the latter the need for timely application of modern inputs.

2. Economics of crop and livestock enterprises

Singh (1966) in his study on cost of cultivation in relation to holding size in Punjab and Haryana revealed that there is an increasing trend in output per acre with increase in holding size. Similarly human and bullock labour inputs decreased with increase in holding size and consequently cost per acre decreased.

Kahlon et al. (1973) observed that there was no relationship between the size of the farm and maintenance cost of cows.

Chawla (1975) in his study in Amritsar to analyse the crop plans of the small farms compared to others and to work out per hectare expenditure on modern inputs on the small farms as compared to other categories of farms, showed that the small farms did not apply the recommended fertilizers and irrigation due to high prices and ignorance while other farms reported difficulties with regard to power supply.

George and Srivastava (1975) selected 4 villages from Baroda district during 1972 and found that dairying could be used as an effective means for increasing the income position of the rural poor if adequate finance linked with extension and marketing facilities were provided.

Lavania et al. (1975) studied 60 farms from 5 villages in Varanasi district and found that with increasing size of

farms the average feed costs per cow and buffalo also increased whereas the proportion of value of green fodder to the total feed value declined with increase in the size of farms and that of dry fodder increased.

Rathore et al. (1975) in their study on economy of small farms in Udaipur district of Rajasthan revealed that labour use was greater in irrigated farms so also under employment. This leads to a suggestion to take up subsidiary occupation.

Singh and Yadav (1975) reported that 80% of the cost on inputs accounted by three factors viz., human labour (20 per cent), bullock labour (21 per cent) and rental value (38 per cent). Manures and fertilizers accounted for almost the same proportion in different types of holdings.

Singh et al. (1975) in his study on cropping pattern employment and income of small farmers revealed that the percentage of area under food crops decreased as the farm size of holding increased. Input, output and net income per farm showed an increasing trend with an increase in the size of holdings mainly because of higher cropping intensity and higher expenditure on cash inputs.

Mangala Bhanu (1977) in his report on command area development of Peechi, Chalakudy and Malampuzha irrigation

projects revealed that the cropping intensity in Peechi command area was 168.42 per cent and average size of holding was 0.68 ha. He also revealed that fertilizer use was far less than the recommended levels and yield of HYV paddy in the area was 3180 kg/ha and that of local varieties 2315 kg/ha during 1976-77.

Palaniswamy and Rajagopalan (1977) studied the pattern of employment of family, permanent and casual labour in different size groups of farms and found that there was no variation in the employment of casual labour. The family labour input was more in small-farms whereas it was the permanent or casual labour on large farms. The total labour input per unit area decreased as the size of farm increased.

Raghupathy et al. (1977) found that coconut production under regular cultivation and manuring was more profitable than grown as intercrop under neglect.

Patil et al. (1978) in their study on Girna Command Area reported that the per hectare labour units required for paddy (irrigated) cultivation was 232.96 male labour hours and 386.08 female labour hours. By and large small holding size groups used more labour.

They reported that per hectare labour units required for banana were 1235.68 male labour hours and 411.36 female hours. The input of female labour decreased with increase in the holding size.

They reported that the seed rate for paddy used was slightly more than the recommended level and farmers in the small holding size groups and large holding size group had used excess seed rate which indicated that there existed a wide gap in the technological diffusion.

They reported that the fertilizer application for paddy (irrigated) in the Girna command area was far lower than the recommended levels. The average nitrogen, phosphorus and potassium applied for paddy were 62 kg/ha, 16 kg/ha and 8 kg/ha respectively as against the recommended levels of 100 kg nitrogen, 62 kg phosphorus and 50 kg potassium in the same order.

They revealed that in the case of banana also there was a wide gap between the applied level of fertilizers and the recommended levels. The applied level of N, P, K were 199 kg/ha, 72 kg/ha and 55 kg/ha respectively against the recommended levels of N 600 kg/ha, P 300 kg/ha and K 400 kg/ha.

They also reported that the cost of cultivation of paddy (irrigated) in the study area was Rs.1865.47/ha, of which 7 per cent was on hired human labour, 10.17 per cent on bullock labour, 8.55 per cent on seeds, 9.5 per cent on manures and 9.78 per cent on fertilizers. The cost of cultivation of banana was Rs.7492.97/ha, of which 6 per cent was on hired human labour, 6.4 per cent on seeds and 8.58 per cent on manures and 22.42 per cent on fertilizers.

Mishra and Vivekananda (1979) in their study on impact of canal irrigation in Bellary district revealed that irrigation was a very important factor for the utilization of land in farming. The intensity of land use was lower in the large farms than in the small farms. Cropping intensity decreased with increase in holding size.

They also revealed that in the study area, the average yield of paddy was 17.02 quintal/acre where perennial irrigation facilities were present and 14.09 quintal/acre where supplementary irrigation facilities were available. The yield per acre of paddy was higher under small farms than under large holdings in the wet villages (irrigated) but in the perennially irrigated villages it was just the reverse.

Bal et al. (1980) studied to work out costs and returns from milch animals and contribution of dairy business income to total farm business income in Punjab state. The average number of milch animals per farm increased with size of holding and dairy business contribution to total farm business decreased. But they pointed out that in terms of benefit-cost ratio, crop production was more profitable.

Balishter and Singh (1980) for their study selected 90 farmers at random from Agra district during 1978-79 and found that the number of milch animals per farm increased with size of farm while it declined on per hectare basis.

Patil et al. (1980) in their study on socio-economic conditions in Ghod command area revealed that the per hectare labour utilization in paddy (irrigated) was 321.2 male labour hours and 356.56 female labour hours. The hired female labour used was more than the family female labour while the utilization of family male labour was higher in the smaller holding size groups.

They also revealed that the fertilizer application for irrigated paddy in the study area was very much lower than the recommended levels. The average quantity of nutrients applied was 53.37 kg/ha of nitrogen, 2.08 kg/ha of phosphorus and 2.08 kg/ha of potassium, against the recommended quantities of 100 kg/ha of nitrogen, 62 kg/ha of phosphorus and 50 kg/ha of potassium.

Singh (1980) revealed that dairying is profitable and farmers can easily earn additional one and half to two thousand rupees per annum through integration of milch animals besides crop production but this is small amout for large farmers but for small farmers it is a handsome gain. Additional income and additional employment were also observed.

Singh et al. (1980) revealed that of the average gross farm income and expenses of Rs.4991.22 and Rs.3553.88, the livestock production contributed 28.57 per cent to total family inoome and 29.48 per cent to total expenses. The

per cent contribution made to total farm income, expenses and employment by livestock was higher on small farms as compared to large sized farms.

Radhakrishnan et al. (1981) reported that the cost of cultivation of paddy during 1978-79 in Trichur district was Rs.2240.34/ha excluding rental value of land for HYV paddy. The expenditure on animal labour accounted for Rs.325, on human labour Rs.573, on seeds for Rs.259, on manures Rs.232, on fertilizers Rs.488 and on pesticides Rs.132. The total cost of cultivation of traditional variety paddy in Trichur district was Rs.1905/ha excluding rental value of land.

They reported that at total cost excluding rental value cost per quintal of grain production in Trichur district was Rs.80 for HYV paddy and Rs.107 for T.V. paddy. Benefit-cost ratio was 1.32 for HYV paddy and 1.12 for T.V. paddy at the total cost excluding rental value of land.

Radhakrishnan et al. (1981) reported that the total cost of cultivation of HYV paddy in Trichur district during 1979-80 was Rs.2248.89/ha excluding rental value of the land. Of this Rs.482.88 was on preparation of land , Rs.210.56 on seeds, Rs.106.83 on manures, Rs.456.36 on fertilizers and Rs.124.24 on pesticides. The total cost of cultivation of traditional varieties of paddy in Trichur district was Rs.1938/ha excluding rental value of land. Of this Rs.604 was

on preparatory cultivation, Rs. 266 on seeds, Rs.272 on manures, Rs.94 on fertilizers and Rs.11 on pesticides.

They also reported that yield of paddy (HYV) in Trichur district during 1979-80 was 31.64 quintal/ha and that of traditional varieties 16.04 quintal/ha. The cost per quintal of paddy at total cost excluding rental value of land was Rs.53 in the case of HYV paddy and Rs.94 for T.V. paddy. The benefit cost ratio at the same cost was 1.64 for HYV paddy and 1.14 for T.V. paddy.

Rao, E.H. (1981) in his study on production and marketing of milk in Trichur district revealed that 83 per cent of the holdings were less than one hectare and they accounted for 39 per cent of the total area operated. Leasing in or out was practically absent.

The study also revealed that 51 per cent of the gross cropped area was under paddy and cropping intensity was 152 per cent which was exclusively due to raising more than one paddy crop. The milch animals per households were 1.33.

3. Income savings and consumption

Deole et al. (1972) attempted to determine the distribution of farm income and income from other sources and the expenditure on crop production and family consumption and to estimate savings per holding in the command area of Purna project in Parbhani district. The study revealed that in

regard to the non-beneficiaries, crop production accounted for about 68 per cent of the gross annual income per holding. Income from wages was about 17 per cent and from livestock and other sources was meagre. In case of beneficiaries crop production accounted for about 76 per cent of the gross income per holding, the contribution of livestock, wages and other sources was about 24 per cent of the gross income. The holdings below 10 acres showed negative savings.

Garg and Srivastava (1972) studied the impact of modern farm technology on income, Savings and investment. The income from crops formed major part of gross income. The income from crops showed an increasing tendency with increase in farm size the reason being adoption of high yielding varieties. Investment on new inputs like seeds, fertilizers, irrigation, machinery etc. increased with increase in the size of farm. The study also showed that the net savings was 6.73 per cent of the total gross income.

Kahlon et al. (1972) showed that owing to the adoption of new technology farmer's gross income in Ludhiana increased almost 50 per cent in 1970-71 over 1966-67.

The study also showed that farm family expenditure rose sharply whereas savings decreased. The main reason for the decline in savings was that these farm families made heavy investment in building the infrastructure upto 1969-70 and thereafter spent more on household expenditure.

Miglani et al. (1972) studied disparities in income (absolute increase in income) in different holding size groups and concluded that the income inequality was least in the case of 15-20 hectares holding size group and maximum in the case of 20 hectares and above group. Farmers having more irrigational facility earned higher profits.

Nandal (1972) studied pattern of income investment expenditure and savings of selected farms in Haryana and revealed that both absolute and the relative income gains have tended to increase with the increase in the size of holding level of mechanisation, formal education of the head of the family and the number of earners in the family. This variation in socio-economic factors seemed to accentuate inter-regional and intra-regional income imbalances which might involve serious socio-political implications.

Chawla et al. (1975) revealed that the income from farm production varied positively with the farm size and expenditure of household also varied positively. Food expenditure accounted for maximum proportion of the total expenditure. They also revealed that of the total expenditure, food items accounted for maximum expenditure followed by clothing, lighting, housing, medicines and education. The expenditure on food items varied inversely with the farm size indicating thereby the prevalence of diversification of food habits. The expenditure on all items except food varied positively with farm size.

Ram Iqbal Singh et al. (1975) analysed the income and expenditure at the family level to work out the investible surplus and the pattern of investment in agriculture and net saving as available for mobilisation. The analysis revealed the family income consisted of income from crop production, wages and salaries, milk production and sale of livestock, income from hiring out machinery, etc. The annual income per family, the per family annual consumption and expenditure on all goods and services changed positively with holding size. The study also revealed that leaving aside two lowest income groups where income was less than consumption, the investible surplus increased with increase in the size of holdings but the plow back to agriculture decreased with the increase in size of holding.

Patil et al. (1980) studied family expenditure pattern in Ghod command area, and reported that the average per adult expenditure was Rs.1146.44. More than fifty per cent of it was on food, 14 per cent on clothes, 3.67 per cent on education, 3.57 per cent on housing, 3.89 per cent on recreation and 4.37 per cent on medicine.

Sidhu et al. (1980) studied the annual domestic expenditure per farm family in various size groups in different zones of Punjab and revealed that the average domestic expenditure per family was Rs.11919.28 per annum, whereas in the

small farms per family domestic expenditure was Rs.9634.92, on medium farms Rs.12590.66 and on large farms Rs.17010.75.

They also revealed that the per head expenditure on small farms was Rs.1322.44, on medium farms Rs.1466.53, on large farms Rs.1675.11 and the average per head expenditure was Rs.1450.22.

Suryawanshi (1980) in his study revealed that even in assured irrigated area a substantial gap existed in the credit requirements of the farms and credit supplied by the existing financial institutions. Small farmers have still to depend on the money lenders as a major source of credit. In the case of small farmers it was higher than large farmers. Institutions contributed little to weaker agriculture section.

Materials and Methods

MATERIALS AND METHODS

The present study attempts to analyse the socio-economic conditions of farmers in Ollukkara block of command area of Peechi Irrigation Project. The method of farming and economic conditions in a region largely depend on the agro-climatic factors like soil topography, rainfall, temperature and economic factors like availability of land sources of irrigation and facilities for input supply and product marketing. Of the above factors irrigation will have considerable impact on the agricultural economy of the region. The Peechi Irrigation Project covers 5396.233 hectares of area in this block which is 31 per cent of the total area under project. The present study is restricted only to this part of the command area to have a closer look on the socio-economic conditions of farmers.

Sampling procedure

The sampling design of the study is two stage random sampling with wards in the entire block as the primary sampling unit and households within the ward as the secondary unit.

All Panchayat wards in the block were arranged alphabetically and five wards in the block were selected randomly. The selected wards were Mannuthy, Nadathara, Pattikad, Chirakkakode and Pamboor. From each of these wards 20 cultivator households were selected randomly. For selecting farm

households from ward, the household register of the Panchayat was taken as sampling frame. Total households and households surveyed in the selected panchayat wards of Ollukkara are given in Table 3.1.

Period of the study

The study covered the agriculture year 1980-81 and data collection was completed during the months of March-April of 1982.

Collection of data

Farm level data were collected from the respondents by personal interview method with a set of schedules, specially designed for the purpose (Appendix I). Information relating to general socio-economic conditions, cropping patterns followed, cost of cultivation details of crops and asset position of the respondents was collected for the reference year.

Secondary data were collected from published and unpublished sources on land utilization, rainfall, temperature, population and infrastructural facilities pertaining to the study area including the general features of the Peechi project and command area.

Tools of analysis

The data collected from the households were first

tabulated and then classified into four groups according to the size of holding as well as household gross income.

Classification according to size of holding is given below.

1. Smallest holding size group - owning land upto 1 acre
2. Small holding size group - owning land between 1 and 2 acres
3. Medium holding size group - owning land between 2 and 3 acres
4. Large holding size group - owning land more than 3 acres.

Classification according to the annual gross income of the household was done as given below.

1. Lowest income group - Gross income of the household upto Rs.15000/- per annum
2. Lower income group - Gross income of the household between Rs.15000/- and Rs.25000/- per annum
3. Middle income group - Gross income of the household between Rs.25000/- and Rs.35000/- per annum
4. High income group - Gross income of the household above Rs.35000/- per annum.

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

Population of the surveyed households was classified into four groups as given below to study the composition of

population for male and female population separately under different holding size groups and income groups.

1. Children in the age group of 1-5 years
2. Children in the age group of 6-14 years
3. Adults in the age group of 15-60 years
4. Adults in the age group of over 60 years

Population of the surveyed households was also classified according to their education level.

Concepts and definitions used in the study

1. Human labour

a) Family labour - It consists of actual work carried out by family members for crop production. For the purpose of cost calculations this labour has been valued on the basis of prevailing rates paid to the hired labour.

b) Hired labour - This category consisted of the hired casual labour employed in crop production. The payment made in cash or kind has been considered. In the present study eight hour of work per day by man was considered as a manday unit and eight hour of work per day by woman was considered as a womanday unit.

2. Bullock labour

Owned bullock labour has been accounted as per the rates of hired bullock labour prevailing in the locality.

Four hour of work by a pair of bullocks per day was considered as a bullock pair day.

3. Seeds, manures, fertilizers and pesticides

Home produced seeds and manures have been evaluated at the prevalent village prices while purchased seeds, manures and fertilizers have been evaluated at the actual prices paid.

4. Irrigation charges and cess

Irrigation charges included the irrigation charges paid to the irrigation department for the use of canal water. In the case of well irrigation actual charges paid for fuel or electric power used were considered.

5. Land rent

The rental value of the owned land has been considered as one-fifth of the value of gross produce of the respective crop.

6. Interest on working capital

For working out cost of cultivation, interest was charged at the rate of 12 per cent per annum for 4 months in the case of seasonal crops and 12 months in the case of other crops.

7. Interest on fixed capital

Interest was charged at the rate of 10.25 per cent on the value of implements, machinery and farm sheds etc. This

interest charges were allocated to individual crops in proportion to the area under each crop.

8. Depreciation

Depreciation was calculated by the straight line method at the rate of 5 per cent in the case of farm sheds. In the case of implements the rate of depreciation were calculated at 15 per cent. Minor repairs were directly added to the depreciation charges. In the case of pumpsets, the rate of depreciation was calculated at 5 per cent.

9. Cost concepts used

The analysis of cost of cultivation was carried out by using different cost concepts i.e., cost A, B and C. These three costs include items as follows.

Cost A

This cost covers items such as

i) value of hired human labour
ii) value of hired bullock labour
iii) value of owned bullock labour
iv) value of seeds (farm produced and purchased)
v) value of manures and fertilizers
vi) irrigation expenditure
vii) crop protection expenditure
viii) depreciation on implements, machinery, farm sheds, etc.
ix) interest on working capital

Cost B

This cost includes

Cost A + Rental value of owned land + Interest on fixed capital

Cost C

This cost includes Cost B + Imputed value of family labour.

Harvesting charges were also included in the cost of cultivation. Harvesting charges were taken as one-sixth of the main product in the case of paddy.

10. Measures of income

Gross income of the household - The total gross income obtained from all sources has been considered as gross income of the household. This include gross income from all crops on the farm (Products and Byproducts), service, business, livestock and other sources.

11. Farm business analysis

It has been carried out by using different measures of income as given below.

a) Gross income - Values of main product and byproduct were calculated at the prevailing rates in the area at the time of harvest (including produce used for home consumption) or the actual receipts from the sale of product were considered.

b) Farm business income - The difference between gross income and cost A represents the farm business income of the cultivators.

c) Family labour income - The difference between gross income and cost B represents the income of the cultivators on account of his own and family labour.

d) Net income - The difference between the gross income and cost C represents the net return for the farm enterprise.

12. Cost of production of main product

Paddy crop consists of two saleable commodities viz., grain and fodder or byproduct. The cost of main product is obtained by subtracting value of byproduct from cost C. It facilitates working out the cost per quintal of the main produce.

13. Cropping intensity

Cropping intensity is calculated as percentage ratio between gross cropped area to net cropped area.

14. Output-input ratio

The output-input ratios at various cost concepts were worked for different crops; on the basis of above defined income concepts.

15. Adult consumption units

For calculating the consumption units for studying the family expenditure the adult units were calculated on the basis of the equivalence shown in Table 3.2.

16. Household expenditure

a) Food - This includes the cost of cereals, pulses and other articles which form a part of the daily diet of the cultivator household members.

b) Fuel - This consists of fire wood, kerosene and other products of the farm and electricity which are used for this purpose.

c) Clothing and foot wear - This includes the expenditure on clothes of every day use and those of special occasions.

d) Housing - The expenditure under this includes interest and depreciation on the value of the dwellings. It also includes the cost of alterations and repairs to the residential houses. Interest has been assessed at the rate of 10.25 per cent per annum on the present value. Depreciation has been charged at the rate of 2 per cent for pucca houses and 5 per cent for kachha houses.

e) Beverages - The expenditure on coffee and tea has been accounted separately.

f) Education - The actual amount paid as fees for children, expenditure on stationery, school dress has been accounted under this group.

g) The expenditure on travel, recreation and alcohol have been accounted separately.

17. Dairy animals

a) Operational costs - Operational costs included costs on feed, labour and veterinary charges.

b) Gross income - This consisted of income from milk produced and dung.

c) Current income - Gross income minus operational costs

d) Valuation of inputs

i) Feeds - Feeds have been classified into roughages and concentrates. The price paid by the producer was used for valuation of purchased feeds and for home supplied feeds market rates were used.

ii) Veterinary charges - These included the fee paid to technicians towards insemination and expenses incurred in purchasing medicines. For computing this cost the actual cost incurred by the producer was used.

iii) Upkeep charges - Labour charges both family and hired are accounted on the actual number of hours of work and at actual rates of payment.

Table 3.1. Total households, households surveyed in the selected panchayat wards of Ollukkara block

Sl. No.	Name of the ward	Total number of households	Number of households surveyed
1	Mannuthy	525	20
2	Nadathara	633	20
3	Pattikad	422	20
4	Chirakkakode	351	20
5	Pamboor	388	20
	Total	2319	100

Table 3.2. Equivalent adult units for different age groups (conversion factors)

Age groups	Adult consumption unit coefficient
Adult male	1.00
Adult female	0.90
Adolescent boys and girls (13-21 years)	1.00
Children (9-12 years)	0.80
Children (7-8 years)	0.70
Children (5-6 years)	0.60
Children (3-4 years)	0.50
Children (1-2 years)	0.40

Source: 'Ourfood' by M.Swaminathan and R.K. Bhagavan (1972).

Area of Study

AREA OF STUDY

Agricultural production is very much dependent up on the climate and geographical conditions such as temperature, rainfall, soil, etc. These are the basic factors which determine production, income and type of farming. Besides the natural factors, economic factors such as population structure, which determines the labour force, availability of land, livestock position, investment in fixed assets like implements and machinery influence the efficiency in farming, but are also largely responsible in bringing about the desirable changes in the farm economy.

Ollukkara block is situated in the central part of the Trichur taluk between 10^{0} 29'-10^{0} 35' N latitude and 76^{0} 13'-76^{0} 20' E longitude. This block is bounded by Talappilly taluk, Trichur town, Mukundapuram, Wadakkancherry and Ollur blocks of Trichur district and Alathur taluk of Palghat district (Fig. 1). The block has a net work of roads. The National Highway (NH 47) passes through the block and is connected by rail. The total area of the block is 189.16 KM^{2} with a population of 1.59 lakhs (1971).

Topography of the block area is mostly hilly and terraced. Laterite and lateritic loamy soils are the usual type met with, except in valleys. Due to this and also as because the canals are running along the contour in half

cutting and half filling, the seepage loss is reported to be large. The soils in the region are also clayey loams and acidic in nature. The nitrogen, phosphorus and potassium content in the soil in two Intensive Paddy Development Units in Ollukkara block are given in Table 4.1.

The maximum temperature recorded in Ollukkara block was 37.12°C and minimum temperature was 20.3°C during 1981-82. Rainy season starts in the fourth week of May, or early June and lasts upto November combining South-West and North-East monsoons. It is followed by a dry season till April-May. In the months of April and May, a few showers are received, which are known as premonsoon showers. Monthwise,rainfall recorded at Ollukkara station for the years 1972-76 is given in Table 4.2.

In this chapter the economic characteristics such as population, availability of land, livestock and farm machinery available with farmers in the area are discussed.

Population in the block

Ollukkara block which is under the command area of Peechi Irrigation Project consists of seven panchayats viz., Ollukkara, Panancherry, Kolazhy, Madakkathara, Nadathara, Vilvattam and Puthur. The population and occupational distribution thereof under different panchayats of the Ollukkara block during 1971 are given in the Tables 4.3 and 4.4.

Table 4.1. Soil fertility status in different IPD units in the Ollukkara block

Name of IPD unit	Year of commencement	Area in hectares	Soil fertility status		
			N	P	K
Panancherry	1975-76	2,157	1.70	1.58	1.61
Puthur	1973-74	1,137	1.89	1.79	1.41

Source: CADA Report (1977) pp. 124

Inference: 1. Soil - Acidic
2. N - Medium
P - Medium
K - Low

Table 4.2. Rain guage readings at Ollukkara Station in the ayacut of Peechi Irrigation Project for the years 1972-76 (in mm)

Month	1972	1973	1974	1975	1976
January	-	-	-	-	-
February	2.4	-	1.4	-	-
March	-	-	6.0	82.8	4.6
April	17.3	50.0	98.4	98.6	104.8
May	518.8	80.0	165.6	256.9	75.9
June	377.7	559.2	380.8	838.5	203.2
July	657.4	545.6	1065.7	562.4	852.6
August	432.9	425.6	539.9	768.3	375.6
September	222.4	25.3	365.0	553.4	111.5
October	269.0	270.7	81.1	361.9	154.7
November	76.6	22.8	39.6	245.4	203.5
December	215.0	31.4	-	-	1.6
Total	2789.5	2010.6	2743.5	3768.2	2088.0

Source: CADA Project Report (1977) pp. 124.

Among the panchayats Panancherry comes first in terms of population as well as in number of households while Madakkathara stands the last. The proportion of male population in all these panchayats ranged from 48.9 to 50.6 per cent while that of female ranged from 49.4 to 51.1 per cent. It can be observed that the proportion of the female in the total population was 50.4 per cent which was slightly greater than 1:1 female male ratio. The dominance of female population which is a characteristic of Kerala is observed in all Panchayats except in Panancherry and Vilvattam. The density of population in the block was 844 per KM^2 (1971).

The proportion of Scheduled Caste population was the highest to the extent of 12.02 per cent in Puthur panchayat, while it was the lowest (6%) in Ollukkara panchayat. The proportion of Scheduled Tribes population was the highest (1.75%) in Panancherry. Scheduled Tribe population was absent in Ollukkara, Vilvattam, Kolazhy and Madakkathara panchayats.

In all the panchayats the literacy percentage was more than 62 in case of males. It ranged from 62.54 to 72.74 per cent. In the case of females the literacy percentage ranged from 49.92 to 64.45. Ollukkara panchayat was the most literate in terms of both male and female literacy.

Table 4.3. Panchayatwise population in the Ollukkara block of Peechi command area in 1971

Particulars	Panchayats							Total
	Ollukkara	Panan-cherry	Vilvattam	Kolazhy	Nadathara	Puthur	Madakkathara	
Number of households	4398	4772	3975	2608	3169	4021	2413	25356
Total population	28336 (100.00)	28628 (100.00)	25312 (100.00)	16725 (100.00)	19983 (100.00)	25522 (100.00)	15178 (100.00	159682 (100.00)
a) Total male	13954 (49.2)	14405 (50.3)	12814 (50.6)	8175 (48.9)	9806 (49.1)	12524 (49.1)	7468 (49.2)	79146 (49.6)
b) Total female	14382 (50.8)	14223 (49.7)	12498 (49.4)	8548 (51.1)	10177 (50.9)	12998 (50.9)	7710 (50.8)	80536 (50.4)
Scheduled caste	1714 (6.0)	2389 (8.34)	2329 (9.2)	1321 (7,9)	1538 (7.7)	3068 (12.02)	1302 (8.58)	13661 (8.56)
Scheduled tribe	-	501 (1.75)	-	-	89 (0.45)	137 (0.54)	-	727 (0.46)
Literate and educated								
a) Male	10150 (72.74)	9009 (62.54)	8907 (69.51)	5782 (70.73)	6677 (68.09)	7878 (62.9)	4227 (56.6)	52630 (66.5)
b) Female	9269 (64.45)	7507 (52.78)	7548 (60.39)	5484 (64.16)	5794 (56.93)	6489 (49.92)	4146 (43.77)	46237 (57.41)
Total literate	19419 (68.53)	16516 (57.69)	16455 (65.01)	11266 (67.37)	12471 (62.41)	14367 (56.29)	8373 (55.17)	98867 (61.91)

Figures in the parentheses are percentage to total

Source: District census handbook, Trichur (1971)

Table 4.4. Occupational distribution of population in the Panchayats of Ollukkara block of Peechi command area in 1971

Items	Panchayats							Total
	Ollukkara	Panan-cherry	Vilvattam	Kolazhy	Nadathara	Puthur	Madakka-thara	
1	2	3	4	5	6	7	8	9
Total male	13954 (100.00)	14405 (100.00)	12814 (100.00)	8175 (100.00)	9806 (100.00)	12524 (100.00)	7468 (100.00)	79146 (100.00)
Total female	14382 (100.00)	14223 (100.00)	12498 (100.00)	8548 (100.00)	10177 (100.00)	12998 (100.00)	7710 (100.00)	80536 (100.00)
Total workers								
Male	5867 (42.05)	6536 (45.37)	5379 (41.98)	3385 (41.4)	4264 (43.4)	5630 (44.95)	3194 (42.77)	34255 (43.28)
Female	1810 (12.59)	3132 (22.02)	1986 (15.89)	1356 (15.86)	1811 (17.8)	2580 (19.85)	1636 (21.2)	14311 (17.77)
Cultivators								
Male	438 (3.14)	1809 (12.56)	341 (2.66)	578 (7.07)	754 (7.69)	1269 (10.13)	832 (11.14)	6021 (7.61)
Female	50 (0.35)	155 (1.09)	58 (0.46)	140 (1.64)	112 (1.1)	233 (1.79)	183 (2.37)	931 (1.16)
Agricultural labourers								
Male	885 (6.34)	3014 (20.92)	509 (3.97)	680 (6.32)	983 (10.02)	1816 (14.5)	1223 (16.38)	9110 (11.51)
Female	736 (5.12)	2569 (18.06)	709 (5.67)	755 (8.83)	944 (9.28)	1644 (12.65)	1177 (15.27)	8534 (10.60)

(contd.)

Table 4.4. continued

1	2	3	4	5	6	7	8	9
Livestock, Forestry, Fisheries, Plantation, Orchards, etc.								
Male	113 (0.81)	303 (2.1)	132 (1.03)	41 (0.50)	96 (0.98)	86 (0.69)	250 (3.35)	1021 (1.29)
Female	18 (0.13)	30 (0.21)	21 (0.17)	11 (0.13)	34 (0.33)	9 (0.07)	46 (0.6)	169 (0.21)
Trade and commerce								
Male	1275 (9.14)	320 (2.22)	655 (5.11)	488 (5.97)	482 (4.92)	405 (3.23)	190 (2.54)	3815 (4.82)
Female	77 (0.54)	34 (0.24)	99 (0.79)	36 (0.42)	51 (0.5)	32 (0.25)	15 (0.19)	344 (0.43)
Other services								
Male	3156 (22.62)	1090 (7.57)	3742 (29.2)	1598 (19.55)	1949 (19.88)	2054 (16.4)	699 (9.36)	14288 (16.05)
Female	929 (6.46)	344 (2.42)	1099 (8.79)	414 (4.84)	670 (6.58)	662 (5.09)	215 (2.79)	4333 (5.38)
Nonworkers								
Male	8087 (57.95)	7869 (54.63)	7435 (58.02)	4790 (58.59)	5542 (56.52)	6894 (55.05)	4274 (57.23)	44891 (56.72)
Female	12572 (87.41)	11091 (77.98)	10512 (84.11)	7192 (84.14)	8366 (82.2),	10418 (80.15)	6074 (78.76)	66225 (82.23)

Figures in parenthesis show percentage to total

Source: Census handbook, Trichur (1971)

On an average only 43 per cent of the total male population and 17.7 per cent of the female population were categorised as workers. Of the total male population 11.51 per cent and 10.6 per cent of female population were categorised as agricultural labourers.

Land utilization in the study area

The pattern of land use is one of the important indicators of the state of economy of an area. There are various factors such as social, political and economic which influence the land use pattern and as a result, it continuously undergoes change. The information on land use pattern in the block is given in the Table 4.5. It can be seen from the table that only 9.83 per cent of the total area was under forest. The net sown area in the block was as high as 69.78 per cent. Area not available for cultivation was 9.17 per cent and current fallows accounted for 6.21 per cent of the total area.

Irrigation sources in the study area

The land is irrigated by different sources such as Peechi canals, wells, tanks and private tube wells. Peechi canals were covering an area of 5396.24 ha, private tube wells 1100 ha, other wells 3000 ha and tanks 650 ha. About sixtyone per cent of the irrigated area in the block was

Table 4.5. Land use pattern in Ollukkara block

Items	Area in hectares	Percentage to total
1. Geographical area	18916	100.00
2. Total reporting area	18280	96.64
3. Area under forest	1860	9.83
4. Area not available for cultivation	1735	9.17
5. Other uncultivable area	310	1.64
6. Current fallow	1175	6.21
7. Net cultivated area	13200	69.78

Source: Block Development Office, Ollukkara

covered by Peechi canals and 34.1 per cent by other sources. The canal water is supplied mainly to paddy lands.

Cropping pattern

The choice and combination of crops grown by the individual cultivators depend on several factors. It primarily depends on the soil and climate, farmer's requirement of food and fodder, markets and prices, etc. The availability of labour, capital and irrigation also influence the cropping pattern to a great extent. In addition to these the farmer takes into account the need to maintain soil fertility and probable uncertainties and risk of crop failure due to vagaries of monsoon, occurrence of pests and diseases, unpredictable fall in prices of commodities, etc. For individual cultivator the selection and combination of crops from this point of view is, therefore, of crucial importance in farming.

The cropping pattern of a region is generally referred to the area under different crops grown in the region. The present cropping pattern was more or less traditional but based on several years experience in farming after considering the suitability of crops to be grown in relation to the agro-climatic conditions in the region. The details of the cropping pattern in the study area are given in Table 4.6. It can be seen that paddy occupied 68.09 per cent of the total cropped area. The important plantation crops in the area are

Table 4.6. Cropping pattern in Ollukkara block

Crops	Area in hectares	Percentage to total
1. Paddy	11041	68.09
2. Coconut	1858	11.46
3. Arecanut	1742	10.74
4. Banana	800	4.93
5. Vegetables	180	1.11
6. Others	595	3.67
7. Net cropped area	13200	-
8. Gross cropped area	16216	100.00
9. Area cropped more than once	3016	-
10. Net irrigated area	8797	-
11. Double/multiple cropped area	7394	-
12. Cropping intensity (percentage)	122.85	-

Source: Block Development Office, Ollukkara

coconut and arecanut and they cover 11.46 per cent and 10.74 per cent respectively of the cropped area. Banana covered 4.93 per cent of the cropped area. The area cropped more than once was 3016 ha and net cropped area was 13200 ha. The net area irrigated was 8797 ha. This is 66.64 per cent of the net sown area. The cropping intensity in the area was 122.85 per cent.

Size of holding in the area

The total agriculture land holdings in the area were 18230. Size of the holding has got its influence on farm business. So, it will be relevant to study the distribution of holdings according to size. The distribution of the holdings according to the size is given in Table 4.7. About 45 per cent of the holdings were in the group of less than one hectare and 41.79 per cent of the holdings were in 1-2 hectares size group.

Availability of farm machinery in the area

As most of the holdings in the area were less than 2 hectares, farmers prefer to hire machinery rather than owning them. There were 15 tractors and 20 powertillers in the area which were available for hiring. There were 640 oil engines and 2100 electric pumpsets working in the area for irrigation purpose.

Table 4.7. Distribution of holdings according to size of holding

Size of holding	Number of holdings	Percentage to total
Less than 1 hectare	8232	45.16
1-2 hectares	7618	41.79
3-10 hectares	1860	10.20
10 and above	520	2.85
Total	18230	100.00

Source: Block Development Office, Ollukkara

Table 4.8. Livestock position in the block

Type of animal	Number	Percentage to total
1. Work animals (1250 pairs)	2500	32.98
2. Dairy		
a) Buffaloes		22.56
i) Cross bred	510	6.73
ii) Others	1200	15.83
b) Cows		20.05
i) Cross bred	620	8.18
ii) Others	900	11.87
3. Goats, Pigs, etc.	1850	24.41
Total livestock	7580	100.00
4. Poultry	125000	-

Source: Block Development Office, Ollukkara.

Livestock population

The position of livestock population in the block is presented in the Table 4.8. Of the total livestock in the block 22.56 per cent were she-buffaloes and 20.05 per cent were cows, coming under the category of dairy animals. Work animals contributed 32.98 per cent of the total livestock. However, the work animal pairs were 1250 which was hardly 6.86 per cent of the total number of holdings. Around 24.41 per cent of the total livestock was goats, pigs, etc.

Infrastructure

Agricultural development is not only determined by the economising behaviour of farmers, but also by the economic setting within which farmers operate. They are physical, climatic, socio-cultural and institutional in nature. The term, infrastructure in a broad sense inoludes the development of law and order, education, public health, transportation, communication, power, water supply, irrigation, agricultural research, extension, banking, credit, etc. The major components of infrastructure facilities available in the study area are given below.

a. Agricultural credit

The facilities for agricultural credit play a vital role in the process of agricultural development. Farming as

a business needs large amount of capital. Majority of the farmers do not have enough capital of their own. The necessity of credit for agriculture development need hardly any emphasis. Farmers need credit for various purposes such as to meet the cultivation expenses, purchase of cattle, imple ments and raw materials to improve land by irrigation and drainage, to pay old debts, to build and repair houses, to purchase food and other personal necessities.

Agricultural credit is supplied by various agencies such as Service Co-operative Banks, Land Development Banks, Commercial Banks, Government and private agencies.

In the study area there are 5 State Bank associated branches. There are also two agricultural development branches, namely State Bank of Travancore (ADB), Trichur and Bank of Baroda operating in the study area. There are 18 Service Co-operative Banks (primary agricultural credit societies) to cater to the requirements of short term and medium term agricultural credit. There are more than one hundred registered private money lenders in the block supplying credit. Some loans are also issued at block level by Government through Block Development Officer and also at Panchayat level. Land Development Bank of Trichur is also supplying long term credit to the farmers. Non-nationalized Commercial Banks like Dhanalakshmi Bank Ltd., and Catholic Syrian Bank Ltd. are also supplying agricultural credit. Thus the infrastructural

facilities to meet the banking and credit needs of farmers in the area appear to be well endowed for.

b. Marketing

As the size of holding in the area is very small, the marketable surplus will be very low in the case of paddy which is an important crop in terms of area. Even though each village and panchayat is having markets, farmers selling paddy directly to consumers was the common practice. During harvest of the viruppu crop, there is the problem of drying of paddy as harvest coincides with the monsoon. Druing unfavourable situation the farmer resorts to distress sale to processing units or to dealers who have better facilities to dry and store.

Wherever banana is grown as a monocrop, farmers generally take the produce to Trichur market where it is generally sold for a remunerative price. But when it is grown as an intercrop in the coconut gardens, the quantity being low the produce is sold in the local village market or to consumers direct in which case the realization is said to be low.

Coconut and arecanut are sold to contractors or brokers in the field itself. Some farmers take their produce to Trichur market also. In the case of cashewnut, Government co-operative societies in each village collect it. Institutionalised marketing facilities for agricultural products

have not developed in the study area, partly due to proximity of Trichur market and partly due to the low volume of surplus of most products.

The supply of inputs like fertilizers, pesticides, livestock feed, poultry feed, etc. is done by Service Co-operative Banks at village level who supply them at a reasonable price to farmers. They also supply consumer goods.

c. Extension education services

For implementing extension education programmes adequate arrangements exist. The command area authority has also a separate extension service cell at Trichur for imparting knowledge of improved agricultural practices to the farmers.

The Lab to Land programme of ICAR is implemented in the following villages namely, Ollukkara, Kozhukully, Panancherry and Madakkathara through the Kerala Agricultural University. The main objective of the programme is to increase the productivity on farms and provide full employment and better standard of living. Another important objective is to develop strong feed back mechanism which could enable the laboratories to come in close contact with the problems and needs of the farmers and to identify the constraints in adoption of the new technology. Under the Lab to Land programme, meetings, mini exhibitions, demonstrations, etc.

were conducted and even HYV seeds, fertilizers and pesticides are distributed free of cost to the selected farmers. The marginal and small farmers, agricultural labour and harijans are the beneficiary.

For paddy development in the region, two Intensive Paddy Development (IPD) units are working. In each IPD unit one demonstration plot is laid out in the farmer's field to show about irrigation channels, drainage, application of fertilizers, pesticides, etc. for HYV paddy. Agricultural Department gives subsidy of Rs.1000/- per hectare for raising HYV paddy nursery in the demonstration farm.

d. Agricultural Research

Agricultural Research and Experiment Stations and laboratories play an important role in the development of agriculture. The Kerala Agricultural University headquarters is located in the Ollukkara block. The following units of the University are also located in Ollukkara block.

1. College of Horticulture, Vellanikkara
2. College of Veterinary and Animal Sciences, Mannuthy
3. Banana Research Station, Kannara
4. Pineapple Research Centre, Vellanikkara
5. Cashewnut Research Station, Madakkathara.

e. Crop and animal care

The crop and animal care are equally important activities

in the development of agriculture. This is being taken care of by the Government. At panchayat level Junior Agriculture Officer assists the farmers through demonstrations in crop protection and care. In the case of paddy IPD units assist farmers in crop care. As already stated two IPD units are working in the block.

For animal care Veterinary dispensaries,and Key village centres are working in the block. Even the Veterinary College assists in special cases. There are 5 Key village centres and 3 veterinary dispensaries in the block.

f. Soil conservation and land improvement

Apart from preventing soil erosion soil conservation helps in increasing the water holding capacity of soil and improves its structure and texture. Under the CADA at Trichur a soil conservation unit is functioning to carry out the soil conservation programme in the area.

No systematic soil survey has been conducted in the ayacut to determine the suitable soil conservation measures needed and to determine the most suitable cropping pattern. It is understood that proposal for a detailed survey of the command has been made by Agriculture Department which is pending with the Government. The work will have to be expedited.

g. Education and health

Every village in the block is having primary school facilities and each panchayat is having one high school. There are 6 nursery schools, 24 primary schools, 18 secondary schools and 7 high schools in the block. There is one Basic Training School running in the block. There is one full-fledged college in Viyyur panchayat of the block. Higher educational institutions in Trichur town are within the reach of students from the block. Another interesting point to be noted here is that all professional colleges in Trichur district are in this block. Kerala Agricultural University with Horticulture College and College of Veterinary and Animals Sciences, Trichur Medical College and Government Engineering College are also located within this block.

Availability of medical aid is of primary importance. The present medical facilities in the block are satisfactory. Two primary health centres, 5 Key village centres, 3 maternary and child welfare centres, 3 Family welfare centres, 17 Ayurvedic dispensaries, 9 Homoeopathic dispensaries, one Allopathic hospital and 4 Allopathic dispensaries are working in the block. District Hospital, Trichur and Jubilee Mission Hospital, Trichur are within a distance of 20 KM from any part of the block.

h. Irrigation and drinking water facilities

The total area irrigated in Ollukkara block from all

sources was 8797 ha in 1980-81, of which 1100 ha by private tube wells, other wells 3000 ha, tanks 650 ha and Peechi project 5396.23 ha in the block.

In most of the villages in the block, the main source for drinking water is well. Tap water is also available in some places of the block which are close to the Trichur town. Even use of canal water for drinking was observed.

i. Transport and communication

This includes roads, rail roads, post and telegraph, etc. The National Highway No. 47 is passing through the block. Most villages are connected by kutcha roads. It is generally observed that most of the village roads are not in good condition. The total length of metallic roads in the block is 14.5 KM, nonmetallic roads 30 KM and kutcha roads 50 KM. A 5 KM railway track is passing through the block. State Road Transport as well as private city buses and route buses are running in the block connecting all the villages.

The number of post offices in the block are 42 and telegraph offices 3. Telephone service in the block is within the Trichur town service.

j, Processing facilities

Ollukkara block is industrially underdeveloped. The

surplus raw agricultural produce like arecanut, coconut, pepper, rubber and cashew are transported to the different processing centres in the district. No other agro-based industry is situated in the block except two oil ghanis.

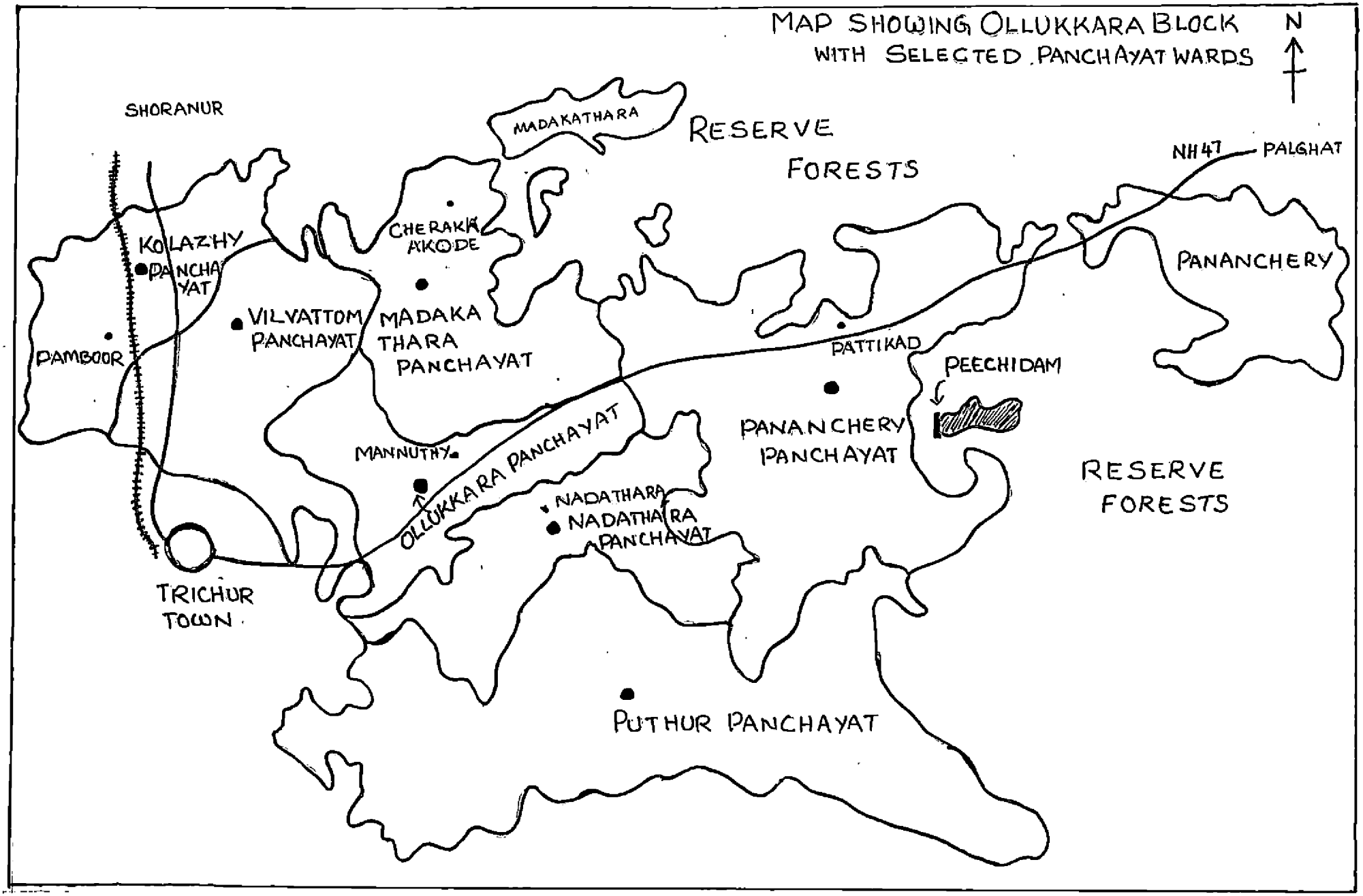
k. Electricity supply

The supply of electricity is one of the most important items on which agricultural and industrial development is based. In Ollukkara block all the 20 villages are electrified. Priority is given for agricultural needs in giving new service connections. Out of the 2740 irrigation pumpsets working in the block, 2100 are electrical.

l. Recreation

Recreation is also an important item to develop social and cultural aspects of the community. There are 4 film theatres in the block. Recreation can also be had through radio.

From the brief account of the infrastructure facilities available in Ollukkara block, it can be concluded that in terms of infrastructure facilities the block is fairly well endowed with.


MAP SHOWING OLLUKKARA BLOCK
WITH SELECTED PANCHAYAT WARDS
N
SHORANUR
MADAKATHARA
RESERVE
FORESTS
NH 47
PALGHAT
KOLAZHY
PANCHA
YAT
CHERAKK
AKODE
PANANCHERY
VILVATTOM
PANCHAYAT
MADAKA
THARA
PANCHAYAT
PAMBOOR
PATTIKAD
PEECHIDAM
PANANCHERY
PANCHAYAT
MANNUTHY
OLLUKKARA PANCHAYAT
RESERVE
FORESTS
NADATHARA
NADATHARA
PANCHAYAT
TRICHUR
TOWN
PUTHUR PANCHAYAT

General Conditions on the Sample Farms

GENERAL CONDITIONS ON THE SAMPLE FARMS

In this chapter an attempt is made to describe the general conditions of the selected farm households. As already mentioned, 20 households were randomly selected for this study from each of the following wards, viz. Mannuthy, Nadathara, Pattikad, Chirakkakode and Pamboor of Ollukara block.

Structure of family on sample farms

Population of the selected households was classified according to the size of operational holding and according to level of gross income of the households. Information relating to family structure is given in Table 5.1 and 5.2 while Table 5.1 shows the family structure in holding size groups whereas Table 5.2 shows the same in income groups. It can be seen that average size of the family was 6.59 which almost coincided with that of Trichur district (6.22). The proportion of male population of below 6 years age, constituted 3.95 per cent of the total male population and that of female population 4.10 per cent of the total female population. Children between 6-14 years of age constituted 7.59 per cent in the case of males and 10.93 per cent in the case of females. The working population constituted 32.17 per cent in the case of males and 34.60 per cent in the case of females.

Table 5.1. Population composition of the respondents' families in different holding size groups

Family members	Holding size groups				Overall
	Smallest	Small	Medium	Large	
Male - > 60 years					
Total	10	4	4	7	25
Average	0.29	0.15	0.20	0.35	0.25
% to total	4.88	2.38	2.82	4.86	3.79
Female - > 60 years					
Total	5	8	2	4	19
Average	0.14	0.30	0.10	0.20	0.19
% to total	2.44	4.76	1.41	2.78	2.88
Male - 15-60 years					
Total	62	52	54	44	212
Average	1.82	2.00	2.70	2.20	2.12
% to total	30.24	30.95	38.03	30.56	32.17
Female - 15-60 years					
Total	72	55	52	49	228
Average	2.11	2.11	2.60	2.45	2.28
% to total	35.12	32.74	36.62	34.03	34.60
Male - 6-14 years					
Total	16	13	8	13	50
Average	0.47	0.50	0.40	0.65	0.50
% to total	7.80	7.74	5.63	9.03	7.59
Female - 6-14 years					
Total	22	13	17	20	72
Average	0.64	0.50	0.85	1.00	0.72
% to total	10.73	7.74	11.97	13.89	10.93
Male - 0-6 years					
Total	10	10	3	3	26
Average	0.29	0.38	0.15	0.15	0.26
% to total	4.88	5.95	2.11	2.08	3.95
Female - 0-6 years					
Total	8	13	2	4	27
Average	0.23	0.50	0.10	0.20	0.27
% to total	3.90	7.74	1.41	2.78	4.10
Total population	205	168	142	144	659
Average	6.03	6.46	7.10	7.20	6.59
% to total	100.00	100.00	100.00	100.00	100.00
No. of households	34	26	20	20	100

Table 5.2. Population composition of the respondents' families in different income groups

Family members	Income groups				Overall
	Lowest	Lower	Middle	High	
Male - >60 years					
Total	8	7	5	5	25
Average	0.23	0.20	0.27	0.35	0.25
% to total	4.15	3.06	3.57	5.15	3.79
Female - >60 years					
Total	6	8	3	2	19
Average	0.17	0.23	0.16	0.14	0.19
% to total	3.11	3.49	2.14	2.06	2.88
Male - 15-60 years					
Total	59	78	49	26	212
Average	1.73	2.29	2.72	1.85	2.12
% to total	30.57	34.06	35.00	26.80	32.17
Female - 15-60 years					
Total	69	81	44	34	228
Average	2.02	2.38	2.44	2.42	2.28
% to total	35.75	35.37	31.43	35.05	34.60
Male - 6-14 years					
Total	21	9	10	10	50
Average	0.61	0.26	0.55	0.71	0.50
% to total	10.88	3.93	7.14	10.31	7.59
Female - 6-14 years					
Total	19	22	15	16	72
Average	0.55	0.64	0.83	1.14	0.72
% to total	9.84	9.61	10.71	16.49	10.93
Male - 0-6 years					
Total	6	9	7	4	26
Average	0.17	0.26	0.38	0.28	0.26
% to total	3.11	3.93	5.00	4.12	3.95
Female - 0-6 years					
Total	5	15	7		27
Average	0.14	0.44	0.38	=	0.27
% to total	2.59	6.55	5.00	-	4.10
Total population	193	229	140	97	659
Average	5.67	6.74	7.78	6.93	7.59
% to total	100.00	100.00	100.00	100.00	100.00
No. of households	34	34	18	14	100

Among holding size groups it was observed that the average size of the family increased with increase in holding size. In the case of the smallest holding size group it was 6.03 members, per family and it increased to 7.2 members per family in the large holding group. In the case of income groups, family size increased with increase in gross income from the lowest income group to the middle income group but it decreased in the high income group. The sex ratio in the selected households was found to be 1105 females for 1000 males, which was also nearer to district figure (1081). This phenomenon is a characteristic feature of the population of Kerala. The age distribution of population shows that 66.77 per cent was in the age group of 15-60 years, which is regarded as working age group. Children accounted for 26.56 per cent of the total population.

Education

The information in respect of education of family members of selected households is given according to holding size groups in Table 5.3 and according to income groups in Table 5.4. It can be seen that more than 96 per cent of the males and more than 85 per cent of the females were literate on the sample farms, and the literacy rate was higher than the block figures both in the case of male and female literacy. In the case of males 40.83 per cent and 35 per cent in the case of females were educated upto high school. Illiterate

Table 5.3. Educational status of the selected samples according to holding size groups

Education	Holding size groups									
	Smallest		Small		Medium		Large		Overall	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Primary	24 (27.27)	24 (24.24)	20 (28.57)	10 (12.99)	14 (21.21)	15 (21.13)	15 (23.08)	16 (21.92)	73 (25.26)	65 (20.31)
Secondary	19 (21.59)	21 (21.22)	9 (12.86)	12 (15.58)	13 (19.70)	11 (15.49)	13 (20.00)	12 (16.44)	54 (18.69)	56 (17.50)
High School	35 (39.77)	30 (30.30)	29 (41.43)	28 (36.36)	30 (45.45)	27 (38.03)	24 (36.92)	27 (36.99)	118 (40.83)	112 (35.00)
Undergraduate	2 (2.27)	2 (2.02)	5 (7.14)	6 (7.79)	2 (3.03)	8 (11.27)	4 (6.15)	5 (6.85)	13 (4.50)	21 (6.56)
Graduate	1 (1.14)	- -	3 (4.29)	1 (1.30)	4 (6.06)	3 (4.23)	3 (4.62)	3 (4.11)	3 (3.81)	7 (2.19)
Diploma	- -	4 (4.04)	2 (2.86)	2 (2.60)	1 (1.52)	2 (2.82)	4 (6.15)	3 (4.11)	7 (2.42)	11 (3.44)
Literate	1 (1.14)	- -	2 (2.86)	-	-	-	1 (1.54)	-	4 (1.38)	-
Illiterate	6 (6.82)	18 (18.18)	-	18 (23.38)	2 (3.03)	5 (7.04)	1 (1.54)	7 (9.59)	9 (3.11)	48 (15.00)
Total	88 (100)	99 (100)	70 (100)	77 (100)	66 (100)	71 (100)	65 (100)	73 (100)	289 (100)	320 (100)

Figures in parenthesis are percentages to total

Table 5.4. Educational status of the selected samples in different income groups

Education	Income groups									
	Lowest		Lower		Middle		High		Overall	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Primary	24 (27.27)	19 (20.21)	28 (29.79)	19 (17.12)	11 (16.92)	11 (17.46)	10 (23.81)	16 (30.77)	73 (25.26)	65 (20.31)
Secondary	21 (23.86)	17 (18.09)	11 (11.70)	21 (18.92)	14 (21.54)	13 (20.63)	8 (19.05)	5 (9.62)	54 (18.69)	56 (17.50)
High school	32 (36.36)	35 (37.23)	43 (45.75)	36 (32.43)	27 (41.54)	24 (38.10)	16 (38.10)	17 (32.68)	118 (40.83)	112 (35.00)
Undergraduate	3 (3.41)	2 (2.13)	4 (4.26)	13 (11.71)	5 (7.68)	3 (4.76)	1 (2.38)	3 (5.77)	13 (4.50)	21 (6.56)
Diploma	-	2 (2.13)	3 (3.19)	2 (1.80)	3 (4.62)	5 (7.94)	1 (2.38)	2 (3.85)	7 (2.42)	11 (3.44)
Literate	1 (1.14)	-	1 (1.06)	-	2 (3.08)	-	-	-	4 (1.38)	-
Illiterate	6 (6.82)	19 (20.21)	1 (1.06)	19 (17.12)	-	6 (9.52)	2 (4.76)	4 (7.69)	9 (3.11)	48 (15.00)
Total	88 (100)	94 (100)	94 (100)	111 (100)	65 (100)	63 (100)	42 (100)	52 (100)	289 (100)	320 (100)

Figures in parenthesis are percentage to total

females constituted 15 per cent of the total female population but in the case of males, illiterates constituted only 3.11 per cent of the total male population. Another important point to note is that people coming under the class illiterates were more than 50 years in age.

Among holding size groups female illiteracy was highest in the small holding size group and there was no clearcut association between holding size and female illiteracy. In the case of male illiteracy, it was highest in the smallest holding size group. Of all levels of education, the proportion of population educated upto high school level was highest in all holding size groups as well as in male and female categories.

Female illiteracy negatively associated with levels of income. In the case of male illiteracy, no consistent pattern was found in relation to income. But all the illiterates were in the age group of 50 years and above. Among sample households 90.6 per cent of the total population was literate.

Of all levels of education, proportion of population educated upto high school was high in all income groups and in male and female cate, This was because of the fact that in each panchayat one high school was running.

Occupation

The respondents were classified according to their occupation, as those depending on agriculture alone,

agriculture and labour, agriculture and business, agriculture and service and agriculture along with business and service. The relevant figures are shown according to holding size groups in Table 5.5 and according to income groups in Table 5.6.

It can be seen that 21 per cent of the total respondents were depending on agriculture alone, 10 per cent on agriculture and labour, 49 per cent on agriculture and service. 16 per cent on agriculture and business and 4 per cent on agriculture along with service and business.

Among holding size groups, 35 per cent of the total respondents in the large holding size groups and only 5.88 per cent in the smallest holding size were depending on agriculture alone. Dependence on agriculture and labour was found only in the smallest holding size group (23.53%) and small holding size group (7.69%). Sixty per cent of the large holding size group respondents were depending on agriculture and service followed by 50 per cent in the medium as well as small holding size groups and 41 per cent in the smallest holding size group. About 6 per cent of respondents in the smallest holding size group, 5 per cent in medium holding size group and 3.85 per cent in the small holding size group were depending on agriculture, business as well as on service.

Table 5.5. Classification of respondents according to occupation - holding size group

Size group	Agriculture	Agriculture + labour	Agriculture + service	Agriculture + business	Agriculture + service + business	Total
Smallest	2 (5.88)	8 (23.53)	14 (41.18)	8 23.53)	2 (5.88)	34 (100.00)
Small	6 (23.08)	2 (7.69)	13 (50.00)	4 (15.38)	1 (3.85)	26 (100.00)
Medium	6 (30.00)	-	10 (50.00)	3 (15.00)	1 (5.00)	20 (100.00)
Large	7 (35.00)	-	12 (60.00)	1 (5.00)	-	20 (100.00)
Overall	21 (21.00)	10 (10.00)	49 (49.00)	16 (16.00)	4 (4.00)	100 (100.00)

Figures in parenthesis are percentage to total

Table 5.6. Classification of respondents according to occupation income groups

Income group	Agriculture	Agriculture + labour	Agriculture + service	Agriculture + business	Agriculture + service + business	Total
Lowest	7 (20.59)	8 (23.53)	10 (29.41)	8 (23.53)	1 (2.94)	34 (100.00)
Lower	8 (23.53)	2 (5.88)	20 (58.82)	3 (8.83)	1 (2.94)	34 (100.00)
Middle	4 (22.22)	-	10 (55.56)	3 (16.67)	1 (5.56)	18 (100.00)
High	2 (14.29)	-	9 (64.29)	2 (14.29)	1 (7.13)	14 (100.00)
Overall	21 (21.00)	10 (10.00)	49 (49.00)	16 (16.00)	4 (4.00)	100 (100.00)

Figures in parenthesis are percentage to total

Among income groups, 23.53 per cent of respondents in the lower income group, followed by 22.22 per cent of respondents in middle income group and 20.59 per cent of respondents in the lowest income group were depending on agriculture alone. Dependence on agriculture and labour was highest in the lowest income group. More than three-fourth of the high income group were in agriculture and service. Respondents depending on agriculture and business were highest in the lowest income group.

Membership in co-operatives and shares

Membership of respondents and their shares and share values in different co-operative societies, milk societies and others are shown according to holding size groups in Table 5.7 and according to income groups in Table 5.8. It can be seen that 91 per cent of the shares and 91 per cent of the money in shares were in Service Co-operative Banks which also supply inputs of agriculture along with consumer goods. It is interesting to note that each household was having atleast one share in the name of the head of the household and the largest number of shares was as many as 400. Even major children of the households were having shares in these banks. Shares in milk societies were only 1.61 per cent and in other societies 7.08 per cent of the total shares. The other societies were Employees Co-operative societies, housing societies, Police co-operative societies, etc.

Table 5.7. Membership and shares of farm families selected according to holding size group

Name of the societies	Smallest		Small		Medium		High		Total	
	Share	Value	Share	Value	Share	Value	Share	Value	Share	Value
Service Co-operative Bank	102 (77.86)	1088.00 (77.27)	253 (89.09)	2354.00 (92.57)	630 (95.74)	4576.00 (94.10)	203 (89.04)	2411.00 (90.40)	1188 (91.31)	10429.00 (90.84)
Milk Co-operative Society	12 (9.16)	120.00 (8.52)	1 (0.35)	10.00 (0.39)	3 (0.46)	37.00 (0.76)	5 (2.19)	56.00 (2.10)	21 (1.61)	223.00 (1.94)
Other Societies	17 (12.98)	200.00 (14.21)	30 (10.56)	179.00 (7.04)	25 (3.80)	250.00 (5.14)	20 (8.77)	200.00 (7.50)	92 (7.08)	829.00 (7.22)
Total	131 (100.00)	1408.00 (100.00)	284 (100.00)	2543.00 (100.00)	658 (100.0)	4863.00 (100.00)	228 (100.00)	2667.00 (100.00)	1301 (100.00)	11481.00 (100.00)

Figures in parenthesis are percentages to total

Table 5.8. Membership and shares of farm families selected according to income groups

Name of the Societies	Lowest		Lower		Middle		High		Total	
	Share	Value	Share	Value	Share	Value	Share	Value	Share	Value
Service Co-operative Bank	146 (85.38)	1865.00 (88.18)	316 (90.03)	2827.00 (91.58)	517 (94.69)	3152.00 (91.36)	209 (89.70)	2585.00 (91.38)	1188 (91.31)	10429.00 (90.84)
Milk co-operative societies	12 (7.02)	120.00 (5.67)	3 (0.85)	35.00 (1.13)	2 (0.37)	24.00 (0.70)	4 (1.72)	44.00 (1.56)	21 (1.61)	223.00 (1.94)
Other societies	13 (7.60)	130.00 (6.15)	32 (9.12)	225.00 (7.29)	27 (4.96)	274.00 (7.94)	20 (8.58)	200.00 (7.07)	92 (7.08)	829.00 (7.22)
Total	171 (100)	2115.00 (100)	351 (100)	3087.00 (100)	546 (100)	3450.00 (100)	233 (100)	2829.00 (100)	1301 (100)	11481.00 (100)

Figures in parenthesis are percentages to total

Among holding size groups, the proportion of shares in servioe co-operative banks increased with increase in the holding size from smallest holding size group to medium holding size group, but it decreased in the large holding size group. The proportion of shares in milk co-operative sooieties was highest in the smallest holding size group (9.16%) while it was the lowest in the small holding size group (0.35%). The proportion of shares in other societies showed a decrease with increase in holding size from the smallest holding size group to medium holding size group but it increased in the large holding size group.

Among income groups, the proportion of shares in the service co-operative banks showed an increase with increase in income from the lowest income group to middle income group but decreased in the high income group. The proportion of shares in milk co-operatives showed a decrease with increase in income in the lowest income group to middle inoome group but increased in the high income group. The proportion of shares in other societies, did not show any pattern.

Size of holding

The total operational area of the sample farms was 78.609 ha and the average holding size was 0.786 ha. The relevant figures regarding average holding size and area operated are shown in Tables 5.9 and 5.10.

Table 5.9. Distribution of households surveyed according to holding size group, area operated and average holding size

Size group of holdings (hectares)	No. of holdings	Per cent to total	Total area operated (hectares)	Per cent to total area operated	Average size of holdings (hectares)
0.0-0.40	34	34.00	6.635	8.44	0.195
0.40-0.81	26	26.00	15.458	19.66	0.594
0.81-1.21	20	20.00	19.311	24.57	0.965
1.21 +	20	20.00	37.205	47.33	1.860
Total	100	100.00	78.609	100.00	0.786

Table 5.10. Distribution of households surveyed according to income level, area operated and average holding size

Gross income group (Rs/annum)	Number of holdings	Per cent to total	Total area operated (hectares)	Per cent to total area operated	Average size of holdings (hectares)
0 - 15000	34	34.00	10.621	13.51	0.312
15000-25000	34	34.00	25.279	32.16	0.643
25000-35000	18	18.00	19.071	24.26	1.059
35000 +	14	14.00	23.638	30.07	1.688
Total	100	100.00	78.609	100.00	0.786

Among holding size groups, the average holding size in the smallest holding size group was 0.195 ha, whereas it was 1.860 ha in the large holding size group. It can also be seen that 80 per cent of the holdings were operating only 52.67 per cent of the total area, whereas rest 20 per cent of the holdings were operating as much as 47.33 per cent of the operational area. The average size of holding was less than one hectare in 80 per cent of the holdings.

Among income groups, the average holding size in the lowest income group was 0.312 ha whereas it was 1.688 ha in the high inoome group. Sixtyeight per cent of the households had a gross income of less than Rs.25,000/- per family. The average size of operational holding in their case was less than one hectare and they accounted only for 46 per cent of the total area. Thirtytwo per cent of the total households were in the gross income groups of more than Rs.25,000/- per family and they accounted for 54 per cent of the total operational area and the average holding size was more than one hectare. Leasing in or out land was practically absent.

Cropping pattern

The choice and combination of crops grown by indivudual cultivators depend on several factors. It primarily depends

on the soil, climate, farmers requirements of food and fodder, markets and prices etc. The availability of labour, capital and irrigation also influence the cropping pattern to a great extent.

The figures relevant to cropping pattern are given according to holding size groups in Table 5.11 and according to income groups in Table 5.12. The average size of holding was 0.786 of which 0.404 ha was under paddy and the remaining 0.382 ha was garden land. The gross area cropped in the sample was 142.498 ha and cropping intensity was 181.27 per cent. On an average 69.77 per cent of the gross area was under paddy, 15.38 per cent under coconut, 3.22 per cent under arecanut, 4.81 per cent under banana and 5.99 per cent under other crops.

Among holding size groups, the proportion of gross area under paddy showed an increase with increase in holding size from the smallest holding size group to the medium holding size group and was highest in the medium holding size group (80.06%) but it decreased (64.00%) in the large holding size group. Per farm gross area under paddy increased consistently with increase in holding size.

The proportion of gross area under coconut showed a decrease with increase in holding size from the smallest holding size group (23.4%) to the medium holding size

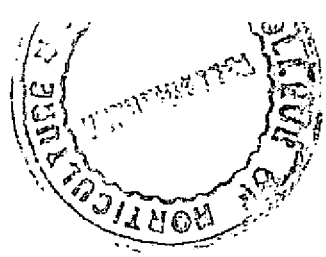


Table 5.11. Cropping pattern on the sample farms according to holding size groups (figures in hectares)

Items	Smallest	Small	Medium	Large	Total
Net area	6.635	15.458	19.311	37.205	78.609
Per farm	0.195	0.595	0.966	1.860	0.786
Net area under paddy	2.991	8.862	12.991	15.570	40.414
Per farm	0.088	0.341	0.650	0.779	0.404
Net garden land	3.644	6.596	6.320	21.635	38.195
Per farm	0.107	0.254	0.316	1.082	0.382
Gross area under paddy	7.312 (58.55)	21.328 (74.34)	29.571 (80.06)	41.207 (64.00)	99.418 (69.77)
Per farm	0.215	0.820	1.479	2.060	0.994
Area under cocoonut	2.922 (23.40)	4.444 (15.49)	4.250 (11.51)	10.294 (15.99)	21.910 (15.38)
Per farm	0.086	0.171	0.213	0.515	0.219
Arecanut	0.462 (3.70)	1.082 (3.77)	0.789 (2.14)	2.259 (3.51)	4.592 (3.22)
Per farm	0.014	0.042	0.039	0.113	0.046
Pepper	0.093 (0.74)	0.183 (0.64)	0.124 (0.34)	0.791 (1.23)	1.191 (0.84)
Per farm	0.003	0.007	0.006	0.040	0.012
Banana	1.148 (9.19)	1.391 (4.85)	1.759 (4.75)	2.551 (3.96)	6.849 (4.81)
Per farm	0.034	0.054	0.088	0.128	0.068
Others	0.551 (4.42)	0.263 (0.91)	0.445 (1.20)	7.279 (11.31)	8.538 (5.99)
Per farm	0.016	0.010	0.022	0.364	0.085
Gross area	12.488 (100.00)	28.691 (100.00)	36.938 (100.00)	64.381 (100.00)	142.498 (100.00)
Per farm	0.367	1.104	1.847	3.219	1.425
Area cropped more than once	5.853	13.233	17.627	27.176	63.889
Cropping intensity (percentage)	188.21	185.61	191.28	173.04	181.27

Figures in parenthesis are percentage to gross area

group to 15.99 per cent. The proportion of gross area under arecanut was 3.70 per cent in the smallest holding size group and 3.77 per cent, 2.14 per cent and 3.51 per cent in the small, medium and large holding size groups respectively. Eventhough the area under banana increased with increase in holding size, the proportion of area under banana decreased from 9.19 per cent in the smallest holding size group to 3.96 per cent in the large holding size group. Cropping intensity was highest in the medium holding size group (191.28%) and lowest in the large holding size group (173.04%).

Among income groups, the proportion of gross area under paddy to gross cropped area did not show any pattern. It was the highest in the lower income group (75.67%) and lowest in the lowest income group (63.31%). The proportion of gross area under coconut to total gross cropped area showed a decrease from the lowest income group (18.34%) to the middle income group (14.20%), but it slightly increased in the high income group to 15.95 per cent. But the absolute gross area under coconut increased with increase in income except in the high income group and gross area under coconut per farm also increased with increase in income. The proportion of area under arecanut did not show any pattern of change, with change in income. The proportion of area under banana also did not show any pattern. Cropping intensity

Table 5.12. Cropping pattern of sample farms according to income groups (figures in hectares)

Items	Lowest	Lower	Middle	High	Total
Net area	10.621	25.276	19.073	23.639	78.609
Per farm	0.312	0.743	1.060	1.689	0.786
Net area (paddy)	5.076	14.960	9.085	11.295	40.414
Per farm	0.149	0.440	0.505	0.807	0.404
Net garden land	5.545	10.320	9.988	12.343	38.195
Per farm	0.163	0.304	0.555	0.882	0.382
Gross area (paddy)	11.927 (63.31)	35.753 (75.67)	21.231 (66.12)	30.506 (68.87)	99.418 (69.77)
Per farm	0.351	1.052	1.180	2.179	0.994
Area under:-					
Coconut	3.456 (18.34)	6.828 (14.45)	4.561 (14.20)	7.065 (15.95)	21.910 (15.38)
Per farm	0.102	0.201	0.253	0.505	0.219
Arecanut	0.830 (4.41)	1.103 (2.33)	1.300 (4.05)	1.359 (3.07)	4.592 (3.22)
Per farm	0.024	0.032	0.072	0.097	0.046
Pepper	0.149 (0.79)	0.259 (0.55)	0.387 (1.21)	0.396 (0.89)	1.191 (0.84)
Per farm	0.004	0.008	0.022	0.028	0.012
Banana	0.960 (5.10)	1.650 (3.49)	1.445 (4.50)	2.794 (6.31)	6.849 (4.81)
Per farm	0.028	0.049	0.080	0.200	0.068
Others	1.518 (8.06	1.656 (3.50)	3.186 (9.92)	2.178 (4.91)	8.538 (5.99)
Per farm	0.045	0.049	0.177	0.156	0.085
Gross area	18.840 (100.00)	47.249 (100.00)	32.110 (100.00)	44.298 (100.00)	142.498 (100.00)
Per farm	0.554	1.390	1.784	3.164	1.425
Area cropped more than once	8.219	21.973	13.037	20.659	63.889
Crop intensity (percentage)	177.38	186.93	168.35	187.39	181.27

Figures in parenthesis are percentage to gross area

was the highest in the high income group (187.39%) followed by lower income group (186.93%), lowest income group (177.38%) and middle income group (168.35%).

Irrigation on sample farms

The main source of irrigation in the study area is canal. But the extent of area irrigated by canal is limited and seasonal. The figures relevant to the area irrigated under different sources are given according to holding size groups in Table 5.13 and according to income groups in Table 5.14.

It was found that on sample farms, the main source of irrigation was well, covering 40.77 per cent of the total net area. This was closely followed by canal irrigation covering 39.32 per cent of the total area. But canal irrigation is seasonal and that will be provided only for paddy. Canal, well and tanks were the sources of irrigation observed on sample farms covering 82 per cent of the net area.

Among holding size groups, the proportion of area irrigated by canal to total irrigated area was around 56 per cent in the large and medium sized holdings, while this proportion was much less in the other groups. The large size group had 47.82 per cent of the total area under canal irrigation. In the smallest and small holding size groups

Table 5.13. Net area irrigated on sample farms by different sources in holding size groups (figures in hectares)

Holding size groups	Canal	Well	Tank	Total irri-gated	Unirri-gated	Total area
Smallest						
Total	1.506 (22.70)	3.814 (57.48)	-	5.320 (80.18)	1.314 (19.82)	6.635 (100.00)
Per farm	0.044	0.112	-	0.156	0.039	0.195
Small:						
Total	3.441 (22.26)	8.904 (57.60)	0.688 (4.45)	13.033 (84.31)	2.425 (15.69)	15.458 (100.00)
Per farm	0.132	0.342	0.026	0.501	0.093	0.595
Medium:						
Total	9.235 (47.82)	6.462 (33.46)	0.737 3.82)	16.434 (85.10)	2.877 (14.90)	19.311 (100.00)
Per farm	0.462	0.323	0.037	0.822	0.144	0.966
Large:						
Total	16.725 (44.95)	12.865 (34.58)	0.146 (0.39)	29.736 (79.92)	7.469 (20.08)	37.205 (100.00)
Per farm	0.836	0.643	0.007	1.487	0.373	1.860
Overall total	30.907 (39.32)	32.045 (40.77)	1.571 (2.00)	64.523 (82.09)	14.086 (17.91)	78.609 (100.00)
Per farm	0.309	0.320	0.016	0.645	0.141	0.786

Figures in parenthesis are percentages to total area

not even one-fourth of their net area was covered by canals. The proportion of area under wells to net cropped area was highest in the small holding size group where 57.60 per cent of its net area was irrigated by wells. It was closely followed by the smallest holding size group where wells were irrigating 57.48 per cent of net area in that group. The proportion of area irrigated by all sources to net area was the highest in the medium holding size group (85.10%). But it was lowest in the large holding size group where only 79.92 per cent of the net area was irrigated. This fact was reflected in cropping intensity, which was highest in the medium holding size group (191.28%) and lowest in the large holding size group (173.04%).

Among income groups, the proportion of area irrigated by canal to net area was highest in the high income group where canals were irrigating more than three-fourths of their net area (75.82%). But in the low income group which comes next, canals irrigated only 31.56 per cent of the net area. The proportion of area irrigated by wells was highest in the middle income group where wells irrigated 55.44 per cent of their net area, followed by 51.52 per cent of the net area in the lowest income group. Wells irrigated only 22.12 per cent of the net area in the high income group. The proportion of area irrigated (from all sources) to total net area was as much as 97.94 per cent in the high income

Table 5.14. Net area irrigated on sample farms by different sources in income group (figures in hectares)

Income groups	Canal	Well	Tank	Total irriga-ted	Unirri-gated	Total area
Lowest:						
Total	2.134 (20.09)	5.472 (51.52)	0.688 (6.48)	8.294 (78.09)	2.327 (21.91)	10.621 (100.00)
Per farm	0.063	0.161	0.020	0.244	0.068	0.312
Lower:						
Total	7.976 (31.56)	10.769 (42.61)	0.737 (2.92)	19.482 (77.09)	5.794 (22.91)	25.276 (100.00)
Per farm	0.235	0.317	0.021	0.573	0.170	0.743
Middle:						
Total	2.874 (15.07)	10.574 (55.44)	0.146 (0.77)	13.594 (71.28)	5.479 (28.72)	19.073 (100.00)
Per farm	0.160	0.587	0.008	0.755	0.304	1.060
High:						
Total	17.923 (75.82)	5.230 (22.12)	-	23.153 (97.94)	0.486 (2.06)	23.639 (100.00)
Per farm	1.280	0.374		1.654	0.035	1.689
Overall total	30.907 (89.32)	32.045 (40.77)	1.571 (2.00)	64.523 (82.09)	14.086 (17.91)	78.609 (100.00)
Per farm	0.309	0.320	0.016	0.645	0.141	0.786

Figures in parenthesis are percentages to total area

group followed by 78.09 per cent, 77.09 per cent and 71.28 per cent in the lowest, low and middle income groups respectively. This fact again was reflected in the cropping intensity which was highest in the high income group (187.39%) and lowest in the middle income group (168.35%). As canal irrigation is seasonal, cropwise area irrigated was also studied. The figures relevant to cropwise area irrigated on sample farms are shown according to holding size groups in Table 5.15 and according to income groups in Table 5.16.

Of total irrigated area under different crops paddy accounted for the largest share. It had 56.62 per cent of the total irrigated area, of which mundakan paddy accounted for 34.89 per cent and puncha paddy 21.73 per cent. The next in importance was coconut which accounted for 25.62 per cent followed by banana, arecanut and others with 8.01 per cent, 5.37 per cent and 2.99 per cent respectively.

Among holding size groups except in the smallest holding size in all other holding size groups paddy accounted for more than half of each groups irrigated area. Among income groups also paddy accounted for more than half of the irrigated area followed by coconut, banana, arecanut and pepper.

Eventhough both mundakan and puncha paddy are irrigated, the entire mundakan crop is irrigated by Peechi

Table 5.15. Crop-wise area irrigated on sample farms (gross area) in holding size groups (figures in hectares)

Crop	Smallest	Small	Medium	Large	Total
Paddy					
Mundakan	1.931 (23.64)	5.830 (34.71)	10.154 (48.10)	11.927 (30.23)	29.842 34.89)
Puncha	1.328 (16.26)	3.603 (21.45)	3.587 17.00)	10.065 (25.51)	18.583 (21.73)
Coconut	2.922 (36.63)	4.444 (26.46)	4.250 (20.13)	10.294 26.09)	21.910 (25.62)
Arecanut	0.462 (5.66)	1.082 (6.44)	0.789 (3.74)	2.259 (5.73)	4.592 (5.37)
Banana	1.148 (14.05)	1.391 (8.28)	1.759 (8.33)	2.551 (6.47)	6.849 (8.01)
Pepper	0.093 (1.14)	0.183 (1.09)	0.124 (0.59)	0.791 (2.00)	1.191 (1.39)
Others	0.284 (3.48)	0.263 (1.57)	0.445 (2.11)	1.567 (3.97)	2.559 (2.99)
Total	8.168 (100.00)	16.796 (100.00)	21.108 (100.00)	39.454 (100.00)	85.526 (100.00)

Figures in parenthesis are percentages to total

Table 5.16. Cropwise area irrigated in sample farms (gross area) in income groups (figures in hectares)

Crop	Lowest	Lower	Middle	High	Total
Paddy:					
Mundakan	4.016 (35.16)	9.061 (35.13)	5.469 (32.85)	11.296 (35.67)	29.842 (34.89)
Puncha	1.773 (15.52)	5.834 (22.62)	3.061 (18.39)	7.915 (25.00)	18.583 (21.73)
Coconut	3.456 (30.25)	6.828 (26.47)	4.561 (27.40)	7.065 (22.31)	21.910 (25.62)
Arecanut	0.830 (7.27)	1.103 (4.28)	1.300 (7.81)	1.359 (4.29)	4.592 (5.37)
Banana	0.960 (8.40)	1.650 (6.40)	1.445 (8.68)	2.794 (8.82)	6.849 (8.01)
Pepper	0.149 (1.30)	0.259 (1.00)	0.387 (2.32)	0.396 (1.25)	1.191 (1.39)
Others	0.239 (2.09)	1.057 (4.10)	0.425 (2.55)	0.838 (2.65)	2.559 (2.99)
Total	11.423 (100.00)	25.792 (100.00)	16.648 (100.00)	31.663 (100.00)	85.526 (100.00)

Figures in parenthesis are percentages to total

irrigation water (canal water) whereas puncha crop is irrigated by canal water as well as by wells. The farms in the Pattikad area are benefited by the peechi water in the puncha season because of leaching of water from R.B.C. of the peechi irrigation project, which supplies water for kole lands during that season. The puncha crop was grown in tiny patches even in the large holding size groups where irrigation was provided through pumpsets. In fact, this shows that paddy in the puncha season is grown not on commercial lines but for consumption only.

Livestock on selected farms

The position of distribution of livestock population and investment in livestock are shown according to holding size groups in Table 5.17 and according to income groups in Table 5.18.

It can be seen that the average number of livestock per family was 1.78. However, it increased from 1.12 in the smallest holding size group to 3.05 in the large holding size groups. In the case of income groups, it increased from 0.97 in the lowest income group to 3.50 in high income group.

From agriculture point of view, the position of draft animals is important. But in the case of Kerala where

Table 5.17. Livestock position and capital investment on livestock on sample farms - holding size group

Holding size group	Draft animals	Milch animals	Young stock	Goat	Total Live-stock	Poultry
Smallest:						
Number of animals	6	19	10	3	38	21
Average/farm	0.18	0.56	0.29	0.09	1.12	0.62
Average value per farm	144.12	1047.06	216.17	13.24	1420.59	11.76
% to total	10.15	73.70	15.22	0.93	100.00	-
Small:						
Number of animals	-	23	11	2	36	21
Average/farm	-	0.86	0.42	0.08	1.38	0.81
Average value per farm	-	1186.54	213.46	11.53	1411.53	17.31
% to total	-	84.06	15.12	0.82	100.00	-
Medium:						
Number of animals	6	21	16	-	43	32
Average/farm	0.30	1.05	0.80	-	2.15	1.60
Average value per farm	225.00	2086.25	605.00	-	2916.25	32.50
% to total	7.71	71.54	20.74	-	100.00	-
Large:						
Number of animals	14	26	21	-	61	22
Average/farm	0.70	1.30	1.05	-	3.05	1.10
Average value per farm	650.00	2362.50	607.50	-	3620.00	20.00
% to total	17.96	65.26	16.78	-	100.00	-
Overall:						
Number of animals	26	89	58	5	178	96
Average/farm	0.26	0.89	0.58	0.05	1.78	0.96
Average value per farm	224.00	1554.25	371.50	7.50	2157.25	19.00
% to total	10.38	72.05	17.22	0.35	100.00	-

Table 5.18. Livestock position and capital investment in livestock on sample farms - income group

Income group	Work animals	Milch animals	Young stock	Goats	Total live-stock	Poultry
Lowest:						
Number of animals	2	17	9	5	33	8
Average/farm	0.06	0.50	0.26	0.15	0.97	0.24
Average value per farm	44.12	908.82	154.41	22.06	1129.41	5.24
% to total	3.91	80.47	13.67	1.95	100.00	-
Lower:						
Number of animals	6	34	16	-	56	34
Average/farm	0.18	1.00	0.47	-	1.65	1.00
Average value per farm	129.41	1535.29	273.52	-	1938.22	19.71
% to total	6.68	79.21	14.11	-	100.00	-
Middle:						
Number of animals	8	20	12	-	40	--
Average/farm	0.44	1.11	0.67	-	2.22	-
Average value per farm	427.78	1927.78	541.67	-	2897.23	-
% to total	14.77	66.54	18.69	-	100.00	-
High:						
Number of animals	10	18	21	-	49	54
Average/farm	0.71	1.29	1.50	-	3.50	3.86
Average value per farm	628.57	2673.21	917.86	-	4219.64	75.00
% to total	14.90	63,35	21.75	-	100.00	-
Overall:						
Number of animals	26	89	58	5	178	96
Average/farm	0.26	0.89	0.58	0.05	1.78	0.96
Average value per farm	224.00	1554.25	371.50	7.50	2157.25	19.00
% to total	10.38	72.05	17.22	0.35	100.00	-

holding size is too small, maintenance of draft animals is not remunerative. The average draft animal number per farm in the entire sample was only 0.26. Farmers even in the large size holding group and high income group did not have an average one pair of draft animals, per farm.

Milch animals per family was only 0.89. Among holding size groups it increased from 0.56 in the smallest holding size group to 1.30 in the large holding size group. Among income groups it increased from 0.50 in the lowest income group to 1.29 in the high income group. Other animals like goats were not seen except on two sample farms. Poultry with three or four birds in the backyard was common on the farms surveyed.

Of the total investment on animals, 72 per cent was on milch animals. Among holding size groups, the relative proportion of investment on milch animals was highest in the small holding size group. Among income groups the proportion of capital investment in milch animals was highest in the lowest income group accounting for 80.47 per cent of the total investment on the livestock, which indicates that dairying is considered important by lowest income group.

Capital investment on sample farms

The investment in land, livestock, buildings and implements and machinery is a real estate of the farmer.

This investment put together contributes to an increase in the earnings in the farming. It involves heavy investment and has a long standing effect which influences the overall profitability of the farm business.

The figures relevant to capital investment are shown according to holding size groups in Table 5.19 and according to income groups in Table 5.20.

At overall level the proportion of investment on land itself accounted for 85.35 per cent of the total investment followed by 12.62 per cent on residential buildings and 1.12 per cent on livestock. Investment on farm buildings was negligible, so also was investment on implements and machinery.

Among holding size groups the proportion of investment on land to total investment increased with increase in holding size, from 70 per cent in the smallest holding size group to 90.44 per cent in the large holding size group. Investment on farm buildings was less than one per cent in all holding size groups. Investment on residential buildings showed a decrease with increase in holding size from 26.83 per cent in the smallest holding size group to 8.04 per cent in the large holding size group. On livestock, the investment proportion was comparatively high in the smallest holding size group constituting 2.11 per cent of

Table 5.19. Capital assets of the selected farmers in holding size groups (figures in rupees)

Holding size groups	Land	Building		Livestock	Implements and machinery	Total
		Farm	Residential			
Smallest:						
Per farm	47479.41	329.41	18191.18	1432.35	363.92	67796.27
Per hectare	243300.68	1688.02	93217.78	7339.84	1864.83	347411.15
% to total	70.03	0.49	26.83	2.11	0.54	100.00
Small:						
Per farm	127441.34	865.96	22711.54	1428.84	908.66	153356.34
Per hectare	214353.41	1456.53	38200.28	2403.28	1528.34	257941.84
% to total	83.10	0.56	14.82	0.93	0.59	100.00
Medium:						
Per farm	189757.50	1133.75	26950.00	2948.75	1310.88	222100.88
Per hectare	196527.88	1174.20	27911.55	3053.96	1357.65	230025.24
% to total	85.44	0.51	12.13	1.33	0.59	100.00
Large:						
Per farm	389550.00	1458.00	34650.00	3640.00	1447.60	430745.60
Per hectare	209407.34	783.77	18626.53	1956.73	778.18	231552.55
% to total	90.44	0.34	8.04	0.85	0.34	100.00
Overall:						
Per farm	165139.25	855.50	24410.00	2176.25	911.68	193492.68
Per hectare	210076.77	1088.30	31052.42	2768.45	1159.76	246145.70
% to total	85.35	0.44	12.62	1.12	0.47	100.00

Table 5.20. Capital assets on selected farms - income groups (figures in rupees)

Income groups	Land	Buildings		Livestock	Implements and machinery	Total
		Farm	Residential			
Lowest:						
Per farm	68742.64	373.52	17352.94	1134.70	425.18	88028.98
Per hectare	220059.32	1195.74	55550.32	3632.41	1361.09	281798.88
% to total	78.09	0.42	19.72	1.29	0.48	100.00
Lower:						
Per farm	145734.56	817.65	22735.29	1957.93	798.07	172043.50
Per hectare	196034.78	1099.86	30582.37	2633.71	1073.52	231424.24
% to total	84.71	0.48	13.21	1.14	0.46	100.00
Middle:						
Per farm	243012,50	1058.33	31888.88	2897.23	1326.41	280183.35
Per hectare	229341.22	998.79	30094.89	2734.24	1251.79	264420.93
% to total	86.73	0.38	11.38	1.03	0.48	100.00
High:						
Per farm	346248.21	1857.14	36000.00	4294.64	1835.85	390235.84
Per hectare	205062.61	1099.88	21320.69	2543.47	1087.27	231113.92
% to total	88.73	0.48	9.23	1.10	0.47	100.00
Overall:						
Per farm	165139.25	855.50	24410.00	2176.25	911.68	193492.68
Per hectare	210076.77	1088.30	31052.42	2768.45	1159.76	246145.70
% to total	85.35	0.44	12.62	1.12	0.47	100.00

the total investment. Investment on farm machinery was less than one per cent in all holding size groups. The investment per farm increased with increase in holding size on all capital investment items.

Among income groups, the proportion of investment on land increased with increase in income from 78.09 per cent of the total investment in the lowest income group to 88.73 per cent in the high income group. Investment on farm buildings was less than half per cent in all income groups. Proportion of investment on residential buildings as well as on livestock decreased with increase in income. But investment on machinery was constant in all income groups. Even per farm investment on all items increased with increase in income. It is interesting to note that the main item of investment was land followed by residential buildings.

Farm Business Structure

FARM BUSINESS STRUCTURE

In this chapter, an attempt is made to describe the methods and practices followed for the important crops grown in the region as also to work out the economics of these crops. The latter would give an idea about the farm business in the sample households. Seasonal crops are dealt with first followed by annual crops and perennial crops.

Seasonal crops (paddy)

Paddy is the most important seasonal crop grown in the study area. It is also the main seasonal crop. It is grown under both rainfed and irrigated conditions. The crop is grown either as a transplanted or direct sown crop, depending on the availability of water and other conditions.

Viruppu, the first paddy crop is sown during May-June and harvested in September-October. It is a transplanted crop. This crop is a rainfed one and depends on south west monsoon.

Mundakan, the second paddy crop is sown during September-October and harvested in December-January. It is either a transplanted crop in areas like Panancherry panchayat of the study area or a broadcasted (directly sown) crop in areas like Kolazhy and Vilvattam panchayats of the study area. This crop is either completely rainfed where irrigation facilities

are not available and supplementary irrigation is provided by water stored in small tanks during rainy season or it is irrigated by Peechi project water.

The third paddy crop, puncha which is a broadcasted crop sown in December-January and harvested in March-April. Puncha crop is taken up only by farmers who have sufficient irrigation facilities of their own. In the study area, it is grown in small patches with the help of well irrigation. But in Panancherry panchayat puncha crop is grown with Peechi water which escapes as seepage from R.B.C. of the Peechi project.

Land preparation

To provide suitable tilth for any crop, land preparation is necessary. For paddy the main field is ploughed after receiving the first showers of south west monsoon, for Viruppu crop. Ploughing and puddling will be done for getting proper tilth of the soil. Ploughing and puddling is done three to four times for this crop. Bullock labour is the main source of power in this season. As most of the paddy land is left fallow during January-April, the soil will be hard to break which makes the farmers prefer to use bullock labour for first ploughing and later tractor. During ploughing, organic manures are incorporated into soil and before transplanting a part of fertilizers are added to soil particularly potassium and phosphorus fertilizers fully and a part

of nitrogen fertilizers. Applying green manure is also observed.

For Mundakan paddy and Puncha paddy, land is thoroughly ploughed and puddled for a fine tilth as partially mundakan, and puncha crop entirely are raised by broadcasting. During these two seasons, tractor hiring in is common even on small holdings as tractor ploughing provides a fine tilth. Even human labour employment for this purpose is noticed. The use of bullock labour hours and tractor hours used for viruppu paddy can be seen in Appendix II, Tables 1 and 2.

For high yielding varieties, the average number of bullock labour hours used per hectare was 59.03 with 1.98 hours of tractor. Among holding size groups, more bullock power was used in small holding size group where use of tractor was completely absent. The use of bullock labour was lowest in medium holding group but in their case tractor use with 3.65 hours per hectare was the highest. Among income groups, more of bullock labour (76 hours) was used in the lowest income group who did not use any tractor power. Lowest of the bullock labour was used in the high income group and the maximum of tractor power was used in middle income group.

For traditional varieties an average of 43.9 hours of bullock labour with 3.75 hours of tractor power was used for

ploughing. Among holding size groups highest level of bullock labour was used in medium holding size group and the lowest in small holding size group. Highest tractor power used was 5.72 hours in small holding size group and lowest was 2.74 hours in the large holding size group. Among income groups, highest bullock labour used was 54.1 hours in the lowest income group and lowest in the middle income group (34.3 hours). Use of tractor power was lowest (2.21 hours) in the lowest income group. In middle income group it was 5.21 hours, which was the highest.

Mundakan paddy

The figures relating to bullock labour and tractor use in mundakan season are given in Tables 3 and 4 of Appendix II. For HYV paddy, the average number of bullock labour hours used was 44.93 hours and of tractor 2.79 hours for ploughing. Among holding size groups, high bullock labour use (63.7 hours) with no use of tractor power was seen in the smallest holding size group. Higher tractor power use was observed in medium size holding group (4.28 hours). But lowest bullock labour use was seen in this group. Among income groups, the lowest income group used highest bullock labour (57.4 hours) and 0.75 hours of tractor power, where as a combination of lower bullock labour (33.70 hours) and higher tractor power (4.5 hours) was seen in lower income groups.

For traditional varieties, the average bullock labour used was 26.47 hours with 4.09 hours of tractor power. Among holding size groups, highest bullock labour and lowest tractor power (3.15 hours) were used in smallest holding size group. Highest tractor power (4.85 hours) and lowest bullock labour were used in the small holding size group. Among income groups, a combination of highest bullock labour (41.21 hours) and lower tractor power (2.78 hours) was seen in lowest income group and lowest bullock labour (18.75 hours) and highest tractor power combination was seen in high income group (4.80 hours)

Puncha paddy

The relevant figures regarding the use of bullock labour and tractor power used for puncha paddy are given according to holding size groups in Appendix II, Tables 5 and 6.

For HYV paddy, the average bullock labour and tractor power used were 30.76 hours and 3.78 hours respectively. Among holding size group, a combination of highest bullock labour (49.4 hours) and lowest tractor power (2.01 hours) was used in large holding size group. Highest tractor power (6.85 hours) without bullock labour was used in medium size of holding group. Among income groups, more of bullock labour (40.04 hours) and less of tractor power (2.38 hours) was used in high income group and low level of bullock labour (20.41 hrs.)

and higher tractor power (4.82 hours) combination was used in lower income group.

In the case of traditional varieties, the average bullock labour and tractor power used were 21.64 hours and 3.97 hours respectively. Among holding size groups, higher bullock labour (55.73 hours) and less of tractor power (0.65 hours) were used in the smallest holding size group and lower bullock labour (4.9 hours) and highest tractor power (5.59 hours) were used in medium holding size. Among income groups higher bullock labour (44.2 hours) and lower tractor power was used in the lowest income group and lower bullock labour (10.14 hours) and higher tractor power (4.67 hours) were used in middle income group. The use of bullock labour and tractor power among holding size groups and income groups did not show any pattern of change in three season. This may be due to the fact that the use of bullock labour or tractor power depends on the availability of bullocks or tractor during the season rather than any other factor.

The average bullock labour and tractor power combination in different seasons are given in Table 6.1 for HYV paddy and traditional varieties. For HYV paddy the use of bullock labour continuously decreased and use of tractor power increased from Viruppu crop to Puncha crop. This is because of requirement of fine tilth for raising crop by broadcasting

Table 6.1. Utilization of labour per hectare for paddy in different seasons (Figures in hours)

Particulars	Viruppu	Mundakan	Puncha
HYV Paddy			
Family labour:			
Male	177.77	176.72	154.58
Female	18.76	14.43	44.00
Hired labour:			
Male	99.13	56.36	52.69
Female	519.77	384.13	251.03
Bullock labour	59.03	44.93	30.76
Tractor	1.98	2.79	3.78
Total labour:			
Male	276.90	233.08	207.27
Female	538.52	398.56	295.03
Traditional varieties			
Family labour:			
Male	154.35	136.85	110.78
Female	37.04	28.65	56.55
Hired labour:			
Male	116.64	76.45	77.02
Female	525.71	401.85	298.84
Bullock labour	43.90	26.47	21.64
Tractor	3.75	4.09	3.97
Total labour:			
Male	271.00	213.30	187.80
Female	562.75	430.50	355.39

which is the case in puncha crop and partially so in mundakan crop. In the case of traditional varieties also the use of bullock labour decreased from Viruppu crop to puncha crop. But there was no proportionate increase in the use of tractor power because of the change in number of ploughings, required for each crop. For the later crops, the number of ploughings required are less than the first crop. As a whole, the use of bullock labour use decreased from viruppu season to puncha season and tractor power increased. Another factor influencing, this was, perhaps the low proportion of bullock pairs in the study area to the total number of holdings which was hardly 7 per cent. It may be also due to fine tillage obtained from tractor ploughing.

Seed rate and transplantation

Seed rate for paddy varies with the type of sowing. For transplanting it will be lower than that of broadcasting. As Viruppu paddy is a transplanted crop, the seed rate used was lower. Mundakan paddy is a mixture of transplanted and direct sown crop. Puncha paddy is entirely a direct sown crop. There is a wide gap between the seed rate recommended and the rate used. The figures relating to seed rate per hectare in different holding size groups, and income groups used in different seasons are given in Table 6.2. It can be seen that the seed rates used were higher than the recommended one in almost all classes for every season. But variation is

Table 6.2. Per hectare seed rate used for paddy in different seasons in holding size groups and income groups

	Recommended	Holding size groups				
		Smallest	Small	Medium	Large	Average
HYV paddy						
Viruppu	60-85 kg	101.27	91.39	88.92	96.33	94.47
Mundakan	80-100 kg	135.45	78.60	78.80	100.00	98.21
Puncha	80-100 kg	148.50	138.02	131.72	123.00	135.31
Traditional varieties						
Viruppu	60-85 kg	111.15	93.86	93.56	101.27	99.96
Mundakan	80-100 kg	126.04	132.96	129.35	104.72	123.27
Puncha	80-100 kg	141.80	140.64	124.85	134.29	135.40

	Recommended	Income groups				
		Lowest	Lower	Middle	High	Average
HYV paddy						
Viruppu	60-85 kg	85.32	93.77	96.18	98.80	94.47
Mundakan	80-100 kg	123.50	84.97	107.81	76.57	98.21
Puncha	80-100 kg	134.30	143.20	132.04	131.70	135.31
Traditional varieties						
Viruppu	60-85 kg	100.80	96.77	97.15	105.19	99.98
Mundakan	80-100 kg	125.40	136.46	126.59	104.62	123.27
Puncha	80-100 kg	139.00	137.20	123.09	132.30	135.40

less in the case of viruppu which is a transplanted crop and avoids risk on the mainfield. The high seed rate was perhaps due to low germination percentage of the seeds used. Among the three seasons the seed rate was the highest in puncha season which averaged 135.31 kg/ha for HYV varieties and 135.40 kg/ha in the case of traditional varieties. The seed rate used in different holding groups and income groups did not show any pattern of change. As the germination percentage of the seeds used which are mainly farm produced is low, farmers are using sometimes seed rates double the quantity over recommended seed rate.

Use of fertilizers and manures

Farm yard manure use was common on the sample farms but the quantity used per hectare varied widely from farmer to farmer. The use of chemical fertilizers was also prominent on the sample farms. Generally, the emphasis was on nitrogen and lesser quantities of phosphorus and potassium were found to be used.

Fertilizer use in different holding size groups is shown in Table 6.3 and in different income groups in Table 6.4, both for HYVs and traditional varieties. Fertilizer use in different seasons are also given. For HYV paddy on an average nitrogen application was highest in the mundakan season which was 72.48 kg/ha and lowest in the puncha season with 60.77 kg/ha.

Table 6.3. Fertilizer use for paddy per hectare in different holding size groups (Figures in kg)

	Recommended	Smallest	Small	Medium	Large	Average
HYV paddy						
Nitrogen:						
Viruppu	90	104.1	63.05	66.69	47.47	70.32
Mundakan	90	126.53	54.60	58.06	50.75	72.48
Puncha	70	108.45	61.75	51.87	20.99	60.77
Phosphorus:						
Viruppu	45	32.50	29.22	26.72	21.48	27.48
Mundakan	45	25.81	14.72	16.10	17.24	18.47
Puncha	35	20.99	14.82	14.00	20.99	17.70
Potassium:						
Viruppu	45	32.50	34.30	26.72	19.98	28.38
Mundakan	45	16.25	14.72	9.73	18.80	14.88
Puncha	35	9.80	22.23	14.00	20.99	16.76
Traditional varieties						
Nitrogen:						
Viruppu	40	63.84	50.04	45.17	53.54	53.15
Mundakan	40	49.59	52.33	42.97	47.67	48.14
Puncha	40	75.58	58.76	41.22	58.66	58.56
Phosphorus:						
Viruppu	20	12.05	16.30	17.09	13.01	14.61
Mundakan	20	9.21	14.67	16.47	12.10	13.11
Puncha	20	11.55	19.24	15.93	14.37	15.27
Potassium:						
Viruppu	20	8.05	22.60	19.01	29.59	19.81
Mundakan	20	7.60	16.35	21.14	22.72	16.95
Puncha	20	13.09	23.36	19.58	26.67	20.68

Phosphorus application was highest in the viruppu season with 27.48 kg/ha and lowest in the puncha season (17.70 kg/ha). Potassium application was highest in the viruppu season with 28.38 kg/ha and lowest in the mundakan season (14.88 kg/ha).

For HYV paddy among holding size groups, the applied nitrogen exceeded the recommended rate only in the lowest holding size group in all three seasons, the figures for three seasons being 104.1 kg/ha, 126.53 kg/ha and 108.45 kg/ha for viruppu, mundakan and puncha respectively. In all the other holding size groups, the applied nitrogen was less than the recommended dose and it was only 20.99 kg/ha. in the large holding size group in puncha season which was the lowest. But in the case of phosphorus, the applied quantity was less than the recommended quantity in all the seasons and in all holding size groups. The highest quantity of phosphorus was applied in the smallest holding group in respective seasons. The figures for the three seasons for that class were 32.5 kg/ha, 25.81 kg/ha and 20.99 kg/ha for viruppu, mundakan and puncha crops respectively. In the case of potassium also the applied quantity is very much less than the recommended dose, in all the three seasons and in all the holding size groups. The highest quantity of potassium for viruppu crop was applied in small holding size group (34.30 kg/ha), for mundakan crop in the large holding size group (18.80 kg/ha) and for puncha in the small holding size group (22.23 kg/ha).

Among income groups the nitrogen applied was lower than the recommended level in all seasons and all income groups except in the lower income group during viruppu and mundakan seasons, where the applied quantities were 90.33 kg/ha and 109.10 kg/ha respectively. In the case of phosphorus and potassium also the applied quantities were less than the recommended levels. The highest quantity of phosphorus applied was during viruppu in lower income group (29.68 kg/ha) and in the case of potassium also it was during viruppu in lower income group (30.14 kg/ha). In general the application of fertilizers was much less than the recommended levels though in the case of nitrogen, application was more than recommended levels in certain holding groups and income groups. No consistent relationship between holding size and rate of application of fertilizers was found. Similarly no such relationship was observed in the case of income.

Traditional varieties

The figures relating to fertilizer application per hectare for traditional varieties are given in Table 6.3 for holding groups and Table 6.4 for income groups. Of the three seasons, average nitrogen application was highest for puncha paddy which was 58.56 kg/ha while it was lowest for mundakan paddy (48.14 kg/ha). The application of phosphorus was highest for puncha paddy which was 15.27 kg/ha and lowest for mundakan paddy (13.11 kg/ha). But there was not much difference among

Table 6.4. Fertilizer use for paddy per hectare in different income groups (Figures in kg)

	Recommended	Lowest	Lower	Middle	High	Average
HYV paddy						
Nitrogen:						
Viruppu	90	73.35	90.33	58.60	59.03	70.32
Mundakan	90	67.40	109.10	56.88	56.56	72.48
Puncha	70	67.30	46.80	59.28	69.68	60.77
Phosphorus:						
Viruppu	45	28.90	29.68	27.82	23.52	27.48
Mundakan	45	15.83	22.72	18.03	17.29	18.47
Puncha	35	25.83	19.07	-	25.90	17.70
Potassium:						
Viruppu	45	28.90	30.14	26.97	27.49	28.38
Mundakan	45	10.62	18.44	9.80	20.64	14.88
Puncha	35	23.50	19.07	-	24.45	16.76
Traditional varieties						
Nitrogen:						
Viruppu	40	54.09	56.72	45.48	56.30	53.15
Mundakan	40	48.65	53.38	45.63	44.90	48.14
Puncha	40	46.75	72.20	64.63	50.64	58.56
Phosphorus:						
viruppu	20	12.27	18.03	12.84	15.31	14.61
Mundakan	20	8.39	16.95	15.01	12.10	13.11
Puncha	20	12.80	17.17	15.32	15.80	15.27
Potassium:						
Viruppu	20	19.98	20.21	13.09	25.97	19.81
Mundakan	20	13.29	18.25	17.26	19.01	16.95
Puncha	20	16.80	25.86	18.06	21.98	20.68

three seasons. Potassium application was highest for puncha paddy (20.68 kg/ha) and lower for mundakan paddy (16.95 kg/ha).

Among holding size groups, the application of nitrogen was higher than the recommended level in all groups. Even in the smallest size group it was almost double the recommended dose. For viruppu paddy it was highest in smallest holding size group (63.84 kg/ha) and for mundakan paddy it was 52.33 kg/ha in the small holding size group and for puncha paddy it was 75.58 kg/ha in the smallest holding size group. But phosphorus application was below the recommended quantity in all holding size groups. The highest rate of application was 17.09 kg/ha for viruppu paddy in the medium holding size group as against the recommended dosage of 20 kg/ha. For mundakan paddy also the highest rate of application was in medium size holdings. For puncha too highest rate was in the small holding group.

Potassium usage showed high variability among seasons and also among holding classes. As against the recommended level of 20 kg/ha it was 29.59 kg/ha in the large holding group for viruppu paddy and as low as 8.05 kg/ha in the smallest holding size group. It was 22.72 kg/ha and 26.67 kg/ha in the large holding group for mundakan and puncha.

Among income groups, quantity of nitrogen used was higher than the recommended quantity in all income groups. For viruppu, mundakan and puncha crops nitrogen application

was highest in the lower income group with 56.72 kg/ha, 53.38 kg/ha and 72.2 kg/ha respectively. Phosphorus application was also highest in the lower income group for all three seasons, viz., viruppu, mundakan and puncha with 18.03 kg/ha, 16.95 kg/ha and 17.17 kg/ha respectively. But in all income groups it was less than the recommended level. Potassium application was around the recommended level for viruppu and mundakan in the high income group. For puncha crop it was 25.86 kg/ha in the lower income group, which was the highest and more than the recommended quantity. Among income groups, nitrogen application was more than the recommended level, phosphorus application far below the recommended level and that of potassium application around the recommended level.

Weeding

Weeding is mainly a labour intensive operation. Mostly hired women labour was engaged for this purpose. But on the small farms, the family men labour was also utilized for this purpose. The number of weedings varied from one to two. Weeding was done after 30-40 days after transplantation. On smaller farms, the number of weedings observed was two, whereas on large farms only one weeding was observed.

Irrigation and drainage

The three crops of paddy are grown under different climatic conditions. The first crop viruppu is a rainfed crop

grown during the south-west monsoon. Because of heavy rainfall during this season the main problem before the farmer is drainage, on all low lands. Water has to be drenched out of the fields by digging small drainage channels.

For mundakan crop, Peechi irrigation project supplies water to the farmers in this Ollukkara block. But those farmers who are not having irrigation facilities are also growing mundakan crop with the help of north east monsoon supplemented by irrigation, using water stored in tanks during monsoon.

Puncha, the third paddy crop is essentially an irrigated crop. As already stated except in the Panancherry panchayat, in all other parts of the Ollukkara block, puncha paddy is grown on small patches of land with the help of irrigation by electric pumpsets. The source of irrigation is well. But in the case of Panancherry panchayat puncha crop is grown with Peechi water which escapes from Right Bank Canal as seepage. Much attention is paid for raising this crop.

Plant protection

Seed treatment for paddy crop was not found on the sample farms. The use of chemical pesticides was also much less on the selected farms.

Harvesting, threshing, winnowing, etc.

For harvesting the paddy crop in all three seasons

generally hired women labour with three or four men labourers were employed. The payment was in kind as grain. The payment was for carrying out harvesting, threshing, winnowing and filling the bags. The total payment for all these operations was one-sixth of the total main product irrespective of the number of workers employed and number of days they work. As the legislation says that one-sixth of the main product or its value should be paid for harvesting and other operations, labour prefers grain rather than money. In harvesting operations workers generally did not keep any regular hours of work; depending upon the circumstance they either work for extended hours or they took long breaks. As paddy cultivation is highly labour intensive, the labour hours utilized per hectare in different holding size groups, income groups and for different seasons were computed and are presented in Appendix II Table 1 for holding size groups for viruppu paddy and in Table 2 for income groups. Tables 3 and 4 show the same for mundakan and Tables 5 and 6 for puncha paddy. But the total labour use per hectare presented does not include labour used for harvest.

In the case of HYV paddy grown during viruppu season, family labour (male and female) hours decreased with increase in size of holding. The average male family labour hours used were 177.77 and female family labour hours 18.76. Use of hired male labour hours increased with the increase in

size of holding and average hired male labour hours utilized were 99.13. In the case of hired female labour hours, the highest was in smallest size of holding group with 600.1 hours closely followed by large holding group with 599.67 hours and 430.21 hours and 449.09 hours in small and medium size holding groups. There was variation in this because of the variation in the number of weedings taken in different size groups. The average hired female labour hours used was 519.77.

Among income groups, also the contribution of family labour hours decreased and share of hired labour hours increased with increase in income.

For traditional varieties raised during viruppu season, the average family male and female labour hours used were 154.35 and 37.04 hours respectively. The average hired male and female labour hours used were 116.64 hours and 525.71 hours.

Among different holding size groups, the share of family labour both male and female hours decreased with increase in holding size and the share of hired male labour hours increased with size of holding. Use of hired female labour hours did not show any consistent pattern of change but its share was lowest in smallest size of holding and highest in small size of holding.

Among income groups, the share of family male and female labour hours decreased with increase in income and that of hired male and female labour hours increased. The share of family male and female labour hours in lowest income group was 249.3 male labour hours and 110.80 female labour hours and was lowest in the high income group with 79.12 male labour hours and 6.72 female labour hours.

The share of hired male labour hours was lower in the lowest income group (83.15 hours) and higher in the high income group (178.41 hours). Even the share of female hired labour also was lowest in the lowest income group (481.3 hours) and highest in the high income group (556.03 hours).

Mundakan paddy

The figures relating to the labour use for high yielding varieties and traditional varieties according to holding size groups and income groups are given in Appendix II, Tables 3 and 4.

In the case of high yielding varieties, the average share of family male labour was 176.72 hours and that of family female labour 14.43 hours. The average hired male labour was 56.36 hours and of hired female labour 384.13 hours. Among different holding size groups the share of family male labour hours decreased with increase in holding size except in the large holding size group where it increased marginally. The share of family female labour was highest

in medium holding size group and was lowest in the large holding size group. The share of hired male labour hours was lowest in the medium holding size group (27.21 hours) and was highest in large holding size group (91.51 hours). The share of hired female labour was highest in the smallest holding size group and lowest in small holding size group. This was because number of farms where transplantation method followed was higher in the smallest holdings group and lower in small holdings group. The shares of farms practising transplantation and farms following broadcasting was equal in medium and large holding size groups.

Among different income groups family male labour hours decreased consistently with increase in income. But family female labour did not show any such pattern. Hired male labour hours increased with increase in income and that of hired female labour hours varied according to the proportion of farms transplanting and farms broadcasting. Thennumber of farms following transplanting was highest in the lowest income group and lowest in middle income group.

In the case of traditional varieties grown in the mundakan season, the average family male labour hours and female labour hours used was 136.85 hours and 28.65 hours respectively. Average hired male labour hours utilized was 76.45 hours and that of female hired labour hours was 401.85. Proportion of family labour, both in male and female labour

decreased with increase in the holding size and hired male labour hours increased with holding size. Among the smallest, small and medium holding size groups there was no significant difference in the utilization of hired female labour hours.

Among income groups, the share of family labour decreased with increase in income and hired labour utilization increased with income.

Puncha paddy

For this crop labour utilization both male and female was lowest because this crop is raised by broadcasting method of sowing and for ploughing relatively more hours of tractor rather than bullock power was used. The relevant figure are given in Appendix II, Tables 5 and 6.

In the case of high yielding varieties grown during puncha season, the average family labour utilized was 154.58 of male labour and 44 hours of female labour. Hired male labour and hired female labour used were 52.69 hours and 251.03 hours respectively.

Family labour use decreased with increase in holding size in all but large holdings. Hired labour did not show any pattern. In medium sized holdings male labour utilization was lowest because of the absence of bullock labour use completely. The share of female hired labour, it was almost

same in all holding groups except in medium holding size group which might be due to number of weedings.

Among income groups, the share of family male and female labour hours decreased with increase in income and hired labour use increased with increase in income.

For traditional varieties grown in puncha season, the average family male labour hours and female labour hours utilized were 110.78 and 56.55 hours respectively and that of hired male and female labour hours were 77.02 and 298.84 in the same order. Average total male labour hours utilized was 187.8 and that of female labour 355.39.

Among holding size groups, the share of family labour declined sharply with the increase of holding size, in the case of both male and female labour. Hired male labour use was higher in large holding size group closely followed by the smallest holding size group, this is because of higher bullock labour use in these two holding groups. There was no significant variation among the holding size groups in the utilization of female hired labour.

Among income groups male and female labour hours of family decreased with increase in income. Hired male labour showed increase with increase in income. Hired female labour hours share also increased with increase in income. The utilization of total male and female labour hours per hectare was similar except in the highest income group where there was small increase in the use of labour.

The utilization of human labour in different seasons are given in Table 6.1. In the case of high yielding varieties, the utilization of male labour decreased from viruppu paddy to puncha paddy. This was because of shifting from bullock labour to tractor ploughing and to some extent due to change from transplanting to broadcasting. Total female labour use also decreased from viruppu to puncha due to shifting from transplanting to broadcasting and also due to change in number of weedings, in a particular season. In the case of traditional varieties also the same pattern of changes can be observed.

For HYVs, the total male labour utilized was 276.9 hours for viruppu, 233.08 hours for mundakan and 207.27 hours for puncha crop, whereas female labour hours were 538.52 hours, 398.56 hours and 295.03 hours for viruppu, mundakan and puncha crops respectively. In the case of traditional varieties, the total male labour utilized was 271 hours for viruppu, 213.3 hours for mundakan and 187.8 hours for puncha crop, whereas female labour utilized was 562.75 hours, 430.50 hours and 355.39 hours for viruppu, mundakan and puncha crops respectively.

COST OF CULTIVATION OF PADDY

Cost of cultivation here means the expenses incurred on cultivation per hectare of land. Cost of cultivation

of paddy has been worked out separately for each of the three seasons and for high yielding varieties and traditional varieties.

Viruppu paddy - high yielding varieties

The average per hectare cost of cultivation of high yielding varieties of paddy is presented in Appendix II, Tables 7 and 8. Table 7 shows the details inputwise and Table 8 shows the same operationwise. It can be seen that the total cost of cultivation (Cost C) in the study area was Rs.5692.11/ha. Costs A and B constituted 67.79 per cent and 92.92 per cent respectively of the total cost. The important inputs of expenditure were hired human labour, constituting 31.27 per cent of total cost, followed by expenditure on fertilizers, seeds and bullock labour constituting 9.74 per cent, 7.58 per cent and 7.36 per cent respectively. Average rental value of land was Rs.1371.44 which was imputed at the rate of one-fifth of the gross value of output and which constituted 24.09 per cent of the total cost. Cost of imputed family labour constituted 7.08 per cent of the total cost.

Among holding size groups, the proportion of expenditure on hired human labour increased with increase in the holding size, except in the medium holdings. It was 29.13 per cent of the total cost in the smallest holdings group

and it rose to 34.08 per cent in the large holdings group. The proportion of expenditure on bullock labour and tractor was highest in the smallest holdings group (8.32%) and lowest in the small holdings (5.94%). The expenditure on seeds was almost same in all holding size groups. Manures constituted 7.70 per cent of the total cost in the large holding size group whereas in small holding group it was 4.45 per cent of the total cost. Fertilizers constituted higher proportion in the small holding size (11.13%) and lowest in the large holdings group (7.55%). The expenditure on pestioides was less than one per cent of the total cost in all holding size groups. The proportion of cost A showed a declining trend except in the large holding size group, where it rose sharply to 70.36 per cent from 66.34 per cent of the medium holding size group. The cost of imputed family labour decreased with increase in holding size. Total cost was highest in the smallest holding size group where it was Rs.6160.25/ha lowest in the medium holding size group (Rs.5498.56/ha).

The proportion of expenditure on harvesting was highest of all operations constituting 13.99 per cent of the average total cost of all holding size groups. The proportion of expenditure on seeds and sowing was 13.75 per cent closely followed by expenditure on preparatary cultivation (13.59%). The proportion of expenditure on weeding was 5.59 per cent

and on drainage and irrigation 4.22 per cent of the total cost. Among holding size groups the proportion of expenditure on preparatory cultivation was highest in the small holding group with 15.01 per cent of the total cost and lowest in medium holding size group with 12.19 per cent. The proportion of expenditure on seeds and sowing varied between 13.03 per cent in medium holdings group to 14.50 per cent in the large holdings group. The proportion of expenditure on irrigation and drainage was 5.06 per cent of the total cost in the medium holdings group which was highest and 3.58 per cent in the large holdings group, which was the lowest. The expenditure on harvesting varied between 13.48 per cent (Rs.830.14) in the smallest holding size group to 14.44 per cent (Rs.793.96) in the medium holding size group.

The figures of cost of cultivation according to income groups are given in Tables 9 and 10 of Appendix II.

Among income groups, the proportion of expenditure on hired human labour increased with increase in income from 27.70 per cent of the total cost in the lowest income group to 33.63 per cent in the high income group. The proportion spent on bullock labour and tractor was lowest in the lower income group (6.33 per cent) and highest in the high income group (8.85%). The proportion spent on seeds and seedlings did not show much variation. The expenditure on manures

was highest in the middle income group constituting 7.15 per cent of the total cost whereas the proportion on fertilizers was highest in the lowest income group constituting 11.23 per cent. The expenditure on pesticides was less than one per cent in all income groups. Except in the lower income group, cost A showed an increasing trend with increase in income.

The expenditure on preparatory cultivation was highest in the middle income group constituting 14.49 per cent of the total cost and lowest in the high income group constituting 11.71 per cent of the total cost. Proportion of amount spent on seeds and sowing was highest in the middle income group constituting 15.18 per cent of the total cost. The expenditure on weeding varied between 7.14 per cent in the high income group to 4.11 per cent in the lowest income group. The expenditure on harvesting was 13.47 per cent in the middle income group and 14.43 per cent in the lower income group.

Yield and Returns

Per hectare production of grain, gross returns, benefit-cost ratio, cost per quintal of paddy production and net income at different costs are given according to holding size groups in Table 11 and income groups in Table 12 of Appendix II. The average quantity of paddy produced in the

viruppu season was 3267.74 kg/ha and 1583.75 bundle/ha of straw. The average gross returns were Rs.6457.17/ha. Average farm business income, family labour income and net income were Rs.2598.63, Rs.1168.08 and Rs.765.07 respectively. Benefit-cost ratio at cost A was 1.67, at cost B 1.22 and at cost C 1.13. Cost per quintal of paddy production at cost C was Rs.125.72. Among holding size groups, yield was highest in the smallest holding size group (3400.7 kg/ha) whereas it was the lowest in the large holding group (3157.57 kg/ha. The quantity of by-product (straw) varied from 1425 bundle/ha in the smallest holding size group to 1750 bundle/ha in the medium holding size group. Farm business income, family labour income and net income were highest in the medium holding size group. Benefit cost ratio at cost A, cost B and cost C was highest in the medium holding size group with 1.81 at cost A, 1.30 at cost B and at cost C 1.21. Cost per unit of output (at cost C) was highest in the smallest holdings group with Rs.139.24 per quintal and lowest in the medium holdings group where it was Rs.116.48 per quintal.

Among income groups yield of grain was highest in the lower income group which produced 3386.53 kg/ha and lowest in the middle income group (3146.18 kg/ha). Farm business income, family labour income and net income were highest in the lower income group with Rs.2914.67, Rs.1465.91 and

Rs.1027.21 and lowest in the middle income group. Benefit cost ratio was also highest in the lower income group at cost A (1.8). at cost B (1.29) and at cost C (1.19). Cost per unit of output (at cost C) was highest in the lowest income group (Rs.131.16) and lowest in the lower income group (Rs.115.92).

Traditional varieties

The cost of cultivation of traditional varieties in viruppu season is presented according to holding size groups in Tables 13 and 14 of Appendix II.

The average per hectare cost of cultivation (cost C) of traditional varieties in viruppu season was Rs.5212.90, as against Rs.5692/- for HYVs. Cost A and Cost B constituted 68.81 per cent and 91.67 per cent of the total cost respectively. The important inputs of expenditure were hired human labour, constituting 30.30 per cent of the total cost, followed by expenditure on bullock labour and tractor, seeds and fertilizers constituting 9.33 per cent, 8.46 per cent and 8.44 per cent respectively. Average rental value of the land was Rs.1132.36 which constituted 21.72 per cent of the total cost. Family labour constituted 8.33 per cent of the total cost.

Among holding size groups the proportion of expenditure on hired human labour increased with increase in the holding size from 27.07 per cent in the smallest holding size group

to 32.92 per cent in the medium holding size group, but it decreased to 31.97 per cent of the total cost in the large holding size group. The proportion spent on bullock labour was highest in the small holding size group constituting 10.03 per cent of the total cost and lowest in the medium size of holding constituting 8.75 per cent of the total cost. The expenditure on seeds and seedlings was highest in the smallest holding group (9.09 per cent) and lowest in the medium holding group (7.74 per cent). Expenditure on manures was 7.08 per cent in large sized holdings which was the highest. The expenditure on fertilizers did not show much variation. Expenditure on pesticides was less than one per cent in all holding size groups. The ratio of cost A to cost C increased with increase in the holding size from 65.37 per cent in the smallest holding size to 70.86 per cent in the large holding size group. The proportion of imputed family labour wages decreased with increase in the holding size. Total cost of cultivation in the smallest holding size was Rs.5511.67/ha and decreased to Rs.5080.29 in the large holding size group.

Among different operations the highest proportion was on preparatory cultivation constituting 15.41 per cent of the total cost closely followed by seeds and sowing (15.39%), harvesting (12.07%), weeding (5.86%) and drainage and irrigation (5.20%). Among holding size groups, the proportion of

expenditure on preparatory cultivation was highest in the smallest holding size group and lowest in the small holding size group constituting 16.98 per cent and 14.62 per cent of the total cost respectively. The proportion spent on seeds and sowing ranged between 14.83 per cent in the large holdings group and 15.85 per cent of the smallest holdings group. The proportion spent on weeding ranged between 5.36 per cent of the large holding size group and 6.35 per cent of the small holding size. The expenditure on irrigation varied between 4.47 per cent of the total cost on the large holding size farms to 6.12 per cent on the smallest holding size farms. The harvesting charges varied little among holding size groups.

The cost of cultivation figures according to income groups are given in Table 15 and 16 of Appendix II. Among income groups also the expenditure on hired human labour increased with increase in income. The expenditure on bullock labour and tractor varied between 8.78 per cent of the total cost in the high income group to 9.74 per cent in the lowest income group. The expenditure on seeds was lowest in the lower income group. Expenditure on manures was highest in the high income group constituting 7.21 per cent of the total cost whereas it was lowest in the lowest income group constituting 5.10 per cent of the total cost. The expenditure on fertilizers did not show much variation among income groups.

The expenditure on pesticides was less than one per cent in all income groups. The proportion of family labour in the total cost decreased with increase in income from 11.40 per cent of the total cost in the lowest income group to 5.27 per cent in the high income groups.

The expenditure on preparatory cultivation among the income groups was highest in the lowest income group and it was almost at the same proportion to total in other groups. The expenditure on seeds and sowing was highest in the middle income group constituting 15.92 per cent of the total cost and lowest in the high income group constituting 14.80 per cent of the total cost. The proportion spent on weeding was lowest in the high income group constituting 5.26 per cent and highest in the lower income group. The expenditure on irrigation and drainage was around 5 per cent of the total cost in all income groups and the proportion spent for harvesting was also around 12 per cent of the total cost in all income groups. The total cost showed a decrease with increase in income from Rs.5352.27 in the lowest income group to Rs.5123.67 in the high income group.

Yield and Returns

Per hectare production of grain, straw, gross returns, benefit cost ratio at cost A, B and C, cost per quintal of paddy production and net income at different costs are given

according to holding size groups in Table 17 and income groups in Table 18 of Appendix II.

The average quantity of yield per hectare of paddy in viruppu season for traditional varieties was 2619.64 kg with 1690 bundles of straw as against 3267.74 kg and 1583.75 bundle of paddy and straw respectively in HYVs. Average farm business income, family labour income and net income were Rs.1824.82, Rs.633.35 and Rs.198.89 respectively. Benefit cost ratio at cost A was 1.509, at cost B 1.133 and at cost C 1.038. The cost per quintal of paddy production at cost C was Rs.134.48, which was much higher than the cost of HYVs.

Among holding size groups, total grain production was highest in the large holding size which was 2728.14 kg/ha and lowest (2575.49 kg/ha) in the small holding size. Gross returns were highest in smallest holding size group (Rs.5513.93) and lowest in the small holding size group with Rs.5319.10. Farm business income and family labour income were highest in the smallest holding size giving net income of Rs.1910.86 and Rs.725.47 respectively. Net income was highest in the large holding size group. Benefit-cost ratio was highest in the smallest holding size at cost A and B with ratios of 1.53 and 1.152 respectively. But at cost C the ratio was highest in the large holdings group. The cost per quintal of grain production at cost C was Rs.146.80 in the smallest

holding size group and Rs.123.90 in the large holding size group which was the lowest.

Among income groups, grain yield was highest in the high income group with 2721.85 kg/ha and lowest in the middle income group with 2536.22 kg/ha. Highest gross income was achieved in the lower income group which was Rs.5463.60 and lowest was Rs.5367.27 in the high income group. Farm business income and family labour income were highest in the lower income group but net income was highest in the high income group (Rs.274.02). This was due to less utilization of family labour on high income group farms. Benefit cost ratio was also higher at cost A and cost B in the lower income group and at cost C in the high income group. The cost per quintal of paddy production was highest in the lowest income group reaching upto Rs.141.17 and lowest in the high income group (Rs.126.74).

Mundakan Paddy

This crop is raised between September-October to December-January. The crop mainly depends on North-east monsoon supplemented by the Peechi project water and water stored during south-west monsoon. The cost of cultivation of HYV varieties and traditional varieties are given separately.

HYV Varieties

The cost of cultivation of HYV varieties of paddy

according to holding size groups is presented in Tables 19 and 20 of Appendix II. It can be seen that the average total cost (cost C) of cultivation on the sample farms was Rs.5516.32 per hectare. Among the three paddy crops cost was lowest for mundakan. Costs A and B constituted 63.98 per cent and 91.60 per cent respectively. The important inputs of expenditure were hired human labour, constituting 29.99 per cent of the total cost, followed by fertilizers. Seeds and seedling and bullock labour and tractor constituted 9 per cent, 6.34 per cent and 6.33 per cent respectively. The expenditure on manures constituted 6.13 per cent of the total cost. Family labour constituted 8.40 per cent of the total cost.

Among holding size groups the proportion of expenditure on hired labour increased with increase in the holding size, except in the large holding group where there was a marginal fall but in absolute terms there was a slight increase in the large holdings group. Expenditure on bullock labourand tractor constituted as much as 8.17 per cent of the total cost in the small holding group, but it constituted only 4.94 per cent in the smallest holding group. The expenditure on seeds and seedlings was highest in the smallest holdings group and lowest in the small holding group. The proportion of expenditure on manures did not show any pattern. The proportion of expenditure on fertilizers was highest in the smallest holding size group (11.54%) whereas it was lowest in the small holding size size group (7.56%). During this season also the expenditure on

pesticides did not constitute even one per cent of the total cost, in any holding groups. Family labour constituted 12.43 per cent in the smallest holding size group which was highest. But it did not show any decreasing pattern with changes in the size of holding. The total cost decreased from Rs.5970.83/ha in the smallest holding size to Rs.5197.72/ha in the medium holding size group. But showed an increase in the large holding size group.

Among different operations, the average cost was highest on harvesting which contributed 15.37 per cent (Rs.847.76) of the average total cost followed by preparatary cultivation and seeds and sowing contributing 10.71 per cent (Rs.590.74) and 10.50 per cent (Rs.579.14) respectively. The average proportion spent on weeding was 7.33 per cent (Rs.404.30) of the total cost. Average expenditure on irrigation and drainage constituted 4.86 per cent of the total cost. Among different holding groups, the proportion of expenditure on preparatory cultivation was almost same in all holding groups (11%). The expenditure on seeds and sowing was highest in the smallest holding size group (12.73%) and lowest in the small holding size constituting 8.36 per cent of the total cost. This might be due to transplantation method followed in that group as explained earlier. The expenditure on weeding was almost same in all holding groups constituting 7 per cent of the total cost. Irrigation and drainage expenditure was also around 5 per cent of the total cost in all holding groups. The harvesting

charges contributed 16.08 per cent to total cost in the small holdings group whereas 14.31 per cent in the smallest holdings group which was the lowest.

The figures of cost of cultivation according to income groups are given in Tables 21 and 22 of Appendix II.

Among income groups, the expenditure on hired human labour increased with increase in income. The proportion of expenditure on bullock labour and tractor was almost same in all income groups constituting around 6.5 per cent of the total cost except in the lowest income group in which it was 5.55 per cent of the total cost. The expenditure on seeds and seedlings varied from 8.63 per cent of the total cost in the lowest income group which is highest and 5.23 per cent of the total cost in the lower income group was the lowest. The expenditure on manures constituted 4.78 per cent in the case of lowest income group whereas in lower income group it constituted 6.98 per cent of the total cost. The amount spent on fertilizers constituted 9.77 per cent in the lower income group which was the highest. The use of pesticides was completely absent in the lowest income group and in other income groups it did not constitute even one per cent of the total cost. Cost A was highest in the lower income group. Total cost varied much among income groups but it did not show any consistent pattern.

The proportion of expenditure on preparatory cultivation was highest in the lowest income group and highest in the

lower income group. But in absolute terms it was lowest in the high income group. The proportion of amount spent on seeds and sowing was highest in the lowest income group contributing 13.05 per cent to total cost whereas in the lower income group it was only 9.17 per cent. The proportion of expenditure on weeding did not show much variation among income groups. Harvesting constituted as much as 17.25 per cent (Rs.1055.95) of the total cost in the lower income group whereas in the lowest income group it constituted only 13.71 per cent (Rs.708.89) of the total cost.

Yield and returns

Per hectare production of grain, gross returns, benefit cost ratio, cost per quintal of grain production and net income at different costs are given according to holding size groups in Table 23 and income groups in Table 24 of Appendix II.

The average quantity of grain per hectare produced on the sample farms was 3454.93 kg with 1760 bundles of straw. The average gross returns were Rs.6897.42. Farm business income, family labour income and net income were Rs.3368.2, Rs.1844.61 and Rs.1381.10 respectively. The benefit cost ratio at cost A was 1.95, at cost B 1.37 and at cost C 1.25. The cost per quintal of paddy production was Rs.108.74. Thus HYV mundakan was much more remunerative than HYV viruppu.

Among holding size groups, per hectare production was highest (3470.80 kg/ha) in the smallest holdingsize group whereas it was lowest in the large holding size group (3430 kg/ha). But gross returns were highest in the small holding size group (Rs.7202.55) and lowest (Rs.6752.27) in the medium holding size group due to variation in price at which they sold. Farm business income was highest in the small holding size (Rs.3513.84), family labour income in medium holding size group (Rs.1981.95) and net farm income in the small holding size group (Rs.1581.92). Benefit cost ratio was highest in the medium holding size at cost A, B and C giving values of 2.07, 1.42 and 1.30 respectively. The cost per quintal of paddy production was highest in the smallest holding size group (Rs.126.22) and lowest in the medium holding size group (Rs.99.18).

Among income groups highest grain production per hectare was in the lower income group (3542.50 kg) and lowest in the middle income group (3379.90 kg). Gross returns were highest in the lower income group giving Rs.7266/ha whereas in the lowest income group gross returns were lowest giving only Rs.6625/ha. Farm business income and family labour income were highest in the lowest income group, Rs.3510.09 and Rs.2058.10 respectively. But net farm income was highest in the high income group (Rs.1489.03/ha). But benefit cost ratios

at cost A, B and C were highest in lowest income group viz., 2.13, 1.45 and 1.28 respectively. Cost per quintal of paddy production was highest in the lower income group (Rs.121.75) and lowest in the middle income group (Rs.102.06).

Traditional varieties

Information on cost of cultivation of traditional varieties in mundakan season is presented according to holding size groups in Tables 25 and 26 of Appendix II. Table 25 shows details inputwise and Table 26 shows the same operation-wise. The average total cost of cultivation (cost C) per hectare on the sample farms was Rs.4801.17. Cost A and B constituted 64.49 per cent and 92.09 per cent of cost C respectively. The important inputs of expenditure were hired human labour constituting 27.34 per cent of the total cost followed by expenditure on bullock labour and tractor, fertilizers, manures and seeds and seedlings, constituting 8.52 per cent, 8.13 per cent, 7.44 per cent and 6.43 per cent respectively. Water cess constituted only 0.46 per cent of the total cost and pesticides 0.54 per cent. Rental value of own land constituted 26.37 per cent of the total cost (Rs.1266.26). Family labour constituted 7.91 per cent of the total cost.

The proportion of expenditure on hired human labour increased with increase in the holding size. The expenditure on bullock labour and tractor was lowest in the medium holdings

group constituting 7.97 per cent and highest in the large holding size group constituting 9.38 per cent of the total cost. The expenditure on seeds and seedling was around 6.6 per cent of the total cost in all holding size groups except in medium holding group where it constituted only 5.54 per cent of the total cost. The expenditure on manures was lowest in the small holding size group constituting 5.98 per oent of the total cost. But fertilizers constituted 9.01 per cent of the total cost in that group. In the smallest holding size group the expenditure on manures constituted 7.92 per cent of the total cost and expenditure on fertilizers constituted lowest proportion (7.01 per cent) in that holding size group. Pesticides constituted less than one per cent of the total cost in all holding size groups. Cost A increased with increase in holding size from 60.38 per cent of the total cost in the smallest holding size group to 69.07 per cent of the total cost in the large holding size group. Family labour constituted 13.38 per cent of the total cost in the smallest holding size group and it was only 3.97 per cent of the total cost in the large holding size group. Total cost decreased with holding size except in large holding size group where it increased to Rs.4994.15 from Rs.4642.85 of medium holding size group.

The average expenditure among different operations was highest on harvesting constituting 14.05 per cent of the total

cost followed by preparatory cultivation, seeds and sowing, and manures and application, constituting 11.70 per cent, 9.54 per cent and 9.24 per cent of the total cost respectively. Weeding constituted 6.68 per cent of the total cost. Irrigation and drainage constituted 5.63 per cent of the total cost.

Among holding size groups, the proportion of expenditure on preparatory cultivation was highest in the smallest holding size group constituting 12.29 per cent and lowest in the medium holding size group constituting 10.98 per cent. The proportion of expenditure on seeds and sowing was lowest in the medium holding size group and highest in the large holding size group constituting 7.66 per cent and 10.82 per cent respectively. Expenditure on irrigation and drainage was decreased with increase in the holding size. The proportion of expenditure on harvesting was lowest in the smallest holding size group and highest in medium holding size group.

The cost of cultivation figures according to income groups are given in Table 27 and 28 of Appendix II. Table 27 shows the details inputwise and Table 28 shows the same in operationwise. Among income groups, the expenditure on hired human labour increased with increase in income from 24.47 per cent of the total cost in the lowest income group to 30.31 per cent in the high income group. The proportion of expenditure on bullock labour and tractor was highest in the middle

income group (9.45%) and lowest in the lowest income group (7.82%). The expenditure on seeds and seedlings was not very much different among income groups. The proportion of expenditure on manures showed an increase with increase in income except in the highest income group where there was marginal decrease in the proportion spent on manures. But in absolute terms there was a marginal increase. Proportion of expenditure on fertilizers was highest in the lower income group constituting 9.64 per cent of the total cost and lowest in the middle income group constituting 7.37 per cent of the total cost. Pesticides did not constitute even one per cent of the total cost in any class. Cost A increased with increase in income. The proportion of it to Cost C increased from 59.04 per cent in the lowest income group to 68.93 per cent in the middle income group. Family labour constituted 13.92 per cent of the total cost in the lowest income group whereas in the high income group constituted only 3.96 per cent of the total cost showing a declining trend with increase in income. Even though cost A increased with increase in income, cost C decreased with increase in income from Rs.4826.85 of the lowest income group to Rs.4721.82 in middle income group. But there was increase in the total cost in the high income group to Rs.4915.00.

Among different income groups, the expenditure on preparatory cultivation was highest in the lowest income group

and lowest in middle income group. The proportion of expenditure on seeds and sowing was lowest in the middle income group (8.73%) and highest in the high income group (10.92%). The expenditure on weeding varied between 6.17 per cent of the total cost in the highest income group to 7.35 per cent, of the lowest income group. The proportion of expenditure on harvesting did not vary much among income groups.

Yield and Returns

Per hectare production of grain, gross returns, benefit cost ratio, cost per quintal of grain production and net income at different costs are given according to holding size groups in Table 29 and income groups in Table 30 of Appendix II.

The average quantity of grain per hectare produced on sample farms was 2718.65 kg with 1753.75 bundles of straw during mundakan season. The average gross returns were Rs.5681.30 per hectare. Farm business income, family labour income and net farm income were Rs.2585.15, Rs.1259.78 and Rs.880.13 per hectare respectively. The benefit cost ratio at cost A was 1.835, at cost B 1.285 and at cost C it was 1.183. The cost per quintal of paddy (cost C) was Rs.112.09.

Among holding size groups, yield and gross returns were highest in the large holding size group and lowest in the smallest holding size group. Farm business income, family labour income and net farm income were highest in the medium holding size group. Benefit cost ratios at costs A and B were

highest in the small holding size group and at cost C in medium holding size group. The cost per quintal of grain production at cost C was highest in the smallest holding size group (Rs.121.23) and lowest in the small holding size (Rs.107.10).

Among income groups, yield and gross returns were highest in the middle income group and lowest in the lowest income group. Farm business income and family labour income were highest in the lowest income group but net farm income was highest in the middle income group. Benefit cost ratio was also highest at Cost A and B in the lowest income group, 1.962 at cost A and 1.346 at cost B. But at cost C it was highest in the middle income group (1.221). The cost per quintal of grain production was highest in the high income group (Rs.115.99) and lowest in the middle income group (Rs.108.35).

Puncha paddy

The crop is raised between December-January to March-April. This is also called as summer crop. This crop is irrigated by wells with the help of pumpsets except in the Panancherry area of the study area. The cost of cultivation of HYV varieties and traditional varieties are given separately.

High yielding varieties

The cost of cultivation of high yielding varieties of

paddy according to holding size groups is presented in Tables 31 and 32 of Appendix II. Table 31 shows the details inputwise and Table 32 shows the same operationwise. It can be seen that the average cost of cultivation of puncha crop on the sample farms was Rs.5615.26/ha and the same was in the neighbourhood of the cost for viruppu crop. Cost A and B constituted 62.95 per cent and 92.68 per cent respectively. The important inputs were hired labour constituting 26.14 per cent (Rs.1467.86) of the total cost followed by fertilizers, manures, bullock labour and irrigation constituting 8.62 per cent (Rs.483.79), 6.32 per cent (Rs.354.71), 6.13 per cent (Rs.344.43) and 5.49 per cent (Rs.308.52) respectively. The expenditure on seeds, pesticides, miscellaneous items, depreciation and interest on working capital constituted 4.13 per cent, 0.84 per cent, 1.05 per cent, 1.81 per cent and 2.42 per cent respectively. Rental value of own land constituted 28.62 per cent of the total cost. Imputed cost of family labour constituted 7.32 per cent of the total cost.

Among holding size groups, the proportion of expenditure on hired labour increased with increase in the holding size, from 23.45 per cent in the smallest holding size group to 28.40 per cent in the large holding size group. The expenditure on bullock labour did not show any pattern. The proportion of expenditure on manures increased with increase in holding size except in the smallest holding group. The proportion

of expenditure on fertilizers declined with increase in holding size. The expenditure on pesticides was 1.43 per cent of the total cost in the large holding size group and in other size groups it was less than one per cent of the total cost.

Irrigation constituted as much as 8.10 per cent (Rs.442.63) in the small holding size group, because of pumpset usage and it was only 0.58 per cent (Rs.30.80) in the medium holding size group reflecting the fact that in this group most farms were from Panancherry panchayat, where water is obtained through seepage from R.B.C. of Peechi project. Depreciation constituted around 2 per cent of the total cost in all holding size groups except in the large holding size group where it constituted only 1.15 per cent of the total cost. Cost A decreased with increase in the holding size except in the large holding size group where it increased. Cost of family labour decreased with increase in the holding size except in the large holding size group where its proportion increased. The total cost also decreased with increase in the holding size except in the large holding size group where it slightly rose.

Among different operations, the average cost was highest on harvesting which constituted 17.75 per cent (Rs.996.91) of the total cost followed by preparatory cultivation and irrigation constituting 9.40 per cent and 9.13 per cent respectively.

The average expenditure on weeding was 5.25 per cent of the total cost and that of seeds was 4.89 per cent.

Among holding size groups, the proportion of expenditure on preparatory cultivation increased with holding size except in the small holding size group. The expenditure on seeds varied between 5.37 per cent (Rs.293.48) in the small holding size group to 4.39 per cent (Rs.237.73) in the large holding size group. Irrigation constituted only 3.68 per cent (Rs.195.45) of the total cost in the medium size of holding and it was as much as 12.79 per cent (Rs.698.37) of the total cost in the small holding size group. The proportion of expenditure on harvesting was 16.25 per cent (Rs.1018.18) of the total cost in the smallest holding size group the lowest among the holding size groups and it was 19.16 per cent (Rs.1046.42) of the total cost in the small holding size groups and this was the highest.

The figures of cost of cultivation according to income groups are given in Tables 33 and 34 of Appendix II. Table 33 shows the details inputwise and Table 34 shows the same in operationwise. Among income groups, the expenditure on hired human labour was around 25 per cent of the total cost in the first three income groups, but in the high income group it constituted 28.56 per cent of the total cost. But in absolute terms, there was a steady increase in the expenditure on hired

human labour with increase in income. The proportion of expenditure on bullock labour was as low as 3.73 per cent in the middle income group and as high as 8.30 per cent in the high income group. The proportion of expenditure on manures varied from 4.43 per cent in the lower income group to 8.30 per cent in the high income group. The expenditure on fertilizers was highest in the lower income group. Pesticides were not used in the middle income group whereas in other income group even though pesticides were used, they constituted only around one per cent of the total cost. Irrigation constituted as much as 11.52 per cent (Rs.722.96) in the middle income group whereas in the high income group it was a meagre 0.55 per cent of the total cost. The proportion of family labour cost to total cost decreased consistently with increase in income. The total cost increased with increase in income except in the high income group where it decreased to Rs.5554.58 from Rs.6276.32 in middle income group.

Among income groups, the proportion of expenditure on preparatory cultivation was highest in the lowest income group constituting 10.86 per cent of the total cost and lowest in the middle income group constituting 8.00 per cent of the total cost. The expenditure on seeds and sowing was also highest in the lowest income group constituting 5.92 per cent of the total cost and lowest in the middle income group, constituting 4.11 per cent of the total cost. The expenditure on irrigation

was as high as 14.52 per cent of the total cost (Rs.911.47) in the middle income group and it was only 3.97 per oent of the total cost in the high income group. The proportion of expenditure on harvesting was highest in the lower income group and lowest in the lowest income group.

Yield and Returns

Per hectare production of grain, gross returns, benefit cost ratio, cost per quintal of grain production and net income at different costs are given according to holding size groups in Table 35 and income groups in Table 36 of Appendix II.

The average quantity of grain per hectare produced on sample farms was 3554.13 kg and that of straw 1842.50 bundles. Grain yield was the highest for this crop. Gross returns were also highest for this crop. The average gross returns were Rs.7526.55. Farm business income, family labour income and net farm income were Rs.3991.61, Rs.2322.19 and Rs.1911.29 respectively. These figures were also higher than those for viruppu and mundakan. The average benefit cost ratio for puncha crop at cost A was 2.129, at cost B 1.446 and at cost C 1.340. The cost per quintal of paddy production was Rs.106.15 as against Rs.125.72 for viruppu and Rs.108.74 for mundakan.

Among holding size groups yield was highest in the medium holding size group (3620 kg/ha) and lowest in the

smallest holding group (3481.16 kg/ha). Gross returns were also highest in the medium holding group Rs.7685.00. Farm business income, family labour income and net farm income were highest in the medium holding size group. Benefit cost ratio was also highest in the medium holding size group at cost A, B and C being 2.322, 1.529 and 1.445 respectively. The cost per quintal of paddy production was highest in the smallest holding size group (Rs.129.23) and lowest in the medium holding size group (Rs.97.15).

Among income groups, highest yield was in the high income group (3624.00 kg/ha) and lowest in the lowest income group (3267.50 kg/ha). Gross returns were highest in the lower income group (Rs.8139.00/ha) and lowest in the lowest income group (Rs.6300.25/ha). Farm business income. family labour income and net farm income were highest in the lower income group being Rs.4491.95, Rs.2688.94 and Rs.2283.29 respectively. Benefit cost ratio was also highest in the lower income group. At cost A, it was 2.232,at cost B 1.493 and at cost C 1.390. But cost per quintal of paddy grain was lowest in the lowest income group (Rs.92.27) and highest in the middle income group (Rs.123.38).

Traditional varieties

The cost of cultivation of traditional varieties in puncha season is presented according to holding size groups in Table 37 and 38 of Appendix II. Table 37 shows details inputwise and Table 38 shows the same operationwise.

The average total cost of cultivation of traditional varieties, in the puncha season was Rs.4793.69/ha. Cost A and B constituted 63.70 per cent and 94.08 per cent in the same order. The important inputs of expenditure were hired labour constituting 27.41 per cent (Rs.1313.59) of the total cost followed by expenditure on fertilizers, bullock labour, manures and seeds constituting 9.41 per cent, 7.01 per cent, 6.5 per cent and 4.88 per cent respectively. Pesticides, irrigation and miscellaneous items constituted 0.38 per cent, 2.5 per cent and 1.04 per cent respectively. Rental value of land constituted 29.15 per cent and family labour constituted 5.92 per cent of the total cost.

Among different holding size groups, the proportion of expenditure on hired human labour, increased with increase in holding size except in the smallest holdings. The proportion of expenditure on bullock labour and tractor did not show any consistent pattern. The expenditure on seeds constituted around 5 per cent of the total cost in all holding size groups. The expenditure on manures varied from 4.65 per cent (Rs.228.12) in the small holding size group to 8.68 per cent (Rs.423.60) in the large holding size group. The expenditure on fertilizers also did not vary much. Expenditure on irrigation varied from 1.24 per cent in the smallest holding group to 4.67 per cent of the small holding group. Family labour constituted 10.19 per cent in the smallest

holding size group and 3.07 per cent in the large holding size group. Total cost decreased with increase in the holding size except in the large holding size group where it increased to Rs.4877.79 from Rs.4409.71 in medium holding size group.

Among different operations the average expenditure on harvesting was highest constituting 16.80 per cent of the total cost followed by preparatory cultivation, irrigation and drainage, weeding and seeds and sowing.

Among holding size groups the proportion of expenditure on preparatory cultivation varied between 11.24 per cent in the smallest holding group and 8.58 per cent in the medium holdings group. The proportion of expenditure on seeds and sowing did not show much variation among holding size groups. Even in the case of weeding expenditure among holding size groups its proportion did not show much change. The proportion of expenditure on irrigation was lowest in the larger holding size group and highest in the small holding size group. The cost of harvesting was highest in the medium holding size group and lowest in the smallest holding size group.

The figures of cost of cultivation according to income groups are given in Tables 39 and 40 of Appendix II. Table 39 shows the details inputwise and Table 40 shows the same operationwise.

Among income groups, the proportion of expenditure on hired human labour increased with increase in income. Bullock labour cost did not show any pattern. The proportion of expenditure on seeds varied between 4.61 per cent in the lowest income group to 5.3 per cent in the middle income group. The expenditure on manures and fertilizers were highest in the high income group constituting 8.85 per cent and 10.59 per cent of the total cost. Expenditure on irrigation was lowest in the high income group and highest in the lowest income group. Family labour cost decreased with increase in income. Total cost also decreased with increase in income except in the high income group, where it increased to Rs.4979.38 from Rs.4434.87 of middle income group.

Among different income groups, the proportion of expenditure on preparatory cultivation was highest in the lowest income group (10.84 per cent) and lowest in the high income group (9.74 per cent). The expenditure on seeds and sowing varied between 5.55 per oent to 6.05 per cent among income groups. But in absoluted terms it was highest in the high income group. The expenditure on weeding also did not vary much among income groups. Harvesting cost varied between 17.32 per cent in the middle income group and 16.17 per cent in the lowest income group.

Yield and Returns

Per hectare production of grain, gross returns, benefit cost ratio, cost per quintal of grain production and net income at different costs are given according to holding size groups in Table 41 and income groups in Table 42 of Appendix II.

The average of grain production on sample farms was 2780.25 kg/ha of grain and 1700 bundles of straw. The gross returns were Rs.6186.38. Farm business income, family labour income and net farm income were Rs.3132.79, Rs.1676.40 and Rs.1392.69 respectively. Benefit cost ratio at cost A was 2.026 at cost B 1.372 and at cost C 1.291 as against 2.129, 1.446 and 1.340 for HYVs. Cost per quintal of paddy grain production was Rs.111.27.

Among holding size groups yield was highest in the large holding size group (2806 kg/ha) and lowest in the smallest holding size group (2755 kg/ha). Farm business income, family labour income and net farm income and benefit cost ratios were highest in the medium holdings group. This was due to better price received by them. Cost per quintal of paddy production was highest in the smallest group of farms (Rs.118.96) and lowest in the medium size group (Rs.95.32).

Among income groups grain production per hectare was highest in the high income group (2894 kg) and lowest in

the lowest income group (2724 kg/ha). Farm business income, family labour income and net farm income were highest in the lower income group. Benefit cost ratio also was highest in the lower income group at cost A, B and C. Cost per quintal of paddy production was highest in the lowest income group whereas it was lowest in the middle income group.

A comparative study of cost of cultivation of paddy in three seasons

The cost of cultivation of paddy in three seasons varied because of conditions under which they were grown differed, among seasons. The cost of cultivation of high yielding varieties and traditional varieties are studied separately.

High yielding varieties

Data on cost of cultivation per hectare in the 3 different seasons are presented in Tables 6.5 and 6.6. Table 6.5 shows the costs inputwise whereas Table 6.6 shows them operationwise. Cost C was highest for viruppu and lowest for mundakan. The cost on the hired human labour decreased consistently from viruppu to puncha not only proportionately but also in absolute terms. The fall in cost of this item was because of shift from the use of bullock labour to tractor power on one hand and the reduction in the number of ploughings. Expenditure on bullock

Table 6.5. Inputwise cost of cultivation of HYV paddy per hectare in different seasons (Figures in Rupees)

Particulars	Viruppu	Mundakan	Puncha
Hired human labour	1779.60 (31.27)	1653.70 (29.99)	1467.86 (26.14)
Bullock labour/Tractor	418.90 (7.36)	349.27 (6.33)	344.43 (6.13)
Seeds and seedlings	431.26 (7.58)	349.57 (6.34)	232.08 (4.13)
Manures	344.89 (6.06)	338.37 (6.13)	354.61 (6.32)
Fertilizers	554.25 (9.74)	496.23 (9.00)	483.79 (8.62)
Pesticides	38.79 (0.68)	36.43 (0.66)	47.06 (0.84)
Irrigation	-	28.24 (0.51)	308.52 (5.49)
Miscellaneous	40.75 (0.72)	39.96 (0.72)	58.98 (1.05)
Depreciation on implements	101.72 (1.79)	101.72 (1.84)	101.72 (1.81)
Interest on working capital	148.40 (2.61)	135.74 (2.46)	135.96 (2.42)
Cost A	3858.54 (67.79)	3529.22 (63.98)	3534.94 (62.95)
Rental value of own land	1371.44 (24.09)	1464.48 (26.55)	1610.31 (28.68)
Interest on fixed capital	59.11 (1.04)	59.11 (1.07)	59.11 (1.05)
Cost B	5289.09 (92.92)	5052.81 (91.60)	5204.36 (92.68)
Imputed family labour wages	403.02 (7.08)	463.52 (8.40)	410.91 (7.32)
Cost C	5692.11 (100.00)	5516.32 (100.00)	5615.26 (100.00)

Figures in parenthesis are percentages to total

HYV = High yielding variety

Table 6.6. Operationwise cost of cultivation of HYV paddy per hectare in different seasons (Figures in Rupees)

Particulars	Viruppu	Mundakan	Puncha
Preparatory cultivation	773.67 (13.59)	590.74 (10.71)	527.69 (9.40)
Seeds and sowing	781.62 (13.13)	579.14 (10.50)	274.34 (4.89)
Weeding	318.36 (5.59)	404.30 (7.33)	294.89 (5.25)
Plant protection	67.83 (1.19)	65.39 (1.19)	84.28 (1.50)
Manures and application	415.68 (7.30)	424.49 (7.70)	447.49 (7.97)
Fertilizers and application	577.32 (10.14)	535.53 (9.71)	511.15 (9.10)
Irrigation and drainage	239.99 (4.22)	267.97 (4.86)	512.50 (9.13)
Harvesting etc.	796.24 (13.99)	847.76 (15.37)	996.91 (17.75)
Miscellaneous	40.75 (0.72)	39.96 (0.72)	58.98 (1.05)
Depreciation on implements	101.72 (1.79)	101.72 (1.84)	101.72 (1.81)
Interest on working capital	148.40 (2.61)	135.74 (2.46)	135.96 (2.42)
Less family wages	403.02 (	463.52	410.91
Cost A	3858.54 (67.79)	3529.22 (63.98)	3534.94 (62.95)
Rental value on own land	1371.44 (24.09)	1464.48 (26.55)	1610.31 (28.68)
Interest on fixed capital	59.11 (1.04)	59.11 (1.07)	59.11 (1.05)
Cost B	5289.09 (92.92)	5052.81 (91.60)	5204.36 (92.68)
Imputed family labour wages	403.02 (7.08)	463.52 (8.40)	410.91 (7.32)
Cost C	5692.11 (100.00)	5516.32 (100.00)	5615.26 (100.00)

Figures in parenthesis are percentages to total

HYV = High yielding variety

labour and tractor also showed a similar pattern and for the same reasons. The cost of seeds and seed materials also decreased consistently from viruppu to puncha and in fact in the latter season it was hardly one-half of the cost of the same in the former season. This was mainly due to the change from transplanting in viruppu season to broadcasting in puncha on the method of sowing. Cost of manures did not show much variation among season, but cost of fertilizers showed a declining tendency both proportionately and in absolute terms. Expenditure on pesticides was marginally higher during puncha than in the other two seasons.

In the viruppu there was no irrigation and it was marginal in mundakan season but in puncha season it represented more than 5 per cent of the total cost and nullified the effect of low cost of human factor during this season on the total cost.

Cost A declined from Viruppu to puncha. It was 67.79 per cent (Rs.3858.54) of the total cost in the viruppu 63.98 per cent (Rs.3529.22) in the mundakan and 62.95 per cent (Rs.3534.94) in the puncha. Rental value of the land increased from viruppu to puncha reflecting the fact that gross returns increased from season to season. There was

no significant variation in the imputed cost of family labour among the three seasons.

Among 3 seasons expenditure on preparatory cultivation decreased consistently from viruppu to puncha season showing the partial shift from the use of bullock labour to tractor and reduction in the number of ploughings also. The expenditure on seeds and sowing showed a remarkable decrease from viruppu to puncha. This was due to the change in the method of sowing from transplanting to broadcasting. In spite of the fact that puncha was substantially a broadcasted crop, the cost of weeding was lowest in puncha both relatively as well as absolutely.

The expenditure on irrigation and drainage was almost same in viruppu constituting 4.22 per cent in viruppu and 4.86 per cent in mundakan, the small difference was due to payment of water cess during mundakan. But in puncha it was 9.13 per cent of the total cost due to the use of pumpset for irrigation on most of the farms. Cost of harvesting also increased from viruppu to puncha, reflecting the increase in grain yield, as the payment was in kind and also because the better quality of grain in the later seasons fetching better price.

The total cost without taking rental value into account showed a decrease from Rs.4320.67 in viruppu season to Rs.4051.84 in mundakan season and to Rs.4004.95 in puncha season.

Yield and returns

Per hectare yield, gross returns, income at different costs, benefit cost ratio at different costs and cost per quintal of paddy grain of 3 seasons are given in Table 6.7.

It can be seen from table that the quantity of grains produced per hectare increased from 3267.74 kg/ha in viruppu to 3454.33 kg/ha in mundakan to 3554.13 kg/ha in puncha. Gross returns per hectare was Rs.6457.17 in viruppu, Rs.6897.42 in mundakan and Rs.7526.55 in puncha. Farm business income, family labour income and net farm income were highest in the puncha season being Rs.3991.61, Rs.2322.19 and Rs.1911.29 respectively. Benefit cost ratio was highest in the puncha season. The cost per quintal of paddy in viruppu, mundakan and puncha was Rs.125.72, Rs.108.74 and Rs.106.15 respectively at cost C. The cost per quintal of paddy at total cost excluding rental value of land in viruppu, mundakan and puncha was Rs.83.76, Rs.66.34 and Rs.60.84 respectively. Though the total cost incurred in different inputs except irrigation was almost same in all three seasons, gross returns and net returns varied widely among the seasons because of changes in the total yield of grain and straw as well as quality of both. These were influenced by climatic conditions prevailing in different seasons.

Table 6.7. Per hectare yield and measurement of income at different costs of HYV paddy in different seasons

Particulars	Viruppu	Mundakan	Puncha
Quantity of grain (kg)	3267.74	3454.33	3554.13
Quantity of byproduct (bundles)	1583.75	1760.00	1842.50
Value of grain (Rs)	4873.42	5137.42	5684.05
Value of byproduct (Rs)	1583.75	1760.00	1842.50
Gross value (Rs)	6457.17	6897.42	7526.55
Farm business income (Rs)	2598.63	3368.20	3991.61
Family labour income (Rs)	1168.09	1844.61	2322.19
Net income (Rs)	765.07	1381.10	1911.29
Income at cost C excluding rental value of land	2136.50	2845.58	3521.60
Cost benefit ratio at Cost A	1.67	1.95	2.13
Cost B	1.22	1.37	1.45
Cost C	1.13	1.25	1.34
Cost C excluding rental value of land	1.494	1.702	1.879
Cost/quintal of grain at cost C (Rs)	125.72	108.74	106.15
Cost/quintal of paddy at oost C excluding rental value of land (Rs)	83.76	66.34	60.84

Traditional varieties

The cost of cultivation per hectare of traditional varieties in 3 different seasons is presented in Table 6.8 and Table 6.9, while table 6.8 shows the costs inputwise and Table 6.9 shows the same operationwise. Cost C was highest for viruppu and lowest for puncha. The proportion of expenditure on hired human labour decreased from 30.30 per cent (Rs.1579.78) in viruppu to 27.34 per cent (Rs.1312.70) in mundakan and there was no significant difference on this cost between mundakan and puncha. Cost on bullock labour and tractor also decreased consistently from viruppu to puncha season. Expenditure on seeds and seed material also decreased due to shift from transplanting to broadcasting. Expenditure on manures did not show much variation. The same was the case with expenditure on fertilizers. The irrigation cost increased from nil in viruppu to 2.5 per cent of the total cost in puncha.

Cost A in viruppu was Rs.3586.97 (68.81 per cent), Rs.3096.15 (64.40 per cent) in mundakan and Rs.3053.59 (63.70 per cent) in puncha season. Imputed cost of family labour did not show significant variation between viruppu and mundakan seasons. However it was substantially less in puncha season. This phenomenon is rather strange because the area under paddy in puncha season being much less than in other seasons one would expect more use of family labour

Table 6.8. Inputwise cost of cultivation of TV paddy per hectare in different seasons (Figures in Rs)

Particulars	Viruppu	Mundakan	Puncha
Hired human labour	1579.78 (30.30)	1312.70 (27.34)	1313.59 (27.41)
Bullock labour/ Tractor	486.61 (9.33)	408.94 (8.52)	336.12 (7.01)
Seeds and seedling	440.91 (8.46)	308.52 (6.43)	233.97 (4.88)
Manures	326.80 (6.27)	357.05 (7.44)	311.76 (6.50)
Fertilizers	440.11 (8.44)	390.48 (8.13)	451.07 (9.41)
Pesticides	30.09 (0.58)	25.76 (0.54)	18.38 (0.38)
Irrigation	-	22.26 (0.46)	119.94 (2.50)
Miscellaneous	42.99 (0.82)	49.65 (1.03)	49.62 (1.04)
Depreciation on implements	101.72 (1.95)	101.72 (2.12)	101.72 (1.68)
Interest on working capital	137.96 (2.65)	119.08 (2.48)	117.45 (2.12)
Cost A	3586.97 (68.81)	3096.15 (64.49)	3053.59 (63.70)
Rental value of own land	1132.36 (21.72)	1266.26 (26.37)	1397.28 (29.15)
Interest on fixed capital	59.11 (1.13)	59.11 (1.23)	59.11 (1.23)
Cost B	4778.44 (91.67)	4421.52 (92.09)	4509.98 (94.08)
Imputed family labour wages	434.46 (8.33)	379.65 (7.91)	283.71 (5.82)
Cost C	5212.90 (100.00)	4801.17 (100.00)	4793.69 (100.00)

Figures in parenthesis are percentages to total

TV = Traditional variety

Table 6.9. Operationwise cost of cultivation of TV paddy per hectare in different seasons (Figures in Rs)

Particulars	Viruppu	Mundakan	Puncha
Preparatory cultivation	803.34 (15.41)	561.63 (11.70)	485.18 (10.12)
Seeds and sowing	802.47 (15.39)	457.87 (9.54)	277.32 (5.79)
Weeding	305.32 (5.86)	320.82 (6.68)	293.29 (6.12)
Plant protection	62.62 (1.20)	56.87 (1.18)	39.07 (0.82)
Manures and application	401.25 (7.70)	443.60 (9.24)	371.61 (7.75)
Fertilizers and application	463.26 (8.89)	419.64 (8.74)	483.70 (10.09)
Irrigation and drainage	271.24 (5.20)	270.16 (5.63)	313.19 (6.53)
Harvesting etc.	629.26 (12.07)	674.78 (14.05)	805.20 (16.80)
Miscellaneous	42.99 (0.82)	49.65 (1.03)	49.62 (1.04)
Depreciation on implements	101.72 (1.95)	101.72 (2.12)	101.72 (2.12)
Interest on working capital	137.96 (2.65)	119.08 (2.48)	117.45 (2.45)
Less family wages	434.46	379.65	283.71
Cost A	3586.97 (68.81)	3096.15 (64.49)	3053.59 (63.70)
Rental value of own land	1132.36 (21.72)	1266.26 (26.37)	1397.28 (29.15)
Interest on fixed capital	59.11 (1.13)	59.11 (1.23)	59.11 (1.23)
Cost B	4778.44 (91.67)	4421.52 (92.09)	4509.98 (94.08)
Imputed family labour wages	434.46 (8.33)	379.65 (7.91)	283.71 (5.92)
Cost C	5212.90 (100.00)	4801.17 (100.00)	4793.69 (100.00)

Figures in parenthesis are percentages to total

for puncha. What appears to be actually happening was perhaps of more family labour under conditions of labour scarcity (which may be the use during viruppu and mundakan) and use of less of it under conditions of later in abundance (which may be the case in puncha).

Of different operations, the proportion of expenditure on preparatory cultivation showed a substantial decline from viruppu to puncha due to shift from bullock labour to tractor power for ploughing and also due to reduction in the number of ploughings. Cost on seeds and sowing also decreased. As explained in thecase of HYV this was due to the change in the method of sowing. The expenditure on irrigation and drainage was almost the same during viruppu and mundakan but it was slightly higher during puncha. Expenditure on harvesting increased from viruppu to mundakan and then to puncha.

The total cost per hectare without rental value of land in viruppu was Rs.4080.54, Rs.3534.91 in mundakan and Rs.3396.41 in puncha.

Yield and returns

Per hectare yield, gross income and income at different costs, benefit cost ratio at different costs and cost per quintal of paddy grain production are given in Table 6.10.

It can be seen that the grain production increased from viruppu to mundakan and then to puncha. Gross returns increased from viruppu (Rs.5411.79) to mundakan (Rs.5681.30) and then to puncha (Rs.6186.36).

Table 6.10. Per hectare yield and measurement of income at different costs of TV paddy in different seasons

Particulars	Viruppu	Mundakan	Puncha
Quantity of grain (kg)	2619.64	2718.65	2780.25
Quantity of byproduct (bundles)	1690.00	1753.75	1700.00
Value of grain (Rs)	3721.79	3927.55	4486.38
Value of byproduct (Rs)	1690.00	1753.75	1700.00
Gross value (Rs)	5411.79	5681.30	6186.38
Farm business income (Rs)	1824.82	2585.15	3132.79
Family labour income (Rs)	633.35	1259.78	1676.40
Net income (Rs)	198.89	880.13	1392.69
Income at cost C excluding rental value of land (Rs)	1331.25	2146.39	2789.97
Benefit cost ratio at cost A	1.509	1.835	2.026
cost B	1.133	1.285	1.372
cost C	1.038	1.183	1.291
Cost C excluding rental value of land	1.326	1.607	1.821
Cost/quintal of grain at Cost C (Rs)	134.48	112.09	111.27
Cost/quintal of grain at Cost C excluding rental value of land (Rs)	91.25	65.52	61.02

Farm business income, family labour income and net farm income were highest in puncha season and lowest in Viruppu. Benefit cost ratio was also highest in the puncha season. It was 2.026 at cost A, 1.372 at cost B and 1.291 at cost C. Cost per quintal of paddy production at cost C was lowest in the puncha season (Rs.111.27) and highest in viruppu season (Rs.134.48). Cost per quintal of paddy at total cost excluding rental value of land was as low as Rs.61.02 in puncha and it was Rs.91.25 in viruppu season.

As mentioned earlier, eventhough there was very little difference in the cost incurred on different inputs among 3 seasons, the change in gross returns and returns varied widely because of change in the yield of grain and straw, as also quality of grain, which are influenced by climatic conditions prevailing in the three seasons.

Resource use efficiency in paddy

Resource use efficiency in paddy cultivation was estimated for viruppu paddy and mundakan paddy separately. Straight line function was used. R^2 was significant in both the cases but none of the regression coefficients was significant.

The function for viruppu paddy was

$$Y = 11.150 + 0.002\ x_1 + 3.589\ x_2 + 8.788\ x_3 + 0.276\ x_4 + 1.677\ x_5 + 0.0003\ x_6 - 0.434\ x_7 + 0.119\ x_8 - 0.266\ x_9 - 0.044\ x_{10}$$

$$\bar{R}^2 = 0.379$$

$$R = 0.6162$$

For mundakan paddy

$$Y = 10.888 + 0.0039\ x_1 + 4.49\ x_2 + 7.8046\ x_3$$
$$-3.710\ x_4 + 2.443\ x_5 + 0.00019\ x_6 - 0.689\ x_7 + 0.230\ x_8$$
$$-0.130\ x_9 + 0.0676\ x_{10}$$

$$R^2 = 0.2864$$
$$R = 0.5735$$

where

Y = Grain yield in kilograms
x_1 = Area in cents
x_2 = Nitrogen in kilograms
x_3 = Phosphorus in kilograms
x_4 = Potassium in kilograms
x_5 = Expenditure on plant protection
x_6 = Total gross income of the farm household
x_7 = Expenditure on bullock labour and tractor (Rs)
x_8 = Male labour hours
x_9 = Female labour hours
x_{10} = Expenditure on farm yard manure (Rs)

The reason for nonsignificant coefficients may be due to multicolleniarity and also autocorrelation.

Annual crops (Banana)

The main annual commercial crop grown in the study area is banana. It is cultivated either as a monoculture or as intercrop in the coconut and arecanut gardens. On the sample farms Nendran variety was common. If it is a monoculture, a

spacing of 2 m x 2 m is provided i.e., 2500 plants per hectare. Selected suckers are used for planting. After smearing with cowdung solution, and ash, they are dried in the sun for 3-4 days and stored in shade upto 15 days before planting.

Preparation of land: Field is prepared by digging pits. The size of pits depends upon soil, water table etc. The normal size of pits observed was 50 x 50 x 50 cm. For digging pits generally hired labour was engaged and payment was Rs.0.50 to Rs.0.90 per pit on the sample farms. Planting is between May-August.

Weeding: Weeds were removed manually 3 or 4 times during entire crop period. Use of weedicides was not found on the sample farms.

Manures and fertilizers: Use of green manures and farm yard manure was common for banana on the sample farms. Chemical fertilizers were also used but well below the recommended levels. The nitrogen, phosphorus and potassium nutrients application to banana in different holding size groups and income groups are given in Table 43 of Appendix II. The figures are in grams per plant. It can be seen that the average nitrogen applied per plant was only 64.54 g as against the recommended level of 190 g per plant. In the case of phosphorus as well as potassium also the applied dosages were

far less than the recommended levels. The actual quantities applied were in split dozes in August and November.

Among holding size groups, highest nitrogen/plant (71.50 gm) was applied in medium holding size and lowest in the smallest holding size group (56.63 gm). Phosphorus application was higher in the large holding size group (40.99 gm) whereas potassium application was higher in the medium holding size group (55.81 gm).

Among income groups, the application of nitrogen, phosphorus and potassium was highest in the middle income group where the applied quantities were 70.07 gm, 37.02 gm and 51.3 gm per plant respectively.

Irrigation: Banana crop is irrigated during summer. Beginning from December to April-May irrigation is provided for banana. For irrigation pumpsets are used or water is purchased from pumpset owners on hourly basis. During rainy season drainage is provided on all farms. For irrigation and drainage use of family labour was common even on the large farms and also in higher income groups.

Plant protection: Seed treatment with chemicals like BHC and Aldrin was observed on the sample farms. Bordeaux mixture and other pesticide spraying was also observed.

Supporting: After the emergence of inflorescence and start of fruit setting banana plants were given support with

bamboo sticks so as to enable them to withstand the weight of the bunch.

Harvesting: Harvesting was mainly carried out by family labour. As all bunches may not come to maturity at same time it would be too uneconomic to engage casual labour for harvesting.

Banana cultivation is highly labour intensive. The labour utilization in different holding size groups and income groups was calculated and is presented in the Table 44 of Appendix II. The average male labour hours utilized were 2161.71/ha and that of female labour 518.64 hours/ha. The average family male labour hours utilized were 943.93 and that of female labour 336.77 hours. Hired male labour hours utilized were 1217.78 and female labour hours 181.87.

Among different holding size grouos, the family labour utilization decreased with increase in the holding size both in the case of male and female labour hours from 1515 hours of male labour and 625.20 hours of female labour in the smallest holding size group to 502 hours of male labour and 128.4 hours of female labour in large sized holdings.

Among different income groups also the participation of family labour (male and female) decreased with inorease in income. The utilization of hired labour (both men and women) increased with increase in income. Even though banana cultivation is highly labour intensive, farmers prefer to cultivate

banana because of high profitability.

Cost of cultivation

Data on cost of cultivation of banana is presented according to holding size groups in Table 45 and Table 46 of Appendix II. Table 45 shows inputwise cost per hectare and Table 46 shows the same operationwise. The average total cost of cultivation (cost C) on sample farms worked out to Rs.34554.95/ha. Of it cost A and cost B constituted 64.22 per cent and 91.58 per cent respectively. The important inputs of expenditure were bamboos for support Rs.7955.56 (23.02%) followed by hired human labour, manures, seed material (suckers) and fertilizers constituting Rs.3272.13 (9.47%), Rs.2978 (8.47%), Rs.2729.19 (7.90%) and Rs.1815.44 (5.25%) respectively. Pesticides, irrigation, (Pumpset and irrigation cess), miscellaneous expenses, depreciation and interest on working capital, etc. constituted 0.6 per cent, 1.4 per cent, 0.93 per cent, 0.29 per cent and 6.88 per cent respectively. Imputed rental value of land constituted as much as 27.19 per cent (Rs.9396.49) of the total cost and imputed cost of family labour accounted 8.42 per cent of the total cost.

Among holding size groups the proportion of expenditure on hired labour increased with increase in the holding size. The cost incurred on suckers was almost same in all the holding size groups. The proportion of expenditure on manures decreased

with increase in holding size. It varied from 10.05 per cent of the total cost in the smallest holding group to 7.02 per cent in the large holding size group. In absolute terms also expenditure on manures decreased constantly with increase in size.

Fertilizer cost, both absolutely as well as, as a proportion of total cost increased with size except in the large holding size group. Pesticides constituted less than one per cent of total cost in all holding size groups. The proportion of expenditure on bamboo support varied between 21.48 per cent of the total cost in the small holding size group to 24.78 per cent of the total cost in the large holding size group. The expenditure on irrigation constituted 0.87 per cent of the total cost in the large holding size group and 1.89 per cent in the smallest holding size group. Family labour constituted as much as 13.02 per cent of the total cost on smallest farms and it decreased to 4.42 per cent on the large farms. Total cost decreased with the holding size except on medium sized farms.

Among different operations, the average expenditure on supporting was highest constituting 23.83 per cent (Rs.8233.94) of the total cost. Planting, irrigation and making pits constituted 9.45 per cent (Rs.3263.75), 4.68 per cent (Rs.1616.44) and 4.49 per cent (Rs.1552.25) respectively. Among different holding size groups expenditure on pits increased with size

both absolutely as well as relatively. Expenditure on planting and weeding did not show any pattern, though the inter size differences were not high. The proportion of expenditure on irrigation constituted only 3 per cent (Rs.1024.25) of the total cost in the large holding size group and 7.10 per cent (Rs.2471.25) in the smallest holding size group. Expenditure on irrigation decreased consistently with increase in size of holding. There seems to be some scale economy in irrigation.

The figures of cost of cultivation according to income groups are given in Tables 47 and 48 of Appendix II where Table 47 shows details inputwise and Table 48 shows details operationwise. Among income groups proportion of expenditure on hired labour increased with increase in income, except in the middle income group where it decreased marginally. But in real terms, there was a marginal increase. The proportion of expenditure on suckers varied very little among income groups. The proportion of expenditure on manures decreased with increase in income. At the same time expenditure on fertilizers increased ~~increased~~ with increase in income except in the middle income group where it decreased marginally. Expenditure on pesticides did not cross one per cent of the total cost in any income group.

Expenditure on pumpset and water cess constituted 1.94 per cent (Rs.684.50) of the total cost in the lowest income

group whereas it constituted only 0.97 per cent (Rs.328.25) in the highest income group. The proportion of imputed wages of family labour showed a decrease with increase in income. It constituted 13.05 per cent of the total cost in the lowest income group and only 2.76 per cent in the highest income group.

Of different operations, inter-class difference in expenditure on pits, planting and weeding was almost absent. The proportion of expenditure on irrigation varied between 2.55 per cent of the total cost in the highest income group to 6.92 per cent of the total cost in the lowest income group. The proportion of expenditure on harvesting was around one per cent of the total cost in all income groups. The total cost was highest in the lowest income group and lowest in the lower income group.

Yield and Returns

The yield per hectare, gross returns, income at different costs, benefit cost ratio, and cost/bunch and cost/kg of banana are given in Table 49 and Table 50 of Appendix II. While Table 49 shows the details of holding size groups, Table 50 shows the same income groupwise.

The average yield on sample farms was 16316.50 kg/ha. Gross returns were Rs.46982.44/ha. Average farm business income, family labour income and net farm income were

Rs.24791.90, Rs.15336.30 and Rs.12427.49 respectively. Net income at total cost excluding rental value of land was Rs.21823.99/ha. Benefit cost ratio at cost A was 2.117, at cost B 1.485, at cost C 1.360 and at total cost excluding rental value 1.867. The cost per bunch was Rs.13.82 and cost per kg was Rs.2.12 at cost C whereas at total cost excluding rental value of land, cost per bunch was Rs.10.06 and cost per kg was Rs.1.54.

The highest yield of 16950 kg/ha was obtained in medium holding size group and gross returns per hectare in that holding group was Rs.51347.75. Benefit cost ratio was also highest in the medium holding group, which at cost A was 2.32 at cost B 1.583 and at cost C 1.483. But cost per bunch at cost C was lower in the large holding size (Rs.13.67), whereas cost per kg was lowest in the medium holding size group (Rs.2.04). At total cost excluding rental value cost/bunch and cost/kg were lowest in the medium holding size group which were Rs.9.75 and Rs.1.44 respectively.

Among income groups yield per hectare was highest in the high income group. The per hectare yield in this group was 16654 kg and gross returns were Rs.49384.00. Benefit cost ratio was also highest in the high income group at all costs. They were 2.143, 1.497, 1.456 and 2.054 at cost A, B, C and at total cost excluding rental value of land respectively.

Cost per bunch and cost per kg of banana at cost C as well as at total cost excluding rental value were lowest in the high income group. The price received per bunch varied from Rs.17 to Rs.26 based on the weight of the bunch at farm level.

Perennial crops

The important perennial crops grown in the study area are coconut and arecanut. The practices followed for this are described here and the maintenance cost and the returns from the crops are also discussed.

COCONUT

Manuring

Use of farm yard manures and green manures for coconut was common. Chemical fertilizers were also found to be used, on the sample farms, but it was far below the recommended levels. The relevant figures are given in the Tables 51A and 51B of Appendix II for holding size groups and income groups. The average nitrogen applied per palm was 77.56 gm as against the recommended level of 500 gm per palm. In the case of phosphorus and potassium, the average dose applied per palm was 63.11 gm and 82.80 gm respectively which were well below the recommended levels. This low level of fertilizer use on the average was due to the fact that on a number of farms chemical fertilizers were not used.

Among holding size groups, highest nitrogen per palm (105.68 gm) and highest potassium per palm (131.11 gm) were

used in the medium size group. But phosphorus application was highest (184.67 gm/palm) in the large size group. Among income groups nitrogen and phosphorus applied were highest in the high income group (94.02 gm/palm) and (86.38 gm/palm). But potassium application was highest in the lower income group (131.80 gm/palm). But in all size groups and income groups the application was far below the recommended level.

Plant protection

Very little care was shown in the case of coconut palms regarding control of pests and diseases, in this region. Only on few sample farms spraying of bordeaux mixture was found.

Weeding

Weeding was done 3 or 4 times in a year by human labour and mostly family labour.

Irrigation

Coconut palms were irrigated during summer, once in a week with either pumpsets or human labour. Even purchase of water from pumpset owners by non-owners was quite common.

Harvesting

Coconut is harvested at a regular interval of 30-35 days for about 6 months from July-August to December-January. The number of harvests varied from 5 to 7. Hired male labour is employed for harvesting. The payment varied between 50 paise

per palm to Rs.1 per palm per harvest with 2 or 3 nuts for one harvest in a garden.

Labour utilization for maintenance of coconut garden per hectare has been calculated and presented in Table 52 of Appendix II. The average labour utilization was 488.72 hours counting of 418.96 hours of male labour and 69.76 hours of female labour/ha. Among holding size group both family male and female labour use decreased with increase in the holding size, except in the small holding size group where family female labour increased over smallest holding size group's figure. Hired labour both male and female increased with increase in holding size except in the medium holding size group where female labour showed a decrease over small holding size group's figure. Among income groups, family labour utilization decreased with increase in income and hired labour increased with increase in income.

Cost of cultivation

In the present study it was not possible to study the cost of cultivation in its entirety for want of time, and only maintenance cost per year was studied.

The relevant figures regarding maintenance costs per hectare of different holding size groups is given in Tables 53 and 54 of Appendix II. While Table 53 shows details inputwise Table 54 shows the same operationwise. The average total cost (cost C) was Rs.5184.86/ha. Costs A and B constituted

49.04 per cent and 92.43 per cent respectively of cost C. The average imputed cost of family labour was 7.57 per cent of the total cost. Imputed rental value of land per hectare worked out to Rs.2190.63 (42.25%) of the total cost which was almost near to cost A. Among different inputs human labour, manures and irrigation were the main constituents of total cost with 14.89 per cent, 11.81 per cent and 9.68 per cent, respectively. Fertilizers, pesticides, miscellaneous items, depreciation and interest on working capital constituted 4.55 per cent, 0.28 per cent, 0.61 per cent, 1.96 per cent and 5.25 per cent of the total cost (cost C) respectively.

Among size groups, the cost incurred on hired labour increased with increase in the size of holding. It was 10.76 per cent (Rs.548.53) of the total cost in the smallest holding group increased to 18.95 per cent (Rs.872.00) in the large holding group. Expenditure on manures was higher in the smallest holding size group constituting 13.25 per cent of the total cost (Rs.675.20), but expenditure on fertilizers was lowest 1.77 per cent (Rs.90.40). In medium holding size group expenditure on manures was lowest and expenditure on fertilizers was higher than in other groups. The expenditure on pesticides in all holding size groups was marginal and less than 0.51 per cent of the total cost. Expenditure on pumpset irrigation was higher in small holding size group constituting 11.98 per cent (Rs.665.80) of the total cost followed by the

smallest holding size group constituting 10.29 per cent (Rs.524.60). Cost A was more than half of the total cost only in the small holding size group and large holding size group and total cost was highest in small holding size group followed by medium holding size group with Rs.5558.27 and Rs.5482.29 respectively. The total cost was the lowest in large holding size group (Rs.4601.62). The proportion of rental value was as much as 45.03 per cent of the total cost in larger holding size group and 39.45 per cent in the small holding size group. Family labour constituted 11.62 per cent in the smallest holding size group and only 2.93 per cent in the large holding size group.

Among different operations, cost on irrigation was 14.63 per cent of the total cost (Rs.758.65) followed by manures and application and harvesting constituting 13.96 per cent (Rs.724.05) and 11.89 per cent of the total cost (Rs.616.63) respectively. The proportion spent on weeding and plant protection constituted 2.36 per cent and 0.52 per cent respectively. Among different holding size groups the cost on irrigation was highest in small holding size group constituting 16.57 per cent (Rs.920.93) of the total cost. But in the large holding size group irrigation constituted only 8.89 per cent (Rs.487.00) of the total cost.

Harvesting cost was highest in the smallest holding size group constituting 13.04 per cent (Rs.664.60) of the

total cost. This depends on the proportion of bearing palms to total palms in each holding size group and the payment was per palm.

The cost of maintenance of one hectare of coconut garden according to income groups is given in Tables 55 and 56 of Appendix II. While Table 55 gives details inputwise Table 56 shows the same operationwise.

Among different income groups, the cost on hired labour increased with increase in income. The proportion of cost on hired human labour was 8.62 per cent in the lowest income group and highest in the high income group accounting 20.13 per cent of the total cost. The proportion of expenditure on manures was highest in middle income group farms (13.94%) and lowest in the high income group farms (9.98%). The proportion spent on pesticides did not constitute even half per cent of the total cost in any income group. The proportion of expenditure on pumpset use was highest in lowest income group farms (11.28%) and lowest in the high income group farms (7.65%). Miscellaneous items did not constitute more than one per cent to total cost in any income group. Cost A was less than half of the total cost in all income groups except in the high income group (53.46%). Rental value of land constituted more than 40 per cent of the total cost in all income groups. Family labour constituted 13.47 per cent

of the total cost in the lowest income group but only 2.73 per cent of the total cost in the high income group.

Among different income groups, the proportion of expenditure on weeding was lowest in the lowest income group (1.95%) and highest in the high income group (3.29%). Irrigation constituted as much as 16.34 per cent (Rs.936.40) of the total cost in the lower income group and 12.82 per cent (Rs.583.06) in the high income group. Harvesting charges were highest in the lowest income group (12.75%) and lowest in the high income group (11.08%). Total cost in different income groups was Rs.4785.20/ha in the lowest income group, Rs.5730.22/ha, Rs.5674.81/ha and Rs.4549.22/ha in the low, middle and high income groups, respectively. The peculiarity of cost structure of coconut is that excluding the rental value of land from total cost, the net returns from one hectare of coconut garden will be very high. At cost C the maintenance cost per palm on the sample farms was Rs.25.92.

Yield and returns

Per hectare yield, gross income and net income per hectare and cost per 100 nuts in different holding groups are presented in Tables 57 and 58 of Appendix II.

The average production of nuts per hectare of coconut garden on sample farms was 7670. The average gross returns per hectare were Rs.10953.15. The farm business income family labour income and net farm income were Rs.8410.43, Rs.6160.69 and Rs.5768.29 respectively and at total cost excluding imputed

rental value of land the net income was Rs.7958.92. The cost for maintenance of one palm was Rs.12.71 at cost A, Rs.23.96 at cost B, Rs.25.92 at cost C and Rs.14.97 at total cost excluding rental value of land. Cost per 100 nuts was Rs.14.28, Rs.43.61, Rs.48.73 and Rs.20.17 at cost A, cost B, cost C and at total cost excluding rental value respectively. The average yield of nuts per palm (bearing palms) was 53, which though higher than the state average was much below the levels found in well managed gardens.

Among holding size groups, yield per hectare was highest (8316 nuts/ha) in the smallest holding size, mainly because of more number of palms in bearing per hectare. But gross returns were highest in the medium holding size group (Rs.11589.40). The maintenance cost per palm including harvesting at cost A was lowest in the smallest holding size group (Rs.11.26), at cost B in large holding size group (Rs.22.33), at cost C as well as at total cost excluding rental value in the large holding size group Rs.23.01 and Rs.12.65 respectively. Cost per 100 nuts was lowest in the smallest holding size groups mainly because more palms were yielding. The cost per 100 nuts at cost A, B and C was Rs.11.02, Rs.38.11 and Rs.45.23 respectively. Yield per bearing palm was highest in the large holding size group (66/palm).

Among income groups the yield of nuts per hectare as well as returns was highest in the middle income group.

Maintenance cost per palm was lowest in the lowest income group at cost A and cost B. But at cost C and also at total cost excluding rental value it was lowest in the high income group.

Cost per 100 nuts was lowest in the lowest income group Rs.9.27 at cost A, Rs.36.75 at cost B, Rs.45.33 at cost C and Rs.18.61 at total cost excluding rental value. The average yield per bearing palm was highest in the middle income group which had the yield of 60 nuts per bearing palm.

The price realised per 100 nuts at the farm level varied between Rs.115.00 to Rs.135.00 depending on the size of nuts. The cost per 100 nuts at cost C was only Rs.48.73, which shows high profitability of coconut.

The benefit cost ratio was highest in the lowest income group at cost A and Cost B. The figures were 4.838 at cost A and 2.425 at cost B. But at cost C it was highest in the middle income group (2.187).

ARECANUT

Another important perennial crop grown in the region is arecanut. Though it is grown mainly as an intercrop in coconut gardens in some cases it is also grown as a major crop in multiple cropping.

Manuring and fertilizers

Green manuring and use of farm yard manure was common

on sample farms. Chemical fertilizers were also used but to a limited extent. The use of N, P and K per palm are given according to holding size groups and income groups in Tables 51A and 51B of Appendix II.

The average nitrogen applied per palm was 30.50 gm as against the recommended level of 100 gm/palm. Application of phosphorus and potassium was also far lower than the recommended levels.

Among holding size groups, highest nitrogen, phosphorus, potassium were applied in the medium holding size group at the rate of 54.13 gm/palm, 34.33 gm/palm and 47.55 gm/palm respectively.

Among income groups highest nutrients were applied in th lowest income groups with 50.70 gm/palm of nitrogen, 34.56 gm/palm of phosphorus and 48.57 gm/palm of potassium.

Plant protection

Plant protection and use of plant protection chemicals was generally done by the contractors who purchase the product on price fixed prior to harvest. The contractors deduct the amount they spent on plant protection from the predetermined amount they are required to pay for the produce. Generally bordeaux mixture spraying was found on sample farms.

Harvesting

Harvesting is done by contractors who purchase the

product before harvest. Contractors fix the prices before harvest and purchases the product on the tree itself. Harvesting was done by them only by employing their labourers.

Irrigation

Palms were irrigated once in 4-7 days on the sample farms with pumpset or human labour. Purchasing water from pumpset owners by non-owners was also common.

Labour utilization

The average utilization of labour per hectare of arecanut plantation is worked out and presented in Table 52 of Appendix II, both for holding size groups and income groups. It can be seen that average total male labour hours utilized were 719.74/ha and that of female labour hours 26.47. Family male labour contributed 384.59 hours/ha on an average and hired male labour 335.15 hours. Family female labour contributed 133.6 hours and hired female labour 92.87 hours/ha. Except in the medium holding size group where family female labour showed an increase in all other groups both male and female labour of family showed a decrease with increase in holding size group.

Among income groups both male and female labour contributed by family members decreased with increase in income.

Cost of maintenance

The cost of maintenance of one hectare of arecanut plantation is presented according to holding size groups in

Tables 59 and 60 of Appendix II. While Table 59 shows inputwise cost Table 60 shows the same operationwise. The average total cost (cost C) on sample farms was Rs.11594.66/ha. Cost A and B constitutes 53.65 per cent and 85.77 per cent respectively of cost C. The important inputs of expenditure were human labour and manures constituting 24 per cent and 23.62 per cent respectively of the total cost, followed by interest on working capital, fertilizers and pumpset constituted 5.75 per cent, 5.71 per cent and 3.83 per cent respectively. Pesticides, miscellaneous items and depreciation on implements constituted 1.96 per cent, 2.14 per cent and 0.88 per cent respectively. Imputed rental value of land constituted as much as 31.61 per cent of the total cost and family labour 14.22 per cent of the total cost.

Among holding size groups the proportion of expenditure on hired labour increased with increase in the holding size except in the medium size group. But total expenditure on hired labour increased with size. Proportion of expenditure on pesticides was lowest (0.96%) in the smallest holding size group and highest (2.96%) in the large size group. The proportion of expenditure on manures in the large holding size group was 22.23 per cent (Rs.2323.75) of the total cost and 24.33 per cent (Rs.3071.75) in the smallest holding size group. But fertilizers constituted only 3.71 per cent of the total cost (Rs.468.81) in the smallest holding size group and

highest (2.96%) in the large size group. The proportion of expenditure on manures in the large holding size group was 22.23 per cent (Rs.2323.75) of the total cost and 24.33 per cent (Rs.3071.75) in the smallest holding size group. But fertilizers constituted only 3.71 per cent of the total cost (Rs.468.81) in the smallest holding size group and 7.56 per cent of the total cost (Rs.918.50) in the medium size holdings. Pumpset irrigation accounted for as much as 5.41 per cent of the total cost (Rs.603.62) in the small holding size group but only 2.64 per cent (Rs.276.37) in the large holding size group. Cost A constituted only 45.21 per cent of the total cost (Rs.5708.33) in the smallest holding size group and 59.62 per cent (Rs.6232.98) in the large holding size group. Rental value of land accounted for 29.15 per cent of the total cost (Rs.3680.32) in the smallest holding size group and 33.97 per cent (Rs.3551.62) in the large holding size group. Family labour showed a declining trend with increase in holding size.

Among different operations, the average expenditure on weeding per hectare was Rs.766.56 constituting 6.61 per cent of the total cost. Expenditure on plant protection was Rs.560.56 (4.83%), on manuring Rs.3321.53 (28.65%), on fertilizers and application Rs.818.63 (7.06%) and on irrigation Rs.1386.75 (11.96%).

Among holding size groups, proportion of expenditure on weeding was highest in the small holding size group and lowest in the medium holding size group. The expenditure on plant protection increased with increase in the holding size from Rs.347.87 in the smallest holding to Rs.814.00 in the large holding size group. The proportion of expenditure on manures did not show much variation. The proportion of expenditure on irrigation constituted as much as 19.93 per cent of the total cost in the smallest holding size group and only 6.62 per cent in the highest income group.

The figures of maintenance cost per hectare according to income groups are given in Tables 61 and 62. While Table 61 shows the details as inputwise, Table 62 shows the same operationwise.

Among income groups, the proportion of expenditure on hired human labour increased with raise in income. It was only 5.09 per cent of the total cost in the lowest income group and it was 13.98 per cent of the total cost in the high income group. The proportion of expenditure on manures increased with increase in the income except in the high income group. Expenditure on pumpset irrigation constituted only 2.23 per cent of the total cost on the high income group farms and 4.94 per cent in the lowest income group farms. Cost A was lowest in the lowest income group constituting only 48.32 per cent of the total cost and it did not show any pattern. Proportion of imputed cost of family

labour decreased with increase in income except in the middle income group, but in absolute terms it decreased.

Among income groups the proportion spent on weeding did not show any pattern.

The total cost in the lowest income group was Rs.12069.02 per hectare and Rs.12230.36, Rs.10932.85 and Rs.11146.32 in the lower, middle and high income groups respectively.

Yield and returns

Yield, gross returns, net income at different costs per hectare of arecanut plantation and cost per one kilogram of dry nuts at different costs are given in Tables 63 and 64 of Appendix II. While Table 63 shows according to holding size groups, Table 64 shows according to income groups. The average yield per hectare was 1447.48 kg and gross returns were Rs.18323.59. The net income at total cost excluding rental value of land was as high as Rs.10393.65/ha. The cost per one kilogram of dry nuts was Rs.4.30 at cost A, Rs.6.87 at cost B, Rs.8.01 at cost C and Rs.5.48 at total cost excluding rental value of land. The average benefit cost ratio on sample farms was 2.945 at cost A, 1.843 at cost B, 1.580 at cost C and 2.311 at total cost excluding rental value of land. Price received per one kilogram of dry nuts varied between Rs.12 to Rs.14.75.

Among holding size groups, yield/hectare was highest in the medium holding size group. Among holding size groups, the cost per one kg of dry nuts was lowest in the smallest holding size group at costs A and B whereas at cost C and at total cost excluding rental value of land it was the highest in the large holding size group. The benefit cost ratio was highest in the smallest holding group at cost A (3.224) and cost B (1.945). But at cost C it was more in the large holding group (1.699).

Among income groups, yield per hectare was highest in the high income group. The cost per one kg of dry nuts at all costs, was lowest in the high income group. The benefit cost ratio was highest in the middle income group at costs A and B, but at cost C it was marginally higher in the high income group. In spite of high maintenance costs and labour intensive nature of these plantation crops they are preferred over paddy because of high returns. Other crops like pepper, cashew, rubber, etc. are grown in the region but they were quite unimportant in the sample farms.

DAIRY ENTERPRISE

Milch animals play an important role in rural economy by helping in augmenting the income of farmers. Now-a-days the dairy business is considered as a profitable enterprise and hence the attention of small farmers is attracted towards

this business. But high cost of dry fodder in the study area is inhibiting the farmers to take up this enterprise. On sample farms on an average, not even one milch animal was present per farm. The data regarding the maintenance cost, returns and current income from the milch animal with the farmers have been presented according to holding size groups in Table 6.11 and according to income groups in Table 6.12.

It can be seen that on sample farms, the per farm cost of maintenance of milch animals was Rs.1345.35 of which 52.29 per cent, 5.40 per cent and 28.69 per cent were on dry fodder, green fodder and concentrates respectively. Veterinary charges were Rs.18.28 per farm and constituted 1.36 per cent of the total working cost and upkeep charges were 12.26 per cent.

Among holding size groups, the working cost per farm increased with holding size because of increase in number of milch animals per farm. The proportion of expenditure on dry fodder was more than half of the total working cost in all holding size groups except in the small holding size where it constituted 49.67 per cent. The expenditure on green fodder was 7.16 per cent in the smallest holding size group and it decreased to 4.22 per cent in the large holding size group. The expenditure on concentrates was almost same in all holding size groups. This expenditure varied in each group according

Table 6.11. Per farm maintenance cost and current income from milch animals in holding size groups

Holding size group	Dry fodder		Green fodder		Concentrates	Veterinary charges	Upkeep charges	Total working cost	Gross income	Current income
	Quantity (Qt)	Price (Rs)	Quantity (kg)	Price (Rs)	(Rs)	(Rs)	(Rs)	(Rs)	(Rs)	(Rs)
Smallest	3.80	377.08 (51.23)	184.35	52.67 (7.16)	210.40 (28.58)	9.94 (1.35)	86.03 (11.69)	736.12 (100.00)	1070.31	334.19
Small	5.00	504.35 (49.67)	230.25	64.86 (6.39)	304.45 (29.98)	14.00 (1.38)	127.83 (12.59)	1015.49 (100.00)	1584.40	568.91
Medium	10.00	1016.73 (52.48)	336.00	96.00 (4.96)	559.14 (28.86)	32.30 (1.67)	233.08 (12.03)	1937.25 (100.00)	2848.87	911.62
Large	12.00	1204.20 (54.29)	320.74	93.64 (4.22)	617.25 (27.83)	24.00 (1.08)	278.95 (12.58)	2218.04 (100.00)	3187.33	969.29
Overall	6.99	703.52 (52.29)	253.89	72.69 (5.40)	385.97 (28.69)	18.28 (1.36)	164.89 (12.26)	1345.35 (100.00)	1983.08	637.73

Figures in parenthesis are percentages to total

Table 6.12. Per farm maintenance cost and current income from milch animals in income groups

Income groups	Dry fodder		Green fodder		Concentrates	Veterinary charges	Upkeep charges	Total working cost	Gross income	Current income
	Quantity (Qt)	Price (Rs)	Quantity (kg)	Price (Rs)	(Rs)	(Rs)	(Rs)	(Rs)	(Rs)	(Rs)
Lowest	2.80	278.29 (47.66)	136.48	39.04 (6.69)	194.84 (33.37)	7.06 (1.21)	64.71 (11.08)	583.94 (100.00)	919.06	335.12
Lower	7.20	731.05 (50.62)	323.68	92.48 (6.40)	405.80 (28.10)	22.24 (1.54)	192.57 (13.33)	1444.14 (100.00)	1906.79	462.65
Middle	8.40	847.17 (52.53)	254.47	73.50 (4.56)	494.32 (30.65)	17.83 (1.11)	179.83 (11.15)	1612.65 (100.00)	2383.65	771.00
High	14.84	1484.67 (56.86)	368.80	105.37 (4.04)	662.70 (25.38)	36.50 (1.40)	321.76 (12.32)	2611.00 (100.00)	4237.46	1626.46
Overall	6.99	703.52 (52.29)	253.89	72.69 (5.40)	385.97 (28.69)	18.28 (1.36)	164.89 (12.26)	1345.35 (100.00)	1983.08	637.73

Figures in parenthesis are percentages to total

to stage of lactation period and status of the animal. This also may be due to difference in proportionate distribution of animals in milk and dry animals in different holding size groups. The expenditure on concentrates in the smallest holding size group was Rs.210.40, and in small, medium and large holding size groups Rs.304.45, Rs.559.14 and Rs.617.25 per farm respectively. Veterinary charges were Rs.9.94 in the smallest holding size group, Rs.14.00 in the small holding size group, Rs.32.30 in the medium holding size group and Rs.24.00 in the large holding size group. Labour charges (both family and hired) were around 12 per cent in holding size groups.

Among income groups, the expenditure on dry fodder constituted more than half of the working cost in all income groups except in the lowest income group, where it was only 47.66 per cent. The proportion of expenditure on green fodder decreased with increase in income from 6.69 per cent of the total cost in the lowest income group to 4.04 per cent in the high income group. The expenditure on concentrates was highest in the lowest income group which constituted 33.37 per cent of the total working cost. This was due to more number of animals in milking stage. Concentrates constituted only 25.38 per cent of the total cost in the high income group. But the absolute costs increased from Rs.194.04 per farm in the lowest income group to Rs.662.70 per farm in the high income group.

Veterinary charges constituted 1.54 per cent of the total cost in the lower income group, 1.40 per cent in the high income group, 1.21 per cent in the lowest income group and 1.11 per cent in the middle income group. Upkeep charges, increased with increase in income except in the middle income group. Total cost per farm was Rs.583.94 in the lowest income group followed by Rs.1444.14, Rs.1612.65 and Rs.2611.00 per farm in the low, middle and high income groups respectively.

Returns

The average gross income was Rs.1983.08 and net current income was Rs.637.73 per farm. Among holding size groups current income was Rs.334.19 per farm in the smallest holding size group and Rs.969.29 per farm in the large holding size group.

Among income groups, current income was Rs.335.12 in the lowest income group, Rs.462.65 per farm in the low income group Rs.771.00 per farm in the middle income group and Rs.1626.46 per farm in the high income group. As most of the milch animals on sample farms were cross breeds, the current returns were remunerative.

The foregoing analysis of farm business in Ollukkara Block indicates that paddy was the most important crop grown in the region. The cost of cultivation of paddy decreased

from viruppu to puncha. The cost incurred on different capital inputs showed only marginal changes with changes in holding size due to the fact that the large size of holding itself was less than 2 hectares. But in income groups also there was no significant changes on capital inputs. Family labour utilization was more on small holding groups and in lowest income groups.

Cost of cultivation of banana also did not show much variation except in utilization of family labour. This may be due to cultivation of banana as an intercrop in coconut gardens even on large farms.

The maintenance cost of coconut and arecanut was leaving high profits even with little care and expenditure on fertilizers, plant protection, etc.

Dairy enterprise was taken up on all holding size groups. The returns from dairy enterprise showed that they can contributed substantially to the family income of small cultivators. But high price of the straw is a limiting factor for small farms.

House hold Economy

HOUSEHOLD ECONOMY

A farm is a socio-economic unit which provides not only income to the farmer but also a source of happiness to him and his family. The welfare of the farm family largely depends on the level of income from the farm unit and other different sources. The level of income is the main factor which influences the purchasing power of the farmers to acquire the essentials and other items which ultimately decide their standard of living. The purchasing power influences the pattern of consumption, both quantitatively as well as qualitatively.

This part of the study is therefore devoted to examine the pattern of household income, expenditure, consumption and savings. These will give some idea about the standard of living of the farmers in the study area.

Sources of Household Income

Crop and livestock production are not the only income sources of the farm families in India, but there are also other sources from which the farm families derive their income. Income from non-farm sources are no less important in contributing to the total earnings of the farm families. On the small farms particularly, income from sources other than agriculture assumes great importance. In the case of

Kerala the income from other sources plays a crucial role in family status and livelihood in the society, whatever may be the size of holding. For this reason, net incomes received from all sources aggregated and the relevant details are presented in Tables 7.1 and 7.2. While the former table shows the details holding sizewise, the latter shows them according to income groups. For the present exercise income from crops and livestock have been worked out net of working costs.

On the sample farms the average total net income per family was Rs.16,641.92 of which only 47.95 per cent (Rs.7980.25) was from crop production. This income followed by income from service contributed 33.83 per cent (Rs.5629.98) of the total income. The income from trade contributed 6.51 per cent (Rs.1084.00) to the total income. Livestock, labour and other sources contributed 3.83 per cent, 4.28 per cent and 3.59 per cent to the total income in the same order. Including livestock enterprises, the proportion of income from agriculture to total was 51.81 per cent.

The proportion of income from crop production increased with increase in holding size from 22.69 per cent of the total income in the smallest holding group to 71.31 per cent in the large holding group. Income from service contributed substantially to family incomes in all the holding size groups. At least one person from each household was employed

Table 7.1. Income of the households on sample farms from different sources (figures in rupees)

Sources	Holding size groups				
	Smallest	Small	Medium	Large	Overall
Income from crops (at working cost)	2474.39 (22.69)	5495.40 (37.08)	9248.80 (50.32)	19191.35 (71.31)	7980.25 (47.95)
Income from livestock (at working cost)	334.19 (3.06)	568.91 (3.83)	911.62 (4.96)	969.29 (3.60)	637.73 (3.84)
Labour	1698.53 (15.57)	521.15 (3.52)	-	-	713.00 (4.28)
Trade	1288.24 (11.81)	1446.15 (9.76)	1050.00 (5.71)	300.00 (1.11)	1084.00 (6.51)
Service	4322.65 (39.64)	6282.92 (42.40)	6481.20 (35.26)	6152.40 (22.86)	5629.98 (33.83)
Others	787.53 (7.23)	504.62 (3.41)	690.00 (3.75)	300.00 (1.12)	596.96 (3.59)
Total income	10905.53 (100.00)	14819.15 (100.00)	18381.62 (100.00)	26913.04 (100.00)	16641.92 (100.00)
Income (per capita)	1808.55	2293.99	2588.96	3737.92	2525.33
Total expenditure	9989.24	11637.57	14636.00	16422.88	12539.29
Savings	+916.29	+3181.58	+3745.62	+10490.16	+4102.63
Savings (per capita)	+151.96	+492.50	+527.55	+1456.97	+622.55

Figures in parenthesis are percentages to total

somewhere. Income from service accounted for 39.64 per cent (Rs.4322.65) of the total income in the smallest holding group, 42.4 per cent (Rs.6282.92) of the total income in the small holding group, 35.26 per cent (Rs.6481.20) in the medium holding group and 22.86 per cent (Rs.6152.40) in the large holding group. The income from trade varied from 11.81 per cent in the smallest holding group to only 1.11 per cent in the large holding group. Income from livestock increased from 3.06 per cent (Rs.334.19) in the smallest holding group to 4.96 per cent (Rs.911.62) in the medium holding group but decreased to 3.6 per cent (Rs.969.29) in the large holding group. Income from labour was observed in the first two holding groups only. Both in the smallest as well as in the small sized holdings agricultural income constituted much less than one half of the total income. The proportion of income from sources other than crop and livestock enterprises showed a decrease with increase in holding size. It clearly showed that the small sized farms depended substantially on activities other than farm business for their livelihood.

Among income groups also the proportion of income from crop production increased with increase in income from 33.39 per cent (Rs.3159.55) in the lowest income group to 56.09 per cent (Rs.18421.41) in the high income group. The proportion of income from livestock was almost same in the

Table 7.2. Income of the households on sample farms from different sources (figures in rupees)

Sources	Income groups				
	Lowest	Lower	Middle	High	Overall
Inoome from crops (at working cost)	3159.55 (33.39)	6431.04 (47.56)	11877.14 (50.58)	18421.41 (56.09)	7980.25 (47.95)
Income from livestock (at working cost)	335.12 (3.54)	462.65 (3.42)	771.00 (3.28)	1626.46 (4.95)	637.73 (3.84)
Labour	1447.06 (15.29)	650.00 (4.81)	-	-	713.00 (4.28)
Trade	1217.65 (12.87)	805.88 (5.96)	1133.33 (4.83)	1371.43 (4.18)	1084.00 (6.51)
Service	2363.83 (24.98)	4938.71 (36.52)	9367.33 (39.89)	10435.71 (31.78)	5629.98 (33.83)
Others	938.71 (9.92)	234.71 (1.74)	333.33 (1.42)	985.71 (3.00)	596.96 (3.59)
Total income	9461.92 (100.00)	13522.99 (100.00)	23482.13 (100.00)	32840.72 (100.00)	16641.92 (100.00)
Income (per capita)	1665.83	2006.38	3018.27	4738.92	2525.33
Total expenditure	9455.36	12503.75	14892.71	17764.88	12539.29
Savings	+ 6.56	+1019.24	+8589.42	+15075.84	+4102.63
Savings (per capita)	+ 1.15	+151.22	+1104.04	+ 2175.45	+622.55

Figures in parenthesis are percentages to total

first three income groups but increased in the high income group. Income from labour was observed only on the first two income groups at the bottom. The proportion of income from trade showed a decrease with increase in total income from 12.87 per cent in the lowest income group to 4.18 per cent in the high income group. But in absolute terms the income from trade increased with increase in total household income except in the lowest income group. The contribution of income from service increased with increase in income from 25 per cent in the lowest income group to 40 per cent in the middle income group but it decreased to 32 per cent in the high income group. However in absolute terms income from service increased steadily with the increase in the gross income of families.

The average per capita income was Rs.2525.33 and savings were Rs.622.55. Income per capita ranged from Rs.1808.55 in the smallest holding group to Rs.3737.92 in the large holding group. Savings were positive even in the smallest holding size. The savings per capita also increased with increase in holding size from Rs.151.96 in the smallest holding group to Rs.1456.97 in the large holding group.

Among income groups, the per capita income was Rs.1665.83 in the lowest income group which increased to Rs.4738.92 in the high income group. Savings also increased

with increase in income. The per capita saving was almost zero (Rs.1.15) in the lowest income group but it rose to Rs.2175.45 in the high income group. Considering the fact that over income data from crop and livestock enterprises are net of working costs only, and however do not completely account for all the costs, it is more likely that savings in households in the lowest income groups and perhaps in the smallest holding size group were in fact, negative.

Borrowings

In order to meet the financial needs, cultivators borrow money from different sources. The information on the extent of loan taken and important sources of borrowing by the sample farmers is given in Tables 7.3 and 7.4.

It can be observed that at the overall level the total amount borrowed per farmer from different sources was Rs.1760. Of the total loan, the share of the Service Co-operative Bank was the highest (31.25%) followed by Government employees' Co-operative Sooieties (30.68%), Nationalised Banks (20.74%), Government (7.39%), other commercial banks (5.68%) and Land Development Bank (4.26%). Among holding size groups, the total amount of loan per household increased with holding size, but it showed a decline in the large holding size group.

Government loans were obtained by the smallest holding size group farmers only and they accounted for one-fourth of

Table 7.3. Extent of loan taken from different sources in holding size groups. (average amount of loan per household in rupees)

Holding size group	Govern-ment	Land Deve-lopment Bank	Service Co-opera-tive Bank	Nationa-lised Banks	Other Commer-cial Banks	Government employees' Co-operative Societies	Total amount
Smallest	352.94 (25.81)	-	588.24 (43.01)	73.53 (5.38)	294.12 (21.50)	58.82 (4.31)	1367.65 (100.00)
Small	-	-	211.54 (14.86)	211.54 (14.87)	-	1000.00 (70.27)	1423.08 (100.00)
Medium	-	-	775.00 (24.80)	1150.00 (36.80)	-	1200.00 (38.40)	3125.00 (100.00)
Large	50.00 (3.33)	375.00 (25.00)	700.00 (46.67)	275.00 (18.33)	- -	100.00 (6.67)	1500.00 (100.00)
Overall	130.00 (7.39)	75.00 (4.26)	550.00 (31.25)	365.00 (20.74)	100.00 (5.68)	540.00 (30.68)	1760.00 (100.00)

Figures in parenthesis are percentages to total

that group's total loan. Loans from Land Development Bank were obtained only by the large size holding accounting for 25 per cent of its total loan. Loans from Service Co-operative Banks was highest in the large holding size group accounting 46.67 per cent of its total loans followed by the smallest holding size group (43.01%), medium holding size group (24.8%) and the small holding size group (14.86%). Loans from Nationalised banks as a proportion to total loans was the highest in the medium holding size group account for 36.80 per cent of its total loan followed by the large holding group accounting 18.33 per cent of its total loan. It was minimum in the smallest holding size group. This pattern may be due to security problems arise with small farmers. Other commercial banks supplied loans to only smallest holding farmers accounting for 21.50 per cent of that group's total loan.

Government employees' co-operative societies as a source of loans was utilized to the greatest extent by small holding group. As much as 70 per cent of the total loans in that group was obtained by this source. Large holding group obtained around 7 per cent of the total and smallest holding group obtained 4.3 per cent of the total from this source.

Among income groups, Government loans accounted for the highest share of the total loan in the lowest income group. But in absolute terms highest amount was accounted by high

Table 7.4. Extent of loan taken from different sources in income groups
(Average amount of loan per household in rupees)

Income group	Govern-ment	Land Deve-lopment Bank	Service Co-opera-tive Bank	Nationa-lised Banks	Other Commer-cial Banks	Government employees' Co-operative Societies	Total amount
Lowest	176.47 (22.22)	-	441.18 (55.56)	117.65 (14.82)	-	58.82 (7.41)	794.12 (100.00)
Lower	-	-	558.82 (39.18)	514.71 (36.08)	294.12 (20.62)	58.82 (4.12)	1426.47 (100.00)
Middle	333.33 (13.95)	-	527.78 (22.09)	194.44 (8.14)	-	1333.33 (55.81)	2388.89 (100.00)
High	71.43 (1.74)	535.71 (13.04)	821.43 (20.00)	821.43 (20.00)	-	1857.14 (45.22)	4107.14 (100.00)
Overall	130.00 (7.39)	75.00 (4.26)	550.00 (31.25)	365.00 (20.74)	100.00 (5.68)	540.00 (30.68)	1760.00 (100.00)

Figures in parenthesis are percentages to total

income group. Land Development Bank loan constituted 13 per cent of the total loan in the high income group and it was absent in other income groups. Service Co-operative Bank's share decreased with increase in income from 55.56 per cent in the lowest income group to 20 per cent in the high income group. But in absolute terms it showed increase with increase in income except in the middle income group. Nationalised Banks contributed 36.08 per cent of the total loan taken in the lower income group followed by the high income group where they accounted for 20 per cent of that group's total loan. But in absolute terms, Nationalised Banks contributed Rs.821.43 per household in the highest income group where as in the middle income group it was only Rs.514.71 per household. Other commercial banks accounted for 20.62 per cent (Rs.294.12) of the total loan taken by the lower income group. In other income groups it was absent.

Employees' Co-operative Societies accounted for 55.81 per cent (Rs.1333.33) of the total loan in the middle income group, 45.22 per cent (Rs.1857.14) in the high income group, 7.41 per cent (Rs.58.82) in the lowest income group and 4.12 per cent (Rs.58.82) in the lower income group. It is interesting to note that the total loan from all sources increased with inorease in income. It was Rs.794.12 per household in the lowest income group and it increased to Rs.4107.14 per household in the high income group.

Consumption expenditure

The important food grain consumed in the area is rice with negligible quantities of wheat and tapioca. The relevant figures are shown according to holding size groups in Table 7.5 and according to income groups in Table 7.6.

It can be seen that average consumption of rice per family was 881.10 kg per year and per adult unit 148.60 kg. Among holding size groups, as well as income groups there was not much difference in the consumption of rice per adult unit. Among holding size groups, per adult consumption of wheat was highest in the small holding size group. Per adult unit tapioca consumption was highest in the large holding size group (5.48 kg). Among income groups, per adult consumption of wheat (3.22 kg) as well as tapioca (7.18 kg) was highest in the high income group. The overall average of per adult consumption of wheat was 1.52 kg and that of tapioca was 3.26 kg.

Pulses are very important in the human diet, because they supply comparatively better quality nutrients. In the study area the important pulses consumed are cowpea, green-gram, and also Bengal gram to a certain extent. It was observed that the average per adult consumption was 7.99 kg and per family it was 47.4 kg. Among holding size groups, the quantity of pulses consumed per family increased with

Table 7.5. Quantities of cereals and pulses consumed in holding size groups (figures in kg)

Items	Smallest	Small	Medium	Large	Average
Rice:					
Per family	792.25	857.01	968.19	976.38	881.10
Per adult	147.20	152.50	146.90	148.60	148.60
Wheat:					
Per family	2.88	14.00	7.20	15.00	9.06
Per adult	0.53	2.49	1.09	2.28	1.52
Tapioca:					
Per family	13.41	18.27	14.25	36.00	19.36
Per adult	2.49	3.25	2.16	5.48	3.26
Pulses:					
Per family	38.82	45.23	52.80	59.40	47.40
Per adult	7.22	8.05	8.01	9.04	7.99

Table 7.6. Quantities of oereals and pulses consumed in income groups (figures in kg)

Items	Lowest	Lower	Middle	High	Average
Rice:					
Per family	775.06	898.53	998.70	945.09	881.10
Per adult	150.21	48.76	149.06	150.97	148.60
Wheat:					
Per family	2.53	9.71	11.56	20.14	9.06
Per adult	0.49	1.60	1.72	3.22	1.52
Tapioca:					
Per family	16.65	16.94	9.17	44.93	19.36
Per adult	3.23	2.80	1.37	7.18	3.26
Pulses:					
Per family	35.47	48.53	47.67	60.43	47.40
Per adult	6.87	8.03	8.61	9.65	7.99

increase in holding size. Consumption per adult unit also showed an increase. Among income groups, there was a striking difference in the consumption of pulses. The per family quantity increased with increase in income from 35.47 kg in the lowest income group to 60.43 kg in the high income group and per adult quantity consumed increased from 6.87 kg in the lowest income group to 9.65 kg in the high income group.

Expenditure on protective food

Food items rich in proteins, vitamins and minerals are termed as protective foods. This group includes, the items like milk, eggs, meat, vegetables and fruits etc. They help in keeping the body fit for doing any physical work. The expenditure on important items of protective food on the basis of per family and per adult unit is shown according to holding size groups in Table 7.7 and according to income groups in Table 7.8. It was observed that the expenditure per family on the protective food items was Rs.4329.74 per year which came to Rs.730.15 per adult unit per year. It was interesting to note that amongst the items of protective food the expenditure on fish was highest (13.84%) and Rs.165.18 per adult unit. Expenditure on milk and milk products per adult unit was Rs.127.48 (10.65%),on edible oil was Rs.124.80 (10.45%) and on beverages was Rs.84.74 (7.10%).

Among holding size groups the expenditure on protective food slightly increased with increase in holding size except

Table 7.7. Constituents of expenditure on different food items in holding size groups (figures in Rs)

Items		Smallest	Small	Medium	Large	Average
Rice	Per family	2153.42	2447.48	2845.13	2876.84	2512.90
	Per adult	400.26	435.49	431.73	437.88	423.76
	% to total	36.20	36.12	35.55	33.96	35.50
Tapioca	Per family	6.70	9.17	7.12	18.00	9.69
	Per adult	1.25	1.63	1.08	2.74	1.64
	% to total	0.11	0.14	0.09	0.21	0.14
Wheat	Per family	5.55	27.06	15.30	30.00	17.98
	Per adult	1.03	4.81	2.32	4.57	3.03
	% to total	0.09	0.40	0.19	0.35	0.25
Pulses	Per family	170.42	199.62	233.84	262.75	209.16
	Per adult	31.68	35.52	35.48	39.99	35.78
	% to total	2.86	2.95	2.92	3.10	2.95
Sugars	Per family	178.50	182.38	203.32	233.33	195.44
	Per adult	33.18	32.45	30.85	35.51	32.97
	% to total	3.00	2.69	2.54	2.75	2.76
Milk and milk products	Per family	580.96	703.83	846.18	1031.12	755.98
	Per adult	107.99	125.24	128.40	156.94	127.48
	% to total	9.76	10.39	10.57	12.17	10.68
Edible oils	Per family	574.97	720.46	879.63	906.70	740.08
	Per adult	106.87	128.20	133.48	138.01	124.80
	% to total	9.66	10.63	10.99	10.70	10.45
Grocery item	Per family	145.21	149.35	181.75	200.75	164.70
	Per adult	26.99	26.57	27.58	30.56	27.79
	% to total	2.44	2.20	2.27	2.37	2.33
Vegetable	Per family	237.28	253.90	323.96	321.24	275.73
	Per adult	44.10	45.18	49.16	48.89	46.50
	% to total	3.99	3.75	4.05	3.79	3.89
Meat	Per family	313.21	367.35	477.40	509.20	399.32
	Per adult	58.22	65.36	72.44	77.50	67.34
	% to total	5.26	5.42	5.96	6.01	5.64
Fish	Per family	869.13	910.47	1151.91	1084.61	979.53
	Per adult	161.55	162.01	174.80	165.09	165.18
	% to total	14.61	13.44	14.39	12.80	13.84
Egg	Per family	101.26	126.08	140.38	158.00	126.88
	Per adult	18.82	22.43	21.30	24.05	21.40
	% to total	1.70	1.86	1.76	1.87	1.79

(contd.)

Table 7.7. continued

Items		Smallest	Small	Medium	Large	Average
Beverages	- Per family	453.74	504.73	495.85	589.20	502.51
	Per adult	84.34	89.81	75.24	89.68	84.74
	% to total	7.63	7.45	6.20	6.96	7.10
Coconuts	- Per family	159.14	174.49	201.83	248.69	189.57
	Per adult	29.58	31.05	30.63	37.85	31.97
	% to total	2.67	2.57	2.52	2.94	2.68
Total protective food	Per family	3613.40	4093.04	4902.21	5282.84	4329.74
	Per adult	671.64	728.30	743.88	804.08	730.15
	% to total	60.73	60.40	61.25	62.36	61.15
Total amount	- Per family	5949.49	6776.37	8003.60	8470.43	7079.47
	Per adult	1105.86	1205.75	1214.49	1289.26	1193.86
	% to total	100.00	100.00	100.00	100.00	100.00

in the first two groups. The proportion of expenditure on fish was higher than on any other item of protective food in all holding size groups. Even though proportion spent on fish did not show any pattern of change with holding size per adult unit consumption increased from Rs.161.55 in the smallest holding size group to Rs.174.80 in the medium holding size group but decreased to Rs.165.09 in the large holding size group. The proportion spent on milk and milk products increased from 9.76 per cent in the smallest holding size group to 12.17 per cent in the large holding size group. Per adult unit expenditure on milk and milk products also increased from Rs.107.99 in the smallest holding size group to Rs.156.94 in the large holding size group. The per adult expenditure on edible oils also increased from Rs.106.87 in the smallest holding size group to Rs.138.01 in the large holding size group. The proportion of expenditure on meat also increased with holding size from 5.26 per cent of the total expenditure in the smallest holding size group to 6.01 per cent in the large holding size group. The proportion of expenditure as well as expenditure per adult unit on beverages did not show any pattern of change. The per adult unit total expenditure on food consistently increased with increase in holding size from Rs.1105.86 in the smallest holding size group to Rs.1289.26 in the large holding size group.

Among income groups the proportion of expenditure on protective food increased from 57.78 per cent of the total expenditure on food (Rs.620.36 per adult) in the lowest income group to 66.61 per cent (Rs.974.77 per adult) in the high income group. Among protective foods the proportion spent on fish was highest in all income groups except in the high income group where expenditure on milk and milk products was the biggest items. Among income groups the proportion of expenditure on fish increased with increase in income, but decreased in the high income group. Expenditure per adult unit increased consistently with income from Rs.135.08 to Rs.202.69. The proportion of expenditure on milk and milk products was 8.34 per cent (Rs.89.58 per adult) in the lowest income group and it increased to 14.60 per cent (Rs.213.61 per adult) in the high income group.

The per adult unit expenditure on meat as well as proportion of expenditure increased with increase in income from Rs.56.40 per adult (5.25%) in the lowest income group to Rs.87.05 (5.95%) in the high income group. The per adult expenditure on beverages was Rs.83.10,and Rs.80.84, Rs.87.23 and Rs.97.56 respectively in the lowest, lower, middle and high income groups. The expenditure on protective food items increased consistently with income also as was the case with holding size. The total expenditure on food per adult also showed a consistent increase with level of income of the family.

Table 7.8. Constituents of expenditure on different food items in income groups (figures in Rs)

Items		Lowest	Lower	Middle	High	Average
Rice -	Per family	2169.49	2570.38	2883.37	2730.98	2512.90
	Per adult	420.44	425.56	430.35	436.26	423.76
	% to total	39.16	36.19	34.63	29.82	35.50
Tapioca-	Per family	8.32	8.49	4.59	22.50	9.69
	Per adult	1.61	1.41	0.69	3.59	1.64
	% to total	0.15	0.12	0.06	0.25	0.14
Wheat -	Per family	4.81	20.19	22.29	39.09	17.98
	Per adult	0.93	3.34	3.33	6.24	3.03
	% to total	0.09	0.28	0.27	0.43	0.25
Pulses -	Per family	155.89	214.78	255.71	265.06	209.16
	Per adult	30.21	35.56	38.17	42.34	35.28
	% to total	2.81	3.02	3.07	2.89	2.95
Sugars -	Per family	153.43	188.29	245.79	250.10	195.44
	Per adult	29.73	31.17	36.69	39.95	32.97
	% to total	2.77	2.65	2.95	2.73	2.76
Milk and	Per family	462.27	735.82	896.83	1337.17	755.98
milk	Per adult	89.58	121.82	133.86	213.61	127.48
produces	% to total	8.34	10.36	10.77	14.60	10.68
Edible -	Per family	569.09	742.75	854.00	1002.36	740.08
oils	Per adult	110.29	122.97	127.46	160.12	124.80
	% to total	10.27	10.46	10.26	10.94	10.45
Grocery	per family	121.35	164.82	201.11	222.86	164.70
item	Per adult	23.52	27.29	30.02	35.60	27.79
	% to total	2.19	2.32	2.42	2.43	2.33
Vegeta-	Per family	220.19	280.43	268.73	408.17	275.73
ble	Per adult	42.67	46.43	40.11	65.20	46.50
	% to total	3.97	3.95	3.23	4.46	3.89
Meat -	Per family	291.00	403.12	483.50	544.93	399.32
	Per adult	56.40	66.74	72.16	87.05	67.34
	% to total	5.25	5.68	5.81	5.95	5.64
Fish -	Per family	697.04	976.40	1294.03	1268.83	979.53
	Per adult	135.08	161.66	193.15	202.69	165.18
	% to total	12.58	13.75	15.54	13.85	13.84
Egg -	Per family	95.44	124.59	133.89	199.82	126.88
	Per adult	18.50	20.62	19.98	31.92	21.40
	% to total	1.73	1.75	1.61	2.18	1.79

(contd.)

Table 7.8. continued

Items		Lowest	Lower	Middle	High	Average
Beverages	- Per family	428.82	488.26	584.44	610.71	502.51
	Per adult	83.10	80.84	87.23	97.56	84.74
	% to total	7.74	6.87	7.02	6.67	7.10
Coconut	- Per family	162.51	184.35	198.06	257.11	189.57
	Per adult	31.49	30.52	29.56	41.07	31.97
	% to total	2.93	2.60	2.38	2.81	2.68
Total pro-	Per family	3201.14	4288.83	5160.38	6102.06	4329.74
tective	Per adult	620.36	710.06	770.22	974.77	730.15
food	% to total	57.78	60.38	61.97	66.61	61.15
Total	- Per family	5539.65	7102.67	8326.34	9159.69	7079.47
amount	Per adult	1073.55	1175.93	1242.76	1463.20	1193.86
	% to total	100.00	100.00	100.00	100.00	100.00

Total family expenditure

The total family expenditure on sample households has been shown according to holding size groups in Table 7.9 and according to income groups in Table 7.10. The salient features are discussed below.

On an average 56.46 per cent of the total family expenditure was on food items and it was Rs.1193.86 per adult unit. The average per adult unit expenditure on clothes was Rs.263.57, which accounted for 12.46 per cent of the family expenditure. The proportion of expenditure on fuel and lighting was 6.13 per cent of the total family expenditure (Rs.129.72 per adult unit). Housing constituted 7.33 per cent of the total expenditure and Rs.155.03 per adult unit and tobacco and liquor constituted 4.83 per cent and Rs.102.19 per adult unit. Travel constituted 3.66 per cent of the total expenditure (Rs.77.39 per adult). The average per adult total expenditure was Rs.2144.56.

Among holding size groups, the proportion of expenditure on food decreased with increase in holding size from 59.56 per cent of the total expenditure in the smallest holding size group to 51.58 per cent in the large holding size groups.

The proportion of expenditure on protective food also decreased with increase in holding size from 36.17 per cent of the total family expenditure in the smallest holding size

Table 7.9. Constituents of total family expenditure per year in holding size groups (figures in Rs)

Items		Smallest	Small	Medium	Large	Average
Cereals and tapioca	Per family	2165.67	2483.71	2867.55	2924.84	2540.57
	Per adult	402.54	441.93	435.13	445.19	428.43
	% to total	21.68	21.34	19.59	17.81	20.26
Pulses	Per family	170.42	199.62	233.84	262.75	209.16
	Per adult	31.68	35.52	35.48	39.99	35.28
	% to total	1.71	1.72	1.60	1.60	1.67
Protective food	Per family	3613.40	4093.04	4902.21	5282.84	4329.74
	Per adult	671.64	728.30	743.88	804.08	730.15
	% to total	36.17	35.17	33.49	32.17	34.53
Total food	Per family	5949.49	6776.37	8003.60	8470.43	7079.47
	Per adult	1105.86	1205.75	1214.49	1289.26	1193.86
	% to total	59.56	58.23	54.68	51.58	56.46
Clothing and footwear	Per family	850.25	1398.08	2100.00	2452.00	1562.98
	Per adult	158.04	248.77	318.66	373.21	263.57
	% to total	8.51	12.01	14.35	14.93	12.46
Fuel and lighting	Per family	689.60	741.82	808.95	900.66	769.26
	Per adult	128.18	131.99	122.75	137.09	129.72
	% to total	6.90	6.37	5.53	5.48	6.13
Education	Per family	111.76	151.08	362.50	489.50	153.13
	Per adult	20.77	26.88	55.01	74.51	25.82
	% to total	1.12	1.30	2.48	2.98	1.23
Medicine	Per family	216.76	326.73	486.00	660.00	387.84
	Per adult	40.29	58.14	73.75	100.46	65.40
	% to total	2.17	2.81	3.32	4.02	3.09
Travel	Per family	358.97	437.38	575.40	540.25	458.90
	Per adult	66.72	77.83	87.31	82.23	77.39
	% to total	3.59	3.75	3.93	3.29	3.66
Recreation	Per family	287.79	360.19	481.00	647.50	417.19
	Per adult	53.49	64.09	72.99	98.55	70.35
	% to total	2.88	3.10	3.29	3.94	3.33
Housing	Per family	865.50	791.70	895.00	1201.20	919.35
	Per adult	160.87	140.87	135.81	182.83	155.03
	% to total	8.66	6.80	6.12	7.31	7.33

(contd.)

Table 7.9. continued

Items		Smallest	Small	Medium	Large	Average
Tobacco and Liquor	Per family	573.68	532.49	676.55	685.84	605.98
	Per adult	106.63	94.75	102.65	104.39	102.19
	% to total	5.75	4.58	4.62	4.18	4.83
Others -	Per family	85.44	121.73	247.00	375.50	185.19
	Per adult	15.88	21.66	37.48	57.15	31.23
	% to total	0.86	1.05	1.68	2.29	1.48
Total expen-diture	Per family	9989.24	11637.57	14636.00	16422.88	12539.29
	Per adult	1856.73	2070.73	2220.90	2499.68	2114.56
	% to total	100.00	100.00	100.00	100.00	100.00

group to 32.17 per cent of the total expenditure in the large holding size group. The proportion of expenditure on clothing increased with increase in holding size from 8.51 per cent of the total family expenditure to 14.93 per cent of the total expenditure in the large holding group.

The proportion of expenditure on fuel and lighting was 6.90 per cent of the total expenditure in the smallest holding size group. It decreased to 5.48 per cent of the total expenditure in the large holding size group.

Expenditure on education constituted only 1.12 per cent of the total expenditure in the smallest holding size groups which increased to 2.98 per cent of the total in the large holding size group. The per adult expenditure on travel was Rs.66.72 in the smallest holding size group and it increased to Rs.575.40 in the medium holding size group, but decreased to Rs.540.25 in the large holding size group. The proportion of expenditure on recreation increased from 2.88 per cent of the total expenditure (Rs.53.49 per adult) in the smallest holding size group to 3.94 per cent (Rs.98.55 per adult) in the large holding size group.

Among income groups, the proportion of expenditure on food decreased with increase in income. But the proportion of expenditure on protective food items showed an increase with increase in income. This was quite different from the result for holding size group. The proportion of expenditure

Table 7.10. Constituents of total family expenditure per year in income groups (figures in Rs)

Items		Lowest	Lower	Middle	Large	Average
Cereals and tapioca	Per family	2182.62	2599.06	2910.25	2792.57	2540.57
	Per adult	422.98	430.31	434.37	446.09	428.43
	% to total	23.08	20.79	19.54	15.72	20.26
Pulses -	Per family	155.89	214.78	255.71	265.06	209.16
	Per adultm	30.21	35.56	38.17	42.34	35.78
	% to total	1.65	1.72	1.72	1.49	1.67
Protective food	Per family	3201.14	4288.83	5160.38	6102.06	4329.74
	Per adult	620.36	710.06	770.22	974.77	730.15
	% to total	33.86	34.30	34.65	34.35	34.53
Total food	Per family	5539.65	7102.67	8326.34	9159.69	7079.47
	Per adult	1073.55	1175.93	1242.76	1463.20	1193.86
	% to total	58.59	56.81	55.91	51.56	56.46
Clothing and footwear	Per family	783.53	1579.71	2069.35	2764.29	1562.98
	Per adult	151.85	261.54	308.86	441.58	263.57
	% to total	8.29	12.63	13.90	15.56	12.46
Fuel and lighting	Per family	680.49	777.78	819.73	899.21	769.26
	Per adult	131.88	128.77	122.35	143.64	129.72
	% tototal	7.20	6.22	5.50	5.06	6.13
Education	Per family	134.71	157.29	357.78	600.00	153.13
	Per adult	26.11	26.04	53.40	95.85	25.82
	% to total	1.42	1.26	2.40	3.38	1.23
Medicine	Per family	243.50	388.97	462.23	640.00	387.84
	Per adult	47.19	64.40	68.99	102.24	65.40
	% to total	2.58	3.11	3.10	3.60	3.09
Travel	Per family	325.09	485.65	478.06	694.29	458.90
	Per adult	63.00	80.41	71.35	110.91	77.39
	% to total	3.44	3.88	3.21	3.91	3.66
Recreation	Per family	271.47	399.83	533.05	664,28	417.19
	Per adult	52.61	66.20	79.56	106.12	70.35
	% to total	2.87	3.20	3.58	3.74	3.33

(contd.)

Table 7.10. continued

Items		Lowest	Lower	Middle	Large	Average
Housing -	Per family	901.35	803.25	981.00	1165.75	919.35
	Per adult	174.68	132.99	146.42	186.22	155.03
	% to total	9.53	6.43	6.59	6.56	7.33
Tobacco and Liquor	Per family	477.92	611.70	620.44	884.51	605.98
	Per adult	92.62	101.78	92.60	141.21	102.19
	% to total	5.05	4.89	4.17	4.98	4.83
Others	Per family	97.65	196.90	244.73	292.86	185.19
	Per adult	18.92	32.60	36.53	46.78	31.23
	% to total	1.03	1.57	1.64	1.65	1.48
Total expen-diture	Per family	9455.36	12503.75	14892.71	17764.88	12539.29
	Per adult	1832.41	2070.16	2222.82	2837.75	2114.56
	% to total	100.00	100.00	100.00	100.00	100.00

on food was 58.59 per cent of the total expenditure in the lowest income group and it decreased to 51.56 per cent of the total expenditure in the high income group. But as already indicated per adult expenditure on food actually increased from Rs.1073.55 in the lowest income group to Rs.1463.20 in the high income group. The per adult expenditure on clothing was Rs.151.85 in the lowest income group which increased to as much as Rs.441.58 in the high income group. The expenditure on fuel and lighting per adult unit as well as proportion showed a decrease with increase in income. This was perhaps due to conversion from use of fire wood to gas, kerosene, electricity, etc. The expenditure on education was only Rs.26.11 per adult unit (1.42%) in the lowest income group which increased to as much as Rs.95.85 per adult (3.38%) in the high income group. The proportion of expenditure on travel did not show much variation but the expenditure per adult unit was Rs.63.00 in the lowest income group and Rs.80.41, Rs.71.35 and Rs.110.91 in the low, middle and high income groups respectively. The expenditure per adult on recreation was Rs.52.61 (2.87%) in the lowest income group and it increased to Rs.106.12 (3.74%) in the high income group. The expenditure on housing was Rs.174.68 per adult (9.43%), Rs.146.42 (6.59%) and Rs.186.22 (6.56%) in the low, middle and high income groups respectively. The expenditure on tobacco and liquor was Rs.92.62 per adult (5.05 per cent) in the lowest income group and Rs.101.28 (4.89 per cent),

Rs.92.60 (4.17 per cent) and Rs.141.21 (4.98 per cent) in the low, middle and high income groups respectively. The total expenditure per adult was only Rs.1832.41 in the lowest income group which increased to as much as Rs.2837.75 per adult in the high income group. The pattern of expenditure of the sample families was by and large was in conformity with the Engel's Law of family expenditure.

Investment on household articles

Food, clothing and shelter are the basic requirements of human life. Besides these, there are other items which can be considered as comforts and luxuries which increase the family welfare and happiness. It is difficult to differentiate comforts and luxuries because a thing may give comfort to one while the same may be luxury to the other. Therefore, the items of comforts and luxuries were considered together and investment on each of the item coming under this class has been worked out. The total investment per family and per capita on these items are presented according to holding size groups in Table 7.11 and according to income groups in Table 7.12.

The important items of comforts and luxuries were radios, watches, furniture, utensils, bicycles, fans, etc. (even though investment on gold ornaments was quite important in all holding size groups and income groups on account of the fear of the respondents to furnish the correct details, it was not accounted).

Table 7.11. Investment on comforts and luxurious household goods in size groups (Figures in Rs)

Holding size groups	Radio and Tapere-corders	Watch	Furni-ture	Utensils	Sewing machine	Bicycle	Motor cycle	Fan	Electric Iron	Total
Smallest:										
Per family	320.00	231.62	296.76	510.29	44.12	177.21	-	00.00	17.50	1697.50
Per capita	53.07	38.41	49.21	84.63	7.32	29.39	-	16.58	2.90	281.51
% to total	18.85	13.65	17.48	30.06	2.60	10.44	-	5.89	1.03	100.00
Small:										
Per family	605.19	313.46	366.54	725.00	201.92	219.81	548.08	282.69	55.38	3318.07
Per capita	93.68	48.52	56.74	112.23	31.26	34.03	84.84	43.76	8.57	513.63
% to total	18.24	9.45	11.05	21.85	6.08	6.62	16.52	8.52	1.67	100.00
Medium:										
Per family	426.50	425.75	507.50	795.00	163.45	276.25	-	289.50	60.50	2944.45
Per capita	60.07	59.96	71.40	111.97	23.02	38.91	-	40.77	8.52	414.71
% to total	14.48	14.46	17.24	27.00	5.55	9.38	-	9.83	2.06	100.00
Large:										
Per family	824.25	492.50	750.50	950.00	222.50	164.00	250.00	610.50	64.25	4328.50
Per capita	114.48	68.40	104.24	131.94	30.90	22.78	34.72	84.79	8.92	601.18
% to total	19.04	11.38	17.34	21.95	5.14	3.79	5.78	14.10	1.48	100.00
Overall:										
Per family	516.40	343.90	447.80	711.00	144.69	205.45	192.50	287.50	45.30	2894.44
Per capita	78.35	52.19	67.95	107.89	21.96	31.18	29.21	43.63	6.87	439.22
% to total	17.84	11.88	15.47	24.56	5.00	7.10	6.65	9.93	1.57	100.00

Table 7.12. Investment on comforts and luxurious household goods in income groups (Figures in Rs)

Income groups	Radio and Tapere-corders	Watch	Furni-ture	Utensils	Sewing machine	Bicycle	Motor cycle	Fan	Electric Iron	Total
Lowest:										
Per family	389.85	208.82	228.68	482.35	-	163.21	-	78.24	19.56	1570.71
Per capita	68.64	36.76	40.26	84.92	-	28.73	-	13.77	3.44	276.53
% to total	24.82	13.29	14.56	30.71	-	10.39	-	4.98	1.25	100.00
Lower:										
Per family	457.21	264.85	402.35	725.00	167.65	204.74	242.65	296.03	48.38	2808.86
Per capita	67.84	39.30	59.70	107.57	24.87	30.38	36.00	43.92	7.18	416.74
% to total	16.28	9.43	14.32	25.81	5.97	7.29	8.64	10.54	1.72	100.00
Middle:										
Per family	576.11	516.67	509.72	891.67	250.00	299.17	611.11	322.22	61.67	4038.34
Per capita	74.05	66.41	65.52	114.61	32.13	38.45	78.55	41.42	7.93	519.07
% to total	14.27	12.79	12.62	22.08	6.19	7.41	15.13	7.98	1.53	100.00
High:										
Per family	890.00	641,79	1010.71	1000.00	304.93	189.29	-	730.36	79.29	4846.37
Per capita	128.43	92.61	145.85	144.30	44.00	27.31	-	105.39	11.44	699.33
% to total	18.36	13.24	20.85	20.63	6.29	3.92	-	15.07	1.64	100.00
Overall:										
Per family	516.30	343.90	447.80	711.00	144.69	205.45	192.50	287.50	45.30	2894.44
Per capita	78.35	52.19	67.95	107.89	21.96	31.18	29.21	43.63	6.87	439.22
% to total	17.84	11.88	15.47	24.56	5.00	7.10	6.65	9.93	1.57	100.00

The average total expenditure on these items was Rs.2894.44 per family which came to Rs.439.22 per capita. Of the total investment one-fourth was on utensils, followed by radio, transistors and taperecorders (17.84%), furniture (15.47%), watches (11.88%), fan (9.93%) and bicycles (7.1%). The investment on electronic equipment i.e., taperecorders and watches was high because of the availability of imported goods.

Investment on watches, furniture, utensils, fans and electric iron per family and per capita increased with holding size. But proportions spent on these items did not show any pattern of change. Investment on Radio-transistors, taperecorders and sewing machine increased with holding size except in the medium holding size group. In the case of investment on bicycle per family it increased with increase in holding size with the exception of large sized holdings. Investment on motorcycle was found only in small and large holding size groups.

Among income groups, the per family as well as per capita investment on radios, taperecorders, watches, furniture, utensils, sewing machine, fan and electric iron increased with increase in income. In the case of radios, taperecorders etc. it was Rs.389.85 per family in the lowest income group which increased to Rs.890 per family in the high income group. In the case of watches it was Rs.208.82 per family in the

lowest income group and it increased to Rs.641.79 in the high income group. Though the per family expenditure on utensils increased with income proportionate expenditure on this decreased with income. The investment on bicycle increased with increase in income from Rs.163.21 per family in the lowest income group to Rs.299.17 per family in the middle income group but it decreased to Rs.189.29 in the high income group. The investment on motor cycle was found only in the lower and middle income groups. The total investment on these items among different income groups ranged from Rs.1570.71 per family and Rs.276.53 per capita in the lowest income group to Rs.4846.37 per family and Rs.699.33 per capita in the high income group.

Summary

SUMMARY

Development of agriculture through intensive land use is one of the main themes in agricultural development in India. Adoption of scientific practices such as use of high yielding seeds, fertilizers, insecticides, etc. very much depends on assured irrigation facility. Though irrigation is practised since ancient times, the experience has been irrigation facilities created were not utilized efficiently. In order to remedy this problem special efforts are now being made to develop command areas of irrigation projects including the creation of Command Area Development Authorities, for irrigation projects so as to provide all infrastructure facilities for maximum and efficient utilization of irrigation water. The present study is a benoh mark survey on users of irrigation in Ollukkara Block of Peechi command area to examine methods and practices followed for cultivation, to assess the availability and use of resources, cost and income structure of the farm business, savings, investment, assets and debts to assess general social and economic conditions - education, consumption pattern, standard of living, etc. and the infrastructure facilities available in the area.

Two stage random sampling technique was used for the selection of households. Five panchayat wards, namely,

Mannuthy, Nadathara, Pattikad, Cherrakakkode and Pamboor were randomly selected from Ollukkara Block. From each ward 20 households were selected at random yielding a total of 100 sample households.

Primary data were collected from the selected households during March-April 1982 through personal interviews. Information relating to social, economic conditions of the farmers, crops grown, cost of cultivation, livestock and its maintenance, consumption pattern in household, etc. were collected during these interviews.

The average size of the family in the sample households was 6.59. Working population constituted 66.77 per cent of the total population. Illiterates were present in all holding size groups and income groups, but in the case of women the proportion of illiterates was higher than that of male. However, all these illiterates were more than 50 years in age. Each and every sample household was having atleast one share in the Service Co-operative Banks. The bulk of the sample holdings was very small in size, as much as 60 per cent of them had operational holdings of less than one hectare; but they accounted for only about 28 per cent of area operated. Of the total sample households 68 per cent were in the income groups of less than Rs.25000/- per annum and they accounted for 46.67 per cent of the operated area.

Cropping intensity in the sample farms was more than 160 per cent because of growing 2 to 3 crops of paddy. A substantial proportion of cropped area on most of the sample farms was devoted to paddy cultivation showing partly subsistence nature of farming and partly the specificity of land resources. But cash crops like coconut, arecanut, banana, etc. were also grown by including them in multiple cropping on garden lands.

Irrigation for paddy was mainly from Peechi canal for mundakan crop whereas for puncha it was from wells. For other crops the source was only well.

The dairy animals per farm increased with increase in holding size as well as income. The investment on sample farms was mostly on land and residential buildings. With regard to fertilizer use in agriculture, it was found that mainly nitrogenous fertilizers were being used, which may be due to the fact that an immediate crop response is observed, whereas in case of phosphorus and potash, no such immediate response is apparently noticed.

The cost of cultivation of paddy in viruppu season was highest both in the case of high yielding varieties and traditional ones. It was Rs.5692.11 for HYVs per hectare and Rs.5212.90 per hectare for traditional varieties. In both the cases cost on labour was around 30 per cent of the

total cost. Yield in viruppu season was lower. The cost of cultivation of high yielding varieties in mundakan season was Rs.5516.32/ha and that of traditional varieties Rs.4801.17 per hectare. There was a considerable improvement in the yield and quality of grain in this season. In puncha season, the cost of cultivation of HYVs was Rs.5615.26/ha and that of traditional varieties was Rs.4793.69/ha. The benefit cost ratio at total cost excluding rental value of own land for HYVs was 1.494 in viruppu, 1.702 in mundakan and 1.879 in puncha season. For traditional varieties the figures were 1.326 in viruppu, 1.607 in mundakan and 1.821 in puncha season.

Cost of cultivation of paddy showed little change with change in holding size and increase in gross income of family.

Cost of cultivation of banana in the region was Rs.34,554.95/ha. It also did not show much variation with the change in holding size and also income of family. Cost per bunch was Rs.10.06 and Rs.1.54 per kg at total cost excluding rental value of own land. The benefit cost ratio at total cost excluding rental value of land was 1.867.

The maintenance cost of coconut gardens was Rs.5184.86/ha but 42 per cent of it was only imputed rental value of own land. This also did not show much variation among holding groups and income groups. The benefit cost ratio for coconut

cultivation at total maintenance cost excluding rental value of land was 3.658 which shows very high net returns from this crop.

In the case of arecanut, the maintenance cost was Rs.11594.66/ha but here also around 32 per cent was accounted for by rental value of land. The benefit cost ratio at total cost excluding rental value of land was around 2.311.

The average expenditure on food per adult on sample farms was Rs.1193.86 per annum. The average total expenditure per adult unit was Rs.2114.56. The average family income of the households was Rs.16,641.92 and per capita income was Rs.2525.33. The per capita savings was Rs.622.55.

The infrastructure in the area was generally well developed. The erratic supply of irrigation water through Peechi water during mundakan season was the main problem for farmers in the lower reaches.

References

REFERENCES

Anand, O.P. 1960. Some aspects of optimum benefits from utilization of irrigation potential of Chambal Valley Project. Indian J. agric. Econ., 15(4): 19-32.

Bagi, F.S. 1981. Economics of irrigation in crop production in Haryana. Indian J. agric. Econ. 36(3): 15-26.

Bal, H.S., Rachpal Singh and Bal, H.K. 1980. Economics of milch animals and farm size analysis. Indian J. agric. Econ. 35(4): 145.

Balishter and Singh, B.K.1980. Economics of crop and livestock enterprises in Bichpuri block of Agra district of western U.P. Indian J. agric. Econ. 35(4): 155-156.

Chawla, J.S. 1975. Assessment of small farmers' expenditure on modern inputs in district Amritsar. A case study. Indian J. agric. Econ. 30(3): 244.

Chawla, J.S., Gill, S.S. and Sandhu, K.S. 1975. Income and expenditure pattern of small farmers in district Amritsar. A case study. Indian J. agric. Econ. 30(3): 254.

Dasgupta, H.K. 1961. Costs in relation to size of farms in Bhuvaneswar area. Indian J. agric. Econ. 16(4): 59-60.

Deole, C.D. and Ashturkar, B.W. 1972. Income and savings of selected holdings in agriculture under command area of Purna Project in Parbhani district. Indian J. agric. Econ. 27(4): 85.

Desai, B.M. 1973. Economics of resource use on sample farms of central Gujarat. Indian J. agric. Econ. 28(1):

Desai, B.M. 1977. Analysis of cropping pattern of farm families in Surat district. Indian J. agric. Econ. 33(1): 78.

Dubhashi, P.R. 1976. Ghataprabha and Malaprabha irrigation projects. A case study in Command Area Development. Role of Irrigation in the Development of India's Agriculture. Seminar series XIII, Indian Society of Agricultural Economics and Institute for Social and Economic change. 163.

Farm Information Bureau. 1981. Farm Guide. Department of Agriculture, Government of Kerala.

Garg, J.S. and Srivastava, H.L. 1972. Income, savings and investment in the context of modern farm technology. Indian J. agric. Econ. 27(4): 85.

*George, P.S. and Srivastava, U.K. 1975. Institutional finance for dairy development. Indian J. agric. Econ. 30(3): 90-96.

Government of Kerala. 1971. District Census hand book, Trichur. 32-37.

Jayaraman, T.K. 1979. Co-operative credit in irrigated agriculture. A case study of an irrigation project in Gujarat. N.C.A.E.R. 11(4): 32.

Jayaraman, T.K. 1980. Some Research Issues in Irrigated Agriculture under Major Irrigation Projects. National Seminar on Research perspectives in Agricultural Economics. CARDS, Tamil Nadu Agricultural University, Coimbatore.

Jhol, S.S. and Kapoor, T.R. 1977. Fundamentals of Farm Business Management. Kalyani Publishers, Delhi.

*Kahlon, A.S., Bal, H.S. and Singh, G. 1972. Savings and investment pattern of farm families in Punjab. Indian J. agric. Econ. 27(4): 19-29.

*Kahlon, A.S. et al. 1973. Studies in the economics of Farm Management in Ferozpur district, Punjab for the year 1967-68. Paper published by the Department of Agricultural Economics and Sociology, Punjab Agricultural University, Ludhiana, 168-176.

Kerala Agricultural University. 1981. Package of Practices Recommendations. Extension Division.

Khuspe, T.S. 1979. Constraints in utilization of canal irrigation water. Agricultural situation in India. Sept. 381.

*Lavania, G.S., Shukla, E.O. and Dixit, R.S. 1975. An economic analysis of milk production in Kashi Vidya Peeth Block, Varanasi district. Indian J. agric. Econ. 30(3): 147.

Mangala Bhanu. 1977. Project Report for Command Area Development (Malampuzha-Peechi-Chalakudy irrigation projects). Published by Department of Agriculture, Government of Kerala. 85-144.

Miglani, S.S., Singh, J.C. and Singh, J. 1972. Income distribution in relation to farm size and irrigation. Indian J. agric. Econ. 27(4): 85.

*Ministry of Agriculture. 1972. Report on the National Commission on Agriculture, Government of India.

Ministry of Agriculture. 1976. Report on the National Commission on Agriculture. Part V, Government of India.

*Ministry of Irrigation and Power. 1972. Report of the Irrigation Commission, Volume I, Government of India. p. 242.

Mishra, G.P. and Vivekananda, M. 1979. Impact of canal irrigation in Rural Areas (A case study of Bellary District). Impact of Irrigation Canal, Well and Tank. Himalayan Publishing House, Bombay.

Murthy, Y.K. 1976. Utilization of irrigation facilities. Role of irrigation in the Development of India's Agriculture. Seminar Series XIII. Indian Society of Agricultural Economics and Institute for Social and Economic change. 16-29.

Nadkarni, M.V., Rao, V.M., Kamble, N.D., Aziz, A., Charles, N.C., Rao, M.N., Mishra, G.P., Vivekananda, L., Dasgupta, K.K., Hemalatha Rao and Ghosh, P.K. 1979. Impact of irrigation (canal, well and tank irrigation) in Karnataka. Himalayan Publishing House, Bombay.

Naidu, M.K., Bathiah, B. and Phelix Edward. 1981. A note on farm size, cropping intensity and labour use in Indian agriculture. A study of Cuddapah district. Indian J. agric. Econ. 36(2): 54-58.

Nandal, D.S. 1972. Pattern of income, investment, expenditure and savings of selected demonstration farms in Haryana. Indian J. agric. Econ. 27(4): 11-19.

Palaniswamy and Rajagopalan, V. 1977. Pattern of employment of labour vis-a-vis size of the farm. Madras agric. J. 64(12): 803-806.

Pandey, H.K., Viswanath and Singh, R.P. 1972. Pattern of Income savings and investment in Agriculture in Eastern U.P. Indian J. agric. Econ. 27(4): 30-36.

*Pathak, M. and Desai, M. 1977. Development of Kadana Command Area - A Review. Arthavikas. 13(1): 14-50.

Patil, R.G., Suryawanshi, S.D. and Kapase, P.M. 1978. The Socio Economic Survey of Girna Irrigation Project Area in Jalgaon District (Maharashtra). Published by Department of Agricultural Economics, Mahatma Phulae Krishi Vidyapeeth, Rahuri.

Patil, R.G., Suryawanshi, S.D. and Kapase, P.M. 1980. An investigation into the Socio Economic conditions in Ghod Irrigation Project Area (Maharashtra). Published by Department of Agricultural Economics, Mahatma Phule Krishi Vidyapeeth, Rahuri.

Radhakrishnan, S.A. 1971. Optimum resource allocation for maximum farm income. Madras agric. J. 58(6): 465-474.

Radhakrishnan, V., Rajendran, D.V. and Damodaran Nair. 1981. Cost of cultivation and Economics of paddy in Kerala during 1978-79. Published by Department of Agricultural Economics, Kerala Agricultural University, Vellanikkara, Trichur.

Radhakrishnan, V., Rajendran, D.V. and Damodaran Nair. 1981. Cost of cultivation and Economics of paddy in Kerala during 1979-80. Published by Department of Agricultural Economics, Kerala Agricultural University, Vellanikkara, Trichur.

*Raghupathy, A. 1977. Coconut production. An economic evaluation. Unpublished M.Sc.(Ag) Thesis submitted to University of Agricultural Sciences, Hebbal.

Ram Iqbal Singh, Daulat Singh and Singh,J. 1975. Income distribution and its disposal in agriculture. Indian J. agric. Econ. 30(3): 58.

Rao, E.H. 1981. Production and Marketing of milk in Trichur district. Unpublished M.Sc.(Ag.) Thesis submitted to Kerala Agricultural University, Vellanikkara.

Rao, V.K.R.V. 1976. New challenges before Indian Agriculture. Role of Irrigation in the Development of India's Agriculture. Seminar Series XIII, Indian Society of Agricultural Economics and Institute for Social and Economic change, 129.

Rath, N. 1973. Regional variation in level and cost of living in rural India in 1961-62. Arthavignana. 15(4): 337-352.

Rathore, B.S., Dixit, B.M. and Bariwal, M.L. 1975. Economy of small farms in Udaipur district of Rajasthan. Indian J. agric. Econ. 30(3): 236.

Reserve Bank of India. 1981. Reserve Bank of India Annual Report. pp. 46.

Sen, L.K. 1976. Role of irrigation in Integrated Area Development Planning. In Role of Irrigation in the Development of India's Agriculture. Seminar Series XIII. Indian Society of Agricultural Economics and Institute for Social and Economic change.

Sidhu, D.S., Tirath Singh, Inder Sain, Bal, H.S., Joshi, A.S. and Sharma. 1980. An analysis of Income and Expenditure pattern of Punjab farmers in 1978-79. Published by Department of Economics and Sociology, Punjab Agricultural University, Ludhiana.

*Singh, B. 1966. Cost of cultivation in relation to size of holding. Indian J. agric. Econ. 21(3): 71.

*Singh, B.P. 1974. Agricultural Development: Investment and Regional disparities. The Economic Times. October 17, 1974.

*Singh, G.N. and Srivastava. 1975. Cropping pattern, employment and resource use of small farmers. A case study. Indian J. agric. Econ. 30(3): 238.

Singh, D.S. and Yadav, 1975. A study of the income, investment and cropping pattern of small farmers in Kalyanpur Block, Kanpur district, U.P. A case study. Indian J. agric. Econ. 30(3): 265.

Singh, G.N., Singh, T.R., Singh, R.I. and Singh, D.S. 1975. An enquiry into cropping, employment and income pattern of small farmers in district Meerut of U.P. Indian J. agric. Econ. 30(3): 264.

Singh, I.J. 1977. Elements of Farm Management Economics. Affiliated East-West Press, New Delhi.

Singh, K.B. 1977-78. Better yields through water management. Intensive Agriculture. 15(10-11): 9.

Singh, R.K. 1980. Income and employment potential of dairy enterprise on mixed farms. Indian J. agric. Econ. 35(4): 165.

Singh, S.D., Gupta, B.K. and Misra, P.D. 1980. Economics of livestock production in relation to its contribution to the gross farm income and employment in Faridabad district, U.P. Indian J. agric. Econ. 35(4): 161.

Sisodia, J.S. 1977. Economic evaluation of Chambal irrigation project in M.P. Indian J. agric. Econ. 33(1): 263.

Suryawanshi, S.D. 1980. Credit requirement availability and its gap in the farms in the Girna Command Area of Maharashtra. Financing Agriculture. Agricultural Finance Corporation Limited, Bombay. 12(2): 12.

Suryawanshi, S.D., Kapase, P.M., Patil, R.S. and Patil, S.J. 1980. Economics of Investment in Girna Command Area of Maharashtra. Agricultural Situation in India. Sept. 1980: 467.

Swaminathan, M. and Bhagavan, R.K. 1972. Our Food. Ganesh and Co., Madras, VIIth Edition, 197.

Wade, R. 1975. Water to the fields. India's changing strategy. South Asian Review. 8(4): 301-321.

*Originals not seen

Appendices

APPENDIX I

INTERVIEW SCHEDULE

I. Identification

1. Name and address
2. Religion
3. Ward

II. Family details

Sl. No.	Sex	Age	Education	Occupation		Annual income		
				Main	Subsi-diary	Main	Subsi-diary	Others

III. Membership in Co-operative Societies

Sl. No.	Member	Name of the society	Year	No. of shares	Value of share	Total amount

---

IV. Land holding

FR No	Dis-trance	Total area	Area under build-ing	Area irri-gated	Source of irri-gation	Type of tenure	Present value	Crop grown	Rent

---

V. Crops grown (Paddy)

Sea-son	Area	Variety	Irri/ rainfed	Yield (kg)		Qty.uti-lised(kg)		Qty.sold		Rate	
				MP	BP	MP	BP	MP	BP	MP	BP

Other crops

Crop	Fg. No.	Area	No. of plants/ palms	No. of palms yielding	Total yield MP	Total yield BP	Value MP	Value BP	Remarks
Coconut									
Arecanut									
Cashew									
Banana									
Vegetables									
Pepper									

VI. Buildings and other structures

Sl No.	Particulars	Specification floor area	Year of construction	Value of construction	Expected life (yrs)	Annual maintenance cost	Present value	Remarks
1.	Residential buildings							
2.	Farm shed							
3.	Cattle shed							
4.	Store							
5.	Water tank							
6.	Pond							
7.	Compound wall							

VII. Farm implements and Machinery

Item	Specification	No.	Year of purchase	Purchase value	Expected life	Annual maintenance cost (Rs)	Remarks
1. Implements							
Country plough							
Improved plough							
Levelling plank							

2. Hand tools
   Spade
   Pickaxe
   Sickle
3. Machinery
   Tractor
   Power tiller
4. Transport
   Bullock carts
   Hand carts
5. Plant protection
   Hand sprayers
   Power sprayers
   Dusters
6. Dairy equipments
   Feed tray
   Milk cans
7. Temporary
   Baskets
   Bamboo mats
   Muram
   Coir ropes

VIII. Irrigation structure & equipment

Sl. No.	Item	No.	Fragment No.	Specification	Year of construction	Value at construction/ purchase (Rs)	Annual maintenance cost (Rs)	Remarks
1.	Well							
2.	Tube well							
3.	Pump set							
4.	Pump shed							
5.	Pond							
6.	Channels							

IX. Operational costs

Sl. No.	Item	No.of hrs/ day	No.of days/ week	No.of month in a year	Fuel cost	Maintenance cost/yr		Remarks
						Major repairs last/year	Annual maintenance cost	
1.	Tractor							
2.	Power tiller							
3.	Pumpset							

X. Income from renting out

Sl. No.	Item	Hours rented out	Rate/hour (Rs)	Total rent (Rs)	Remarks
1.	Tractor				
2.	Power tiller				
3.	Pumpset				
4.	Sprayer				
5.	Drought animals				
6.	Bullock cart				
7.	Hand cart				

XI. Livestock

Description	Breed	Home bred/ purchased	Year of birth/ Purchase age	Price/ market value	Present worth	Remarks
1. Milch Animals						
Buffaloes						
Cows						
2. Young stock						
Heifers						
Male						
Female						
Buffaloes						
Male						
Female						
3. Drought animals						
4. Goats						
5. Poultry						

XII. Maintenance charges of livestock/day/animal

Type of animal	No. of animals	Green fodder				Dry fodder				Concentrates				Mineral mixture				Veterinary expenses	Remarks
		Qty.		Value		Qty.		Value		Qty		Value		Qty.		Value			
		Home produced	Purchased	H.P.	Pur.	HP	Pur	HP	Pur.	HP	Pur.	HP	Pur						

XIII. Status of milch animals

Milch animals	Present status	No. of completed lactations	Date of previous calving	Date of present calving	Total lactation period	Milk yield (in litres) 1st 1/3	2nd 1/3	3rd 1/3	Milk consumed (in ltrs	Milk sold Qty (l)	Value (Rs.)	Converted to other products Used	So-Vald	Value	Present worth of animal	Remarks

XIV. Income from birds

Sl.No.	Type	No. of birds laying eggs	Total No. of eggs	No. of eggs consumed	No.of eggs sold	Value

XV. Income from dung

Approximate quantity available	Used within the farm	Quantity sold	Total amount

XVI. Household articles

Sl. No.	Item	Year of pur-chase	Purchase price	Maintenance cost	Present worth	Remarks
1.	Radio					
2.	Sewing machine					
3.	Bicycle					
4.	Motor cycle					
5.	Scooter					
6.	Motor car					
7.	Fan					
8.	Pressure cooker					
9.	Electric iron					
10.	Almirah					
11.	Boxes					
12.	Furniture					
13.	Utensils					
14.						

XVII. Sources of power

Sl. No.	Purpose	Device	Material	Expense/month	Remarks
1.	Cooking				
2.	Lighting				
3.	Irrigation				
4.	Transport of farm product				

XVIII. Marketing of Farm produce

Sl. No.	Item	Quantity sold	To whom sold	Where sold	Distance to the nearest market	Mode of transport	Marketing problems if any

XIX. Consumption pattern of the family

Sl. No.	Particulars	Quantity in kg per				Rate/ unit	Total amount/ year	Remarks
		Day	Week	Month	Year			
A.	Food							
1.	Rice							
2.	Tapioca							
3.	Wheat							
4.	Pulses							
5.	Sugars							
6.	Oils							
7.	Milk							
8.	Meat							
9.	Fish							
10.	Egg							
11.	Vegetables							
B.	Clothing & Footwear							
C.	Rent							
D.	Education							
E.	Fuel & lighting							
F.	Medicine							
G.	Travel							
H.	Recreation							
I.	Beverages							
J.	Taxes							
K.	Tobacco							
L.	Liquor							
M.	Others, if any							

XX. Loans and savings

i. Loans obtained

Sl. No.	Agency	Date of borrowing	Purpose	Amount	Interest rate	Amount out-standing	Amount due

ii. Savings like loans advanced, jewellary, shares, cash in bank, cash in hand, deposits etc.

Sl.No.	Form of saving	Year	Present value	Remarks

XXI. Savings and investments

A. Acquisition of real estate, buildings, vehicles

Sl. No.	Month	Acquisition/ improvement	Acquisition/ improvement cost	Remarks

XXII. Disposal

Sl.No.	Item	Year	Disposal value	Remarks

XXIII. Input and output use during 1981-82

Name of crop	Variety	Area (in cents) Irrigated	Area (in cents) Unirrigated	No. of plants or trees for annual or perennial	Bullock pairs No.	Bullock pairs Hrs.	Bullock pairs days	Bullock pairs Amt.	Preparatory cultivation: Men Family No.	Men Family Days	Men Family Amt.	Men Hired No.	Men Hired Days	Men Hired Amt.	Women Family No.	Women Family Days	Women Family Amt.	Women Hired No.	Women Hired days	Women Hired Amt.

1. Seasonal
2. Annual
3. Perennial

XXIV.

Name	Qty./ day/ Amt.	Value	Seeds and sowing: Men Family No./ day/ Amt.	Men Family No. day	Men Family Amt.	Men Hired No. day	Men Hired Amt.	Women Family No. day	Women Family Amt.	Women Hired No. day	Women Hired Amt.	Type of operation	After cultivation operations: Men Family No.	Men Family day	Men Family Amt.	Men Hired No. day	Men Hired Amt.	Women Family No. day	Women Family Amt.	Women Hired No. day	Women Hired Amt.

1. Seasonal
2. Annual
3. Perennial

Name of crop	Name of chemical	Qty	Value	Plant protection: Labour for application: Men: Family	Plant protection: Labour for application: Men: Hired	Plant protection: Labour for application: Women: Family	Plant protection: Labour for application: Women: Hired	Irrigation: Men: Family	Irrigation: Men: Hired	Irrigation: Women: Family	Irrigation: Women: Hired
				No./ day/ Amt.	No./ day/ amt/	No./ day/ amt.	No./ day/ amt	No./ day/ amt	No./ day/ amt.	No./ day/ amt.	No./ day/ amt.
1. Seasonal											
2. Annual											
3. Perennial											

XXV. Fertilizers and mannures and their application

Name of crop	Fertilizers: Name	Fertilizers: Qty.	Fertilizers: Value	Manures: Name	Manures: Qty	Manures: Value	Application: Men: Family: No.	Application: Men: Family: days	Application: Men: Family: Amt.	Application: Men: Hired: No.	Application: Men: Hired: days	Application: Men: Hired: Amt.	Application: Women: Family: No.	Application: Women: Family: days	Application: Women: Family: Amt.	Application: Women: Hired: No.	Application: Women: Hired: days	Application: Women: Hired: Amt.
1. Seasonal																		
2. Annual																		
3. Perennial																		

Sl. No.	Name of crop	Harvesting				Kind payments		Yield			
		Men		Women		Quantity (kg)	Value (Rs)	Main product		By products	
		Family No./ day/ amt.	Hired No./ day/ amt.	Family No./ day/ amt.	Hired No./ day/ amt.			Qty. (kg)	Value (Rs)	Qty. (kg)	Value (Rs)
1. Seasonal											
2. Annual											
3. Perennial											

XXVI. Constraints in production

Sl. No.	Description	Rating in a scale according to magnitude of the problems
1	Availability of fertilizers	
2	High price of fertilizers	
3	Lack of capital	
4	Non-availability of credit	
5	Lack of irrigation facilities	
6	Non-availability of high yielding seeds	
7	Lack of marketing facilities	
8	Lack of communication facilities	
9	Low price of farm produce	
10	Small size of farms	
11	Non-availability of labour	

APPENDIX II

Table 1. Per hectare labour utilization for viruppu paddy in holding size groups (figures in hours)

Particulars	Holding size groups				
	Smallest	Small	Medium	Large	Average
HYV Paddy					
Family labour:					
Male	294.50	164.30	141.01	111.26	177.77
Female	36.59	19.90	16.17	2.36	18.76
Hired labour:					
Male	43.90	107.17	112.27	133.17	99.13
Female	600.10	430.21	449.09	599.67	519.77
Bullock labour	58.50	73.50	43.11	61.00	59.03
Tractor	2.24	-	3.65	2.04	1.98
Total labour:					
Male	338.40	271.47	253.28	244.43	276.90
Female	636.69	450.11	465.26	602.03	538.52
Traditional varieties					
Family labour:					
Male	236.57	159.47	122.24	99.13	154.35
Female	116.96	11.15	9.43	10.63	37.04
Hired labour:					
Male	94.06	95.18	128.64	148.69	116.64
Female	449.43	574.69	534.41	544.30	525.71
Bullock labour	40.90	28.40	53.88	52.41	43.90
Tractor	3.47	5.72	3.07	2.74	3.75
Total labour					
Male	330.63	254.65	250.88	247.82	271.00
Female	566.39	585.84	543.84	554.93	562.74

Table 2. Per hectare labour utilization for viruppu paddy in income groups (figures in hours)

Particulars	Income groups				
	Lowest	Lower	Middle	High	Average
HYV paddy					
Family labour:					
Male	321.50	197.80	121.04	70.73	177.77
Female	42.00	18.00	10.00	5.02	18.76
Hired labour:					
Male	24.50	121.40	123.27	127.34	99.13
Female	478.50	501.20	514.10	585.27	519.77
Bullock labour	76.00	64.20	48.60	47.31	59.03
Tractor	-	0.38	3.80	3.74	1.98
Total labour:					
Male	346.00	319.20	244.31	198.07	276.90
Female	520.50	519.20	524.10	590.29	538.52
Traditional varieties					
Family labour:					
Male	249.30	178.25	110.74	79.12	154.35
Female	110.80	18.35	12.30	6.72	37.04
Hired labour:					
Male	83.15	94.31	110.70	178.41	116.64
Female	481.30	522.10	543.40	556.03	525.71
Bullock labour	54.10	49.10	34.30	38.09	43.89
Tractor	2.21	2.79	5.21	4.79	3.75
Total labour:					
Male	332.45	272.56	221.44	257.53	271.00
Female	592.10	540.45	555.70	562.75	562.75

Table 3. Per hectare utilization of labour for mundakan paddy in holding size groups (figures in hours)

Particulars	Holding size groups				
	Smallest	Small	Medium	Large	Average
HYV paddy					
Family labour:					
Male	287.60	143.00	137.46	138.80	176.72
Female	19.12	5.20	31.50	1.90	14.43
Hired labour:					
Male	47.80	58.93	27.21	91.51	56.36
Female	522.70	293.80	309.29	410.73	384.13
Bullock labour	63.70	34.67	34.30	47.05	44.93
Tractor	-	4.25	4.28	2.65	2.79
Total labour:					
Male	335.40	201.93	164.67	230.31	233.08
Female	541.82	299.00	340.79	412.63	398.56
Traditional varieties					
Family labour:					
Male	219.00	145.03	105.73	77.65	136.85
Female	80.80	18.81	9.00	6.00	28.65
Hired labour:					
Male	43.14	65.71	85.55	111.40	76.45
Female	375.58	377.89	350.84	503.07	401.85
Bullock labour	37.22	17.64	24.15	26.86	26.47
Tractor	3.15	4.85	4.26	4.11	4.09
Total labour:					
Male	262.14	210.74	191.28	189.05	213.30
Female	456.38	396.70	359.84	509.07	430.50

Table 4. Per hectare utilization of labour for mundakan paddy in income groups (Figures in hours)

Particulars	Income groups				
	Lowest	Lower	Middle	High	Average
HYV Paddy					
Family labour:					
Male	301.00	156.20	134.50	115.16	176.72
Female	31.00	6.40	13.00	7.32	14.43
Hired labour:					
Male	29.40	43.20	45.40	107.45	56.36
Female	489.20	314.14	287.13	446.05	384.13
Bullock labour	57.40	33.70	37.40	51.26	44.93
Tractor	0.75	4.50	4.31	1.62	2.79
Total labour:					
Male	330.40	199.40	179.90	222.61	233.08
Female	520.20	320.54	300.13	453.37	398.56
Traditional varieties					
Family labour:					
Male	258.00	129.20	107.21	53.00	136.85
Female	76.40	21.30	10.00	6.91	28.65
Hired labour:					
Male	39.14	63.70	89.40	113.56	76.45
Female	325.42	401.30	429.40	451.20	401.85
Bullock labour	41.21	23.74	18.75	22.17	26.47
Tractor	2.78	4.27	4.80	4.52	4.09
Total labour:					
Male	297.14	192.90	196.61	166.56	213.30
Female	401.82	422.60	439.40	458.11	430.50

Table 5. Per hectare utilization of labour for puncha paddy in holding size groups (Figures in hours)

Particulars	Holding size groups				
	Smallest	Small	Medium	Large	Average
HYV Paddy					
Family labour:					
Male	189.40	143.84	115.27	169.80	154.58
Female	55.70	36.30	9.90	74.10	44.00
Hired labour:					
Male	44.60	56.70	23.00	86.45	52.69
Female	230.29	235.38	316.16	222.30	251.03
Bullock labour	44.57	29.06	-	49.40	30.76
Tractor	2.54	3.69	6.85	2.01	3.78
Total labour:					
Male	234.00	200.54	138.27	256.25	207.27
Female	285.99	271.68	326.06	296.40	295.03
Traditional varieties					
Family labour:					
Male	197.60	98.10	89.24	58.17	110.78
Female	173.50	23.30	23.76	5.65	56.55
Hired labour:					
Male	95.63	68.61	47.51	96.34	77.02
Female	307.17	280.62	277.76	329.80	298.84
Bullock labour	55.73	10.98	4.90	14.95	21.64
Tractor	0.65	5.10	5.59	4.55	3.97
Total labour:					
Male	293.23	166.71	136.75	154.51	187.80
Female	480.67	303.92	301.52	335.45	355.39

Table 6. Per hectare utilization of labour for puncha paddy in income groups (Figures in hours)

Particulars	Income groups				
	Lowest	Lower	Middle	High	Average
HYV Paddy					
Family labour:					
Male	217.35	174.25	130.14	96.57	154.58
Female	58.40	52.40	42.20	23.00	44.00
Hired labour:					
Male	34.30	37.30	51.20	87.85	52.69
Female	210.34	225.20	264.40	304.19	251.03
Bullock labour	34.24	20.41	28.34	40.04	30.76
Tractor	3.79	4.82	4.10	2.38	3.77
Total labour:					
Male	251.65	211.65	181.34	184.42	207.27
Female	268.74	277.60	306.60	327.19	295.03
Traditional varieties					
Family labour:					
Male	214.70	101.30	74.20	52.91	110.78
Female	145.70	49.24	18.75	12.52	56.55
Hired labour:					
Male	64.30	69.20	71.20	103.39	77.02
Female	274.30	289.40	294.20	337.45	298.84
Bullock labour	44.20	17.25	10.14	14.97	21.64
Tractor	2.71	4.16	4.67	4.35	3.97
Total labour:					
Male	279.00	170.50	145.40	156.30	187.80
Female	420.00	338.64	312.95	349.97	355.39

Table 7. Input-wise cost of cultivation of HYV paddy per hectare in viruppu season - holding size groups) (figures in rupees)

Particulafs	Smallest	Small	Medium	Large	Average
Hired human labour	1794.35 (29.13)	1755.31 (31.89)	1658.01 (30.15)	1910.71 (34.08)	1779.60 (31.27)
Bullock/Tractor	512.30 (8.32)	326.60 (5.94)	372.74 (6.78)	463.94 (8.27)	418.90 (7.36)
Seeds & seedlings	469.83 (7.63)	412.21 (7.49)	425.60 (7.74)	417.40 (7.44)	431.26 (7.58)
Manures	375.06 (6.09)	244.94 (4.45)	327.84 (5.96)	431.70 (7.70)	344.89 (6.06)
Fertilizers	652.61 (10.59)	612.65 (11.13)	528.63 (9.61)	423.11 (7.55)	554.25 (9.74)
Pesticides	45.74 (0.74)	29.86 (0.54)	36.16 (0.66)	43.39 (0.77)	38.79 (0.68)
Miscellaneous	25.98 (0.42)	35.98 (0.66)	60.36 (1.10)	40.68 (0.73)	40.75 (0.71)
Depreciation on implements	130.23 (2.11)	115.99 (2.11)	98.23 (1.79)	62.42 (1.11)	101.72 (1.78)
Interest on working capital	160.24 (2.60)	141.34 (2.57)	140.30 (2.55)	151.73 (2.71)	148.40 (2.61)
Cost A	4166.34 (67.63)	3674.88 (66.78)	3647.87 (66.34)	3945.08 (70.36)	3858.54 (67.79)
Rental value of own land	1419.79 (23.05)	1322.52 (24.04)	1407.90 (25.61)	1335.53 (23.82)	1371.44 (24.09)
Interest on fixed capital	72.60 (1.18)	67.32 (1.22)	60.17 (1.09)	36.35 (0.65)	59.11 (1.04)
Cost B	5658.73 (91.86)	5064.72 (92.04)	5115.94 (93.04)	5316.96 (94.83)	5289.09 (92.92)
Family labour wages	501.52 (9.14)	438.12 (7.96)	382.62 (6.96)	289.80 (5.17)	403.02 (7.08)
Cost C	6160.25 (100.00)	5502.84 (100.00)	5498.56 (100.00)	5606.76 (100.00)	5692.11 (100.00)

Figures in parenthesis are percentages to total

Table 8. Operationwise per hectare cost of cultivation of HYV paddy in viruppu season - holding size groups (figures in rupees)

Operation	Smallest	Small	Medium	Large	Average
Preparatory cultivation	811.74 (13.18)	825.72 (15.01)	670.03 (12.19)	787.18 (14.04)	773.67 (13.59)
Seeds & sowing	852.87 (13.84)	743.93 (13.52)	716.62 (13.03)	813.05 (14.50)	781.62 (13.74)
Weeding	406.81 (6.60)	252.11 (4.58)	242.50 (4.41)	372.00 (6.63)	318.36 (5.59)
Plant protection	64.04 (1.04)	52.80 (0.95)	70.27 (1.28)	84.20 (1.50)	67.83 (1.19)
Manures and application	448.25 (7.28)	298.67 (5.42)	410.90 (7.47)	504.89 (9.01)	415.68 (7.31)
Fertilizers and application	681.41 (11.06)	637.53 (11.59)	548.84 (9.98)	441.48 (7.87)	577.32 (10.14)
Irrigation and drainage	256.15 (4.16)	224.52 (4.08)	278.48 (5.06)	200.81 (3.58)	239.99 (4.22)
Harvesting etc.	830.14 (13.48)	784.41 (14.25)	793.96 (14.44)	776.44 (13.85)	796.24 (13.991
Miscellaneous (	25.98 (0.42)	35.98 (0.66)	60.36 (1.10)	40.68 (0.73)	40.75 (0.71)
Depreciation on implements	130.23 (2.11)	115.99 (2.11)	98.23 (1.79)	62.42 (1.11)	101.72 (1.78)
Interest on working capital	160.24 (2.60)	141.34 (2.57)	140.30 (2.55)	151.73 (2.71)	148.40 (2.61)
Less of family wages	501.52	438.12	382.62	289.80	403.02
Cost A	4166.34 (67.63)	3674.88 (66.78)	3647.87 (66.34)	3945.08 (70.36)	3858.54 (67.79)
Rental value of own land	1419.79 (23.05)	1322.52 (24.04)	1407.90 (25.61)	1335.53 (23.82)	1371.44 (24.09)
Interest on fixed capital	72.60 (1.18)	67.32 (1.22)	60.17 (1.09)	36.35 (0.65)	59.11 (1.04)
Cost B	5658.73 (91.86)	5064.72 (92.04)	5115.94 (93.04)	5316.96 (94.83)	5289.09 (92.92)
Family labour wages	501.52 (8.14)	438.12 (7.96)	382.62 (6.96)	289.80 (5.17)	403.02 (7.08)
Cost C	6160.25 (100.00)	5502.84 (100.00)	5498.56 (100.00)	5606.76 (100.00)	5692.11 (100.00)

Figures in parenthesis are percentages to total

Table 9. Inputwise per hectare cost of cultivation of HYV paddy in viruppu season - income groups (figures in rupees)

Particulars	Lowest	Lower	Middle	High	Average
Hired human labour	1599.74 (27.70)	1705.23 (30.77)	1879.49 (32.97)	1933.92 (33.63)	1779.60 (31.27)
Bullock labour/ Tractor	378.72 (6.56)	350.51 (6.33)	437.16 (7.67)	509.19 (8.85)	418.90 (7.36)
Seeds and seedlings	444.60 (7.70)	426.89 (7.70)	439.36 (7.71)	414.19 (7.20)	431.26 (7.58)
Manures	345.80 (5.99)	242.06 (4.37)	407.90 (7.15)	383.78 (6.67)	344.89 (6.06)
Fertilizers	648.79 (11.23)	606.78 (10.95)	457.93 (8.03)	503.50 (8.75)	554.25 (9.74)
Pesticides	28.88 (0.50)	39.05 (0.70)	41.77 (0.73)	45.45 (0.79)	38.79 (0.68)
Miscellaneous	37.86 (0.66)	40.48 (0.73)	39.29 (0.68)	45.37 (0.79)	40.75 (0.71)
Depreciation on implements	116.02 (2.00)	101.60 (1.84)	95.58 (1.68)	93.67 (1.64)	101.72 (1.78)
Interest on working capital	144.02 (2.49)	140.50 (2.54)	151.94 (2.67)	157.16 (2.73)	148.40 (2.61)
Cost A	3744.43 (64.83)	3653.10 (65.93)	3950.42 (69.29)	4086.23 (71.05)	3858.54 (67.79)
Rental value of own land	1396.14 (24.17)	1393.55 (25.15)	1328.76 (23.31)	1367.28 (23.78)	1371.43 (24.09)
Interest on fixed capital	56.99 (0.99)	55.21 (1.00)	63.70 (1.12)	60.54 (1.05)	59.11 (1.04)
Cost B	5197.56 (89.99)	5101.86 (92.08)	5342.88 (93.72)	5514.05 (95.88)	5289.08 (92.92)
Family labour wages	577.98 (10.01)	438.70 (7.92)	358.24 (6.28)	237.12 (4.12)	403.02 (7.08)
Cost C	5775.54 (100.00)	5540.56 (100.00)	5701.12 (100.00)	5751.17 (100.00)	5692.10 (100.00)

Figures in parenthesis are percentages to total

Table 10. Operationwise per hectare cost of cultivation of HYV paddy in viruppu season - income groups (Figures in Rs)

Particulars	Lowest	Lower	Middle	High	Average
Preparatory cultivation	826.32 (14.31)	777.40 (14.03)	826.01 (14.49)	673.43 (11.71)	773.67 (13.59)
Seeds and sowing	726.18 (12.57)	708.54 (12.79)	865.36 15.18)	826.39 (14.37)	781.62 (13.74)
Weeding	237.12 (4.11)	281.65 (5.08)	344.26 (6.04)	410.39 (7.14)	318.36 (5.59)
Plant protection	50.58 (0.87)	69.30 (1.25)	73.46 (1.28)	77.97 (1.34)	67.83 (1.19)
Manure and application	431.43 (7.47)	301.46 (5.44)	471.18 (8.26)	458.64 (7.97)	415.68 (7.31)
Fertilizer and application	678.43 (11.75)	629.05 (11.35)	481.18 (8.44)	520.60 (9.05)	577.32 (10.14)
Drainage and irrigation	247.00 (4.28)	242.06 (4.37)	192.73 (3.38)	269.70 (4.69)	239.99 (4.22)
Harvesting etc.	827.45 (14.33)	799.76 (14.43)	767.67 (13.47)	790.07 (13.74)	796.24 (13.99)
Miscellaneous	37.86 (0.66)	40.48 (0.73)	39.29 (0.68)	45.37 (0.79)	40.75 (0.71)
Depreciation on implements	116.02 (2.00)	101.60 (1.84)	95.58 (1.68)	93.67 (1.64)	101.72 (1.78)
Interest on working capital	144.02 (2.49)	140.50 (2.54)	151.94 (2.67)	157.16 (2.73)	148.40 (2.61)
Less of family wages	577.98	438.70	358.24	237.12	403.02
Cost A	3744.43 (64.83)	3653.10 (65.93)	3950.42 (69.29)	4086.23 (71.08)	3858.54 (67.79)
Rental value of own land	1396.14 (24.17)	1393.55 (25.15)	1328.76 (23.31)	1367.28 (23.78)	1371.43 (24.09)
Interest on fixed capital	56.99 (0.99)	55.21 (1.00)	63.70 (1.12)	60.54 (1.05)	59.11 (1.04)
Cost B	5197.56 (89.99)	5101.86 (92.08)	5342.88 (93.72)	5514.05 (95.88)	5289.08 (92.92)
Imputed family labour wages	577.98 (10.01)	438.70 (7.92)	358.24 (6.28)	237.12 (4.12)	403.02 (7.08)
Cost C	5775.54 (100.00)	5540.56 (100.00)	5701.12 (100.00)	5751.17 (100.00)	5692.10 (100.00)

Figures in parenthesis are percentages to total

Table 11. Per hectare production and income at different costs of HYV paddy in viruppu season - Holding size groups (Figures in Rs)

Particulars	Smallest	Small	Medium	Large	Average
Quantity of grain (kg)	3400.70	3294.60	3218.09	3157.57	3267.74
Quantity of byproduct (bundles)	1425.00	1540.00	1750.00	1620.00	1583.75
Value of grain(Rs)	5273.95	4672.60	4889.50	4654.64	4873.42
Value of Byproduct (Rs)	1425.00	1540.00	1750.00	1620.00	1583.75
Gross value(Rs)	6698.95	6212.60	6639.50	6274.64	6457.17
Farm business income	2532.61	2537.72	2964.63	2329.56	2598.63
Family labour income	1040.22	1147.88	1523.56	957.68	1168.08
Net income	538.70	709.76	1140.94	667.88	765.07
Benefit cost ratio at Cost A	1.61	1.69	1.81	1.59	1.67
Cost B	1.18	1.23	1.30	1.18	1.22
Cost C	1.09	1.13	1.21	1.12	1.13
Cost/quintal of grain at cost C(Rs)	139.24	120.28	116.48	126.26	125.72

Table 12. Per hectare yield and income at different costs from HYV paddy in viruppu season - income groups

Particulars	Lowest	Lower	Middle	High	Average
Quantity of grain (kg)	3210.25	3386.53	3146.18	3328.00	3267.74
Quantity of byproduct (bundles)	1565.00	1615.00	1590.00	1565.00	1583.75
Value of grain (Rs)	5015.70	4952.77	4653.80	4871.42	4873.42
Value of byproduct (Rs)	1565.00	1615.00	1590.00	1565.00	1583.75
Gross value (Rs)	6580.70	6567.77	6243.80	6436.42	6457.17
Farm business income (Rs)	2836.27	2914.67	2293.38	2350.19	2598.63
Family labour income (Rs)	1383.14	1465.91	900.92	922.37	1168.09
Net income (Rs)	805.16	1027.21	542.68	685.25	765.07
Benefit cost ratio at Cost A	1.76	1.80	1.58	1.58	1.67
Cost B	1.27	1.29	1.17	1.17	1.22
Cost C	1.14	1.19	1.10	1.12	1.13
Cost per quintal of grain at Cost C (Rs)	131.16	115.92	130.67	125.79	125.72

Table 13. Inputwise cost of cultivation of TV paddy per hectare in viruppu season - holding size groups (Figures in Rs)

Particulars	Smallest	Small	Medium	Large	Average
Hired human labour	1491.78 (27.07)	1519.48 (29.52)	1683.29 (32.92)	1624.55 (31.97)	1579.78 (30.30)
Bullock labour/ Tractor	533.89 (9.69)	516.19 (10.03)	447.44 (8.75)	448.92 (8.84)	486.61 (9.33)
Seeds and seedlings	501.17 (9.09)	443.25 (8.61)	395.49 (7.74)	423.72 (8.34)	440.91 (8.46)
Manures	318.96 (5.79)	296.96 (5.77)	331.69 (6.49)	359.60 (7.08)	326.80 (6.27)
Fertilizers	429.80 (7.80)	446.50 (8.68)	423.23 (8.28)	460.90 (9.07)	440.11 (8.44)
Pesticides	21.19 (0.38)	29.46 (0.58)	34.18 (0.69)	35.54 (0.70)	30.09 (0.58)
Miscellaneous	37.46 (0.68)	46.83 (0.91)	41.66 (0.81)	46.01 (0.90)	42.99 (0.83)
Depreciation on implements	130.24 (2.36)	115.99 (2.25)	98.23 (1.92)	62.42 (1.23)	101.72 (1.95)
Interest on working capital	138.58 (2.51)	136.59 (2.65)	138.21 (2.70)	138.47 (2.73)	137.96 (2.65)
Cost A	3603.07 (65.37)	3551.25 (69.00)	3593.42 (70.29)	3600.13 (70.86)	3586.97 (68.81)
Rental value of own land	1112.79 (20.19)	1113.82 (21.64)	1138.13 (22.26)	1164.70 (22.93)	1132.36 (21.72)
Interest on fixed capital	72.60 (1.32)	67.32 (1.31)	60.17 (1.18)	36.35 (0.72)	59.11 (1.14)
Cost B	4788.46 (86.88)	4732.39 (91.95)	4791.72 (93.73)	4801.18 (94.51)	4778.44 (91.67)
Imputed family labour wages	723.41 (13.12)	414.54 (8.05)	320.77 (6.27)	279.11 (5.49)	434.46 (8.33)
Cost C	5511.87 (100.00)	5146.93 (100.00)	5112.49 (100.00)	5080.29 (100.00)	5212.90 (100.00)

Figures in parenthesis are percentages to total

TV = Traditional variety

Table 14. Operationwise cost of cultivation per hectare of TV paddy in viruppu season - holding size groups (Figures in Rs)

Particulars	Smallest	Small	Medium	Large	Average
Preparatory cultivation	935.88 (16.98)	752.55 (14.62)	776.69 (15.19)	748.23 (14.73)	803.34 (15.41)
Seeds and sowing	873.78 (15.85)	810.42 (15.75)	772.31 (15.11)	753.37 (14.83)	802.47 (15.39)
Weeding	325.52 (5.91)	326.96 (6.35)	296.44 (5.80)	272.36 (5.36)	305.32 (5.86)
Plant protection	42.87 (0.78)	58.90 (1.15)	70.91 (1.39)	77.78 (1.53)	62.62 (1.20)
Manures and application	410.40 (7.45)	363.33 (7.06)	404.01 (7.90)	427.26 (8.41)	401.25 (7.70)
Fertilizers and application	455.54 (8.26)	472.60 (9.19)	441.61 (8.65)	483.30 (9.51)	463.26 (8.88)
Irrigation and drainage	337.59 (6.12)	274.55 (5.33)	245.61 (4.80)	227.21 (4.47)	271.24 (5.20)
Harvesting etc.	638.62 (11.59)	607.07 (11.79)	628.51 (12.29)	642.83 (12.65)	629.26 (12.07)
Miscellaneous	37.46 (0.68)	46.83 (0.91)	41.66 (0.81)	46.01 (0.90)	42.99 (0.83)
Depreciation on implements	130.24 (2.36)	115.99 (2.25)	98.23 (1.92)	62.42 (1.23)	101.72 (1.95)
Interest on working capital	138.58 (2.51)	136.59 (2.65)	138.21 (2.70)	138.47 (2.73)	137.96 (2.65)
Less family wages	723.41	414.54	320.77	279.11	434.46
Cost A	3603.07 (65.37)	3551.25 (69.00)	3593.42 (70.29)	3600.13 (70.86)	3586.97 (68.81)
Rental value of own land	1112.79 (20.19)	1113.82 (21.64)	1138.13 (22.26)	1164.70 (22.93)	1132.36 (21.72)
Interest on fixed capital	72.60 (1.32)	67.32 (1.31)	60.17 (1.18)	36.35 (0.72)	59.11 (1.14)
Cost B	4788.46 (86.88)	4732.39 (91.95)	4791.72 (93.73)	4801.18 (94.51)	4778.44 (91.67)
Imputed family labour wages	723.41 (13.12)	414.54 (8.05)	320.77 (6.27)	279.11 (5.49)	434.46 (8.33)
Cost C	5511.87 (100.00)	5146.93 (100.00)	5112.49 (100.00)	5080.29 (100.00)	5212.90 (100.00)

Figures in parenthesis are percentages to total

Table 15. Inputwise cost of cultivation of TV paddy per hectare in viruppu season - income groups (Figures in Rs)

Particulars	Lowest	Lower	Middle	High	Average
Hired human labour	1542.50 (28.81)	1561.03 (29.77)	1581.70 (30.82)	1633.87 (31.89)	1579.78 (30.30)
Bullock labour/ Tractor	521.29 (9.74)	489.67 (9.34)	485.57 (9.46)	449.91 (8.78)	486.61 (9.33)
Seeds and seedlings	487.40 (9.11)	411.30 (7.84)	436.91 (8.51)	428.02 (8.35)	440.91 (8.46)
Manures	272.73 (5.10)	324.90 (6.20)	340.34 (6.63)	369.24 (7.21)	326.80 (6.27)
Fertilizers	429.68 (8.03)	472.04 (9.00)	413.10 (8.06)	445.61 (8.70)	440.11 (8.44)
Pesticides	26.85 (0.50)	32.77 (0.62)	20.27 (0.39)	40.48 (0.79)	30.09 (0.58)
Miscellaneous	37.71 (0.70)	47.91 (0.91)	43.89 (0.86)	42.45 (0.83)	42.99 (0.83)
Depreciation on implements	116.02 (2.17)	101.60 (1.94)	95.58 (1.86)	93.67 (1.83)	101.72 (1.95)
Interest on working capital	137.37 (2.57)	137.65 (2.63)	136.69 (2.66)	140.13 (2.73)	137.96 (2.65)
Cost A	3571.55 (66.73)	3578.87 (68.25)	3554.05 (69.25)	3643.38 (71.11)	3586.97 (68.81)
Rental value of own land	1113.72 (20.81)	1142.72 (21.79)	1123.45 (21.89)	1149.54 (22.44)	1132.36 (21.72)
Interest on fixed capital	56.99 (1.06)	55.21 (1.06)	63.70 (1.24)	60.54 (1.18)	59.11 (1.14)
Cost B	4742.26 (88.60)	4776.80 (91.10)	4741.20 (92.38)	4853.46 (94.73)	4778.44 (91.67)
Imputed family labour wages	610.01 (11.40)	466.62 (8.90)	390.99 (7.62)	270.21 (5.27)	434.46 (8.33)
Cost C	5352.27 (100.00)	5243.42 (100.00)	5132.19 (100.00)	5123.67 (100.00)	5212.90 (100.00)

Figures in parenthesis are percentages to total

Table 16. Operationwise per hectare cost of cultivation of TV paddy in viruppu season - income groups (Figures in Rs)

Particulars	Lowest	Lower	Middle	High	Average
Preparatory cultivation	943.86 (17.63)	777.18 (14.82)	762.73 (14.86)	729.58 (14.24)	803.34 (15.41)
Seeds and sowing	838.12 (15.66)	796.52 (15.19)	816.95 (15.92)	758.29 (14.80)	802.47 (15.39)
Weeding	329.16 (6.15)	330.10 (6.30)	292.67 (5.70)	269.35 (5.26)	305.32 (5.86)
Plant protection	54.61 (1.03)	64.68 (1.23)	47.99 (0.94)	83.18 (1.62)	62.62 (1.20)
Manures and application	345.15 (6.45)	400.22 (7.63)	422.49 (8.23)	437.14 (8.53)	401.25 (7.70)
Fertilizers and application	446.35 (8.34)	491.60 (9.38)	448.52 (8.74)	466.58 (9.10)	463.26 (8.88)
Irrigation and drainage	299.24 (5.59)	267.05 (5.09)	262.73 (5.12)	255.94 (5.00)	271.24 (5.20)
Harvesting etc.	633.97 (11.84)	630.98 (12.03)	614.80 (11.98)	637.28 (12.44)	629.26 (12.07)
Miscellaneous	37.71 (0.70)	47.91 (0.91)	43.89 (0.86)	43.45 (0.83)	42.99 (0.83)
Depreciation on implements	116.02 (2.17)	101.60 (1.94)	95.58 (1.86)	93.67 (1.83)	101.72 (1.95)
Interest on working capital	137.37 (2.57)	137.65 (2.63)	136.69 (2.66)	140.13 (2.73)	137.96 (2.65)
Less family wages	610.01	466.62	390.99	270.21	434.46
Cost A	3571.55 (66.73)	3578.87 (68.25)	3554.05 (69.25)	3643.38 (71.11)	3586.97 (68.81)
Rental value of own land	1113.72 (20.81)	1142.72 (21.79)	1123.45 (21.89)	1149.54 (22.44)	1132.36 (21.72)
Interest on fixed capital	56.99 (1.06)	55.21 (1.06)	63.70 (1.24)	60.54 (1.18)	59.11 (1.14)
Cost B	4742.26 (88.60)	4776.80 (91.10)	4741.20 (92.38)	4853.46 (94.73)	4778.44 (91.67)
Imputed family labour wages	610.01 (11.40)	466.62 (8.90)	390.99 (7.62)	270.21 (5.27)	434.46 (8.33)
Cost C	5352.27 (100.00)	5243.42 (100.00)	5132.19 (100.00)	5123.67 (100.00)	5212.90 (100.00)

Figures in parenthesis are percentages to total

Table 17. Per hectare yield and income at different costs from TV paddy in viruppu season - holding size groups

Particulars	Smallest	Small	Medium	Large	Average
Quantity of grain (kg)	2586.56	2575.49	2588.58	2728.14	2619.64
Quantity of byproduct (bundles)	1715.00	1675.00	1670.00	1700.00	1690.00
Value of grain (Rs)	3798.93	3644.10	3670.63	3773.51	3721.79
Value of byproduct (Rs)	1715.00	1675.00	1670.00	1700.00	1690.00
Gross value (Rs)	5513.93	5319.10	5340.63	5473.51	5411.79
Farm business income (Rs)	1910.86	1767.85	1747.21	1873.38	1824.82
Family labour income (Rs)	725.47	586.71	548.91	672.33	633.35
Net income (Rs)	2.06	172.17	228.14	393.22	198.89
Benefit cost ratio at Cost A	1.530	1.498	1.486	1.520	1.509
Cost B	1.152	1.124	1.115	1.140	1.133
Cost C	1.000	1.033	1.045	1.077	1.038
Cost/quintal of grain at Cost C (Rs)	146.80	134.81	132.99	123.90	134.48

Table 18. Per hectare yield and income at different costs from TV paddy in viruppu season - income groups

Particulars	Lowest	Lower	Middle	High	Average
Quantity of grain (kg)	2620.40	2600.10	2536.22	2721.85	2619.64
Quantity of byproduct (bundles)	1653.00	1723.00	1710.00	1674.00	1690.00
Value of grain (Rs)	3765.61	3740.60	3657.27	3723.69	3721.79
Value of byproduct (Rs)	1653.00	1723.00	1710.00	1674.00	1690.00
Gross value (Rs)	5418.61	5463.60	5367.27	5397.69	5411.79
Farm business income (Rs)	1847.06	1884.73	1813.22	1754.31	1824.82
Family labour income (Rs)	676.35	686.80	626.07	544.23	633.35
Net income (Rs)	66.34	220.18	235.08	274.02	198.89
Benefit cost ratio at Cost A	1.517	1.527	1.510	1.482	1.509
Cost B	1.143	1.144	1.132	1.112	1.133
Cost C	1.012	1.042	1.046	1.053	1.038
Cost/quintal of grain at cost C (Rs)	141.17	135.40	134.93	126.74	134.48

Table 19. Inputwise cost of cultivation of HYV paddy per hectare in mundakan season - holding size groups (Figures in Rs)

Particulars	Smallest	Small	Medium	Large	Average
Hired human labour	1574.51 (26.37)	1698.88 (30.23)	1660.67 (31.95)	1680.76 (31.86)	1653.70 (29.99)
Bullock labour/tractor	294.79 (4.94)	459.32 (8.17)	300.69 (5.79)	342.26 (6.49)	349.27 (6.33)
Seeds and seedlings	461.89 (7.74)	301.67 (5.37)	307.74 (5.92)	326.97 (6.20)	349.57 (6.34)
Manures	318.70 (5.34)	428.98 (7.63)	250.58 (4.82)	355.21 (6.73)	338.37 (6.13)
Fertilizers	689.00 (11.54)	424.66 (7;56)	433.13 (8.33)	438.12 (8.30)	496.23 (9.00)
Pesticides	38.23 (0.64)	42.45 (0.76)	25.04 (0.48)	39.98 (0.76)	36.43 (0.66)
Irrigation cess	33.90 (0.57)	10.49 (0.19)	41.59 (0.80)	26.98 (0.51)	28.24 (0.51)
Miscellaneous	30.74 (0.51)	64.40 (1.14)	26.27 (0.51)	28.43 (0.73)	39.96 (0.72)
Depreciation on implements	130.23 (2.18)	115.99 (2.06)	98.23 (1.89)	62.42 (1.18)	101.72 (1.84)
Interest on working capital	142.88 (2.39)	141.87 (2.52)	125.76 (2.42)	132.45 (2.51)	135.74 (2.46)
Cost A	3714.87 (62.22)	3688.71 (65.63)	3269.70 (62.91)	3443.58 (65.27)	3529.22 (63.98)
Rental value of own land	1441.18 (24.14)	1530.51 (27.23)	1440.45 (27.71)	1445.79 (27.40)	1464.48 (26.55)
Interest on fixed capital	72.60 (1.21)	67.32 (1.20)	60.17 (1.16)	36.35 (0.69)	59.11 (1.07)
Cost B	5228.65 (87.57)	5286.54 (94.06)	4770.32 (91.78)	4925.72 (93.36)	5052.81 (91.60)
Imputed family labour wages	742.18 (12.43)	334.09 (5.94)	427.40 (8.22)	350.39 (6.64)	463.52 (8.40)
Cost C	5970.83 (100.00)	5620.63 (100.00)	5197.72 (100.00)	5276.11 (100.00)	5516.32 (100.00)

Figures in parenthesis are percentages to total

Table 20. Operationwise per hectare cost of cultivation of HYV paddy in mundakan season - holding size groups (Figures in Rs)

Particulars	Smallest	Small	Medium	Large	Average
Preparatory cultivation	640.17 (10.72)	583.73 (10.39)	559.55 (10.77)	579.50 (10.98)	590.74 (10.71)
Seeds and sowing	759.97 (12.73)	470.15 (8.36)	538.35 (10.36)	548.09 (10.39)	579.14 (10.50)
Weeding	437.18 (7.32)	420.60 (7.48)	389.09 (7.49)	370.34 (7.03)	404.30 (7.33)
Plant protection	62.14 (1.04)	64.22 (1.16)	56.39 (1.07)	78.79 (1.49)	65.39 (1.18)
Manures and application	370.50 (6.21)	534.74 (9.51)	343.51 (6.61)	449.19 (8.51)	424.49 (7.70)
Fertilizers and application	726.44 (12.17)	450.15 (8.01)	479.64 (9.23)	485.89 (9.21)	535.53 (9.71)
Irrigation and drainage	302.65 (5.07)	273.33 (4.86)	260.57 (5.01)	235.33 (4.46)	267.97 (4.86)
Harvesting etc.	854.15 (14.31)	903.62 (16.08)	819.74 (15.77)	813.54 (15.42)	847.76 15.37)
Miscellaneous	30.74 (0.51)	64.40 (1.14)	26.27 (0.51)	38.43 (0.73)	39.96 (0.72)
Depreciation on implements	130.23 (2.18)	115.99 (2.06)	98.23 (1.89)	62.42 (1.18)	101.72 (1.84)
Interest on working capital	142.88 (2.39)	141.87 (2.52)	125.76 (2.42)	132.45 (2.51)	135.74 (2.46)
Less of family wages	742.18	334.09	427.40	350.39	463.52
Cost A	3714.87 (62.22)	3688.71 (65.63)	3269.70 (62.91)	3443.58 (65.27)	3529.22 (63.98)
Rental value of own land	1441.18 (24.14)	1530.51 (27.23)	1440.45 (27.71)	1445.79 (27.40)	1464.48 (26.55)
Interest on fixed capital	72.60 (1.21)	67.32 (1.20)	60.17 (1.16)	36.35 (0.69)	59.11 (1.07)
Cost B	5228.65 (87.57)	5286.54 (94.06)	4770.32 (91.78)	4925.72 (93.36)	5052.81 (91.60)
Imputed Family labour wages	742.18 (12.43)	334.09 (5.94)	427.40 (8.22)	350.39 (6.64)	463.52 (8.40)
Cost C	5970.83 (100.00)	5620.63 (100.00)	5197.72 (100.00)	5276.11 (100.00)	5516.32 (100.00)

Figures in parenthesis are percentages to total

Table 21. Inputwise cost of cultivation of HYV paddy per hectare in mundakan season - income groups (Figures in Rs)

Particulars	Lowest	Lower	Middle	High	Average
Hired human labour	1383.74 (26.76)	1816.35 (29.67)	662.92 (31.55)	1751.81 (31.84)	1653.70 (29.99)
Bullock labour/ Tractor	287.00 (5.55)	399.89 (6.53)	337.27 (6.40)	372.90 (6.78)	349.27 (6.33)
Seeds and seedling	446.36 (8.63)	320.15 (5.23)	291.50 (5.53)	340.26 (6.18)	349.57 (6.34)
Manures	247.00 (4.78)	427.47 (6.98)	313.44 (5.95)	365.56 (6.64)	338.37 (6.13)
Fertilizers	450.77 (8.72)	597.95 (9.77)	433.55 (8.23)	502.64 (9.13)	496.23 (9.00)
Pesticides	-	48.33 (0.79)	45.12 (0.86)	52.25 (0.95)	36.43 (0.66)
Irrigation cess	32.11 (0.62)	42.95 (0.70)	7.03 (0.13)	30.87 (0.56)	28.24 (0.51)
Miscellaneous	32.11 (0.61)	58.04 (0.96)	23.56 (0.45)	46.13 (0.85)	39.96 (0.72)
Depreciation on implements	116.02 (2.24)	101.60 (1.66)	95.58 (1.81)	93.67 (1.70)	101.72 (1.84)
Interest on working capital	119.80 (2.32)	152.51 (2.49)	128.40 (2.44)	142.24 (2.58)	135.74 (2.46)
Cost A	3114.91 (60.23)	3965.24 (64.78)	3338.37 (63.35)	3698.33 (67.21)	3529.22 (63.98)
Rental value of own land	1395.00 (26.97)	1543.38 (25.22)	1431.22 (27.16)	1488.32 (27.05)	1464.48 (26.55)
Interest on fixed capital	56.99 (1.10)	55.21 (0.90)	63.70 (1.21)	60.54 (1.10)	59.11 (1.07)
Cost B	4566.90 (88.30)	5563.83 (90.90)	4833.29 (91.72)	5247.19 (95.36)	5052.81 (91.60)
Imputed family labour wages	605.15 (11.70)	557.32 (9.10)	436.20 (8.28)	255.39 (4.64)	463.52 (8.40)
Cost C	5172.05 (100.00)	6121.15 (100.00)	5269.49 (100.00)	5502.58 (100.00)	5516.32 (100.00)

Figures in parenthesis are percentages to total

Table 22. Operationwise per hectare cost of cultivation of HYV paddy in mundakan season - income groups (Figures in Rs)

Particulars	Lowest	Lower	Middle	High	Average
Preparatory cultivation	650.00 (12.57)	584.81 (9.55)	570.67 (10.83)	557.47 (10.13)	590.74 (10.71)
Seeds and sowing	674.71 (13.05)	561.26 (9.17)	530.16 (10.06)	550.43 (10.00)	579.14 (10.50)
Weeding	397.00 (7.68)	418.00 (6.83)	404.09 (7.67)	398.12 (7.24)	404.30 (7.33)
Plant protection	-	96.92 (1.57)	78.46 (1.49)	86.16 (1.56)	65.39 (1.18)
Manures and application	318.75 (6.16)	540.99 (8.84)	399.78 (7.59)	438.42 (7.97)	424.49 (7.70)
Fertilizers and application	474.36 (9.17)	640.45 (10.46)	484.50 (9.19)	542.81 (9.86)	535.53 (9.71)
Irrigation and drainage	228.42 (4.42)	312.03 (5.10)	257.74 (4.89)	273.69 (4.97)	267.97 (4.86)
Harvesting etc.	708.89 (13.71)	1055.95 (17.25)	801.63 (15.21)	824.58 (14.99)	847.76 (15.37)
Miscellaneous	32.11 (0.61)	58.04 (0.96)	23.56 (0.45)	46.13 (0.85)	39.96 (0.72)
Depreciation on implements	116.02 (2.24)	101.60 (1.66)	95.58 (1.81)	93.67 (1.70)	101.72 (1.84)
Interest on working capital	119.80 (2.32)	152.51 (2.49)	128.40 (2.44)	142.24 (2.58)	135.74 (2.46)
Less family wages	605.15	557.32	436.20	255.39	463.52
Cost A	3114.91 (60.23)	3965.24 (64.78)	3338.37 (63.35)	3698.33 (67.21)	3529.22 (63.98)
Rental value of own land	1395.00 (26.97)	1543.38 (25.22)	1431.22 (27.16)	1488.32 (27.05)	1464.48 (26.55)
Interest on fixed capital	56.99 (1.10)	55.21 (0.90)	63.70 (1.21)	60.54 (1.10)	59.11 (1.07)
Cost B	4566.90 (88.30)	5563.83 (90.90)	4833.29 (91.72)	5247.19 (95.36)	5052.81 (91.60)
Imputed family labour wages	605.15 (11.70)	557.32 (9.10)	436.20 (8.28)	255.39 (4.64)	463.52 (8.40)
Cost C	5172.05 (100.00)	6121.15 (100.00)	5269.49 (100.00)	5502.58 (100.00)	5516.32 (100.00)

Figures in parenthesis are percentages to total

Table 23. Per hectare yield and income at different costs from HYV paddy in mundakan season - holding size groups

Particulars	Smallest	Small	Medium	Large	Average
Quantity of grain (kg)	3470.80	3460.00	3456.00	3430.00	3454.33
Quantity of byproduct (bundles)	1590.00	1850.00	1770.00	1830.00	1760.00
Value of grain (Rs)	5265.90	5352.55	4982.27	4948.94	5137.42
Value of byproduct (Rs)	1590.00	1850.00	1770.00	1830.00	1760.00
Gross value (Rs)	6855.90	7202.55	6752.27	6778.94	6897.42
Farm business income (Rs)	3141.03	3513.84	3482.57	3335.36	3368.20
Family labour income (Rs)	1627.25	1916.01	1981.95	1853.22	1844.61
Net income (Rs)	885.07	1581.92	1554.55	1502.83	1381.10
Benefit cost ratio at Cost A	1.85	1.95	2.07	1.97	1.95
Cost B	1.31	1.36	1.42	1.38	1.37
Cost C	1.15	1.28	1.30	1.28	1.25
Cost/quintal of grain at cost C (Rs)	126.22	108.98	99.18	100.47	108.74

Table 24. Per hectare yield and income at different costs from HYV paddy in mundakan season - income groups

Particulars	Lowest	Lower	Middle	High	Average
Quantity of grain (kg)	3387.50	3542.50	3379.90	3507.40	3454.33
Quantity of byproduct (bundles)	1598.00	1808.00	1820.00	1822.00	1760.00
Value of grain (Rs)	5027.00	5458.00	4886.08	5169.61	5137.42
Value of byproduct (Rs)	1598.00	1808.00	1820.00	1822.00	1760.00
Gross value (Rs)	6625.00	7266.00	6706.08	6991.61	6897.42
Farm business income (Rs)	3510.09	3300.76	3367.71	3293.20	3368.20
Family labour income (Rs)	2058.10	1702.17	1872.78	1744.42	1844.61
Net income (Rs)	1452.95	1144.85	1436.59	1489.03	1381.10
Benefit cost ratio at Cost A	2.13	1.83	2.01	1.89	1.95
Cost B	1.45	1.31	1.39	1.33	1.37
Cost C	1.28	1.19	1.27	1.27	1.25
Cost/quintal of grain at cost C(Rs)	105.51	121.75	102.06	104.94	108.74

Table 25. Inputwise cost of cultivation per hectare of TV paddy in mundakan season - holding size groups (Figures in Rs)

Particulars	Smallest	Small	Medium	Large	Average
Hired human labour	1180.90 (24.05)	1229.61 (26.40)	1302.70 (28.06)	1537.56 (30.79)	1312.70 (27.34)
Bullock labour/ Tractor	397.57 (8.10)	399.54 (8.58)	369.98 (7.97)	468.65 (9.38)	408.94 (8.52)
Seeds and seedlings	326.92 (6.66)	307.31 (6.60)	257.27 (5.54)	342.58 (6.86)	308.52 (6.43)
Manures	389.09 (7.92)	278.27 (5.98)	371.71 (8.00)	389.14 (7.79)	357.05 (7.44)
Fertilizers	344.07 (7.01)	419.48 (9.01)	393.22 (8.47)	405.15 (8.11)	390.48 (8.13)
Pesticides	10.22 (0.20)	24.99 (0.54)	32.11 (0.68)	35.71 (0.72)	25.76 (0.54)
Irrigation cess	21.41 (0.44)	18.00 (0.39)	28.65 (0.62)	20.99 (0.42)	22.26 (0.46)
Miscellaneous	50.80 (1.03)	41.52 (0.89)	51.87 (1.12)	54.41 (1.09)	49.65 (1.03)
Depreciation on implements	130.23 (2.65)	115.99 (2.49)	98.23 (2.12)	62.42 (1.25)	101.72 (2.12)
Interest on working capital	114.05 (2.32)	113.39 (2.43)	116.20 (2.50)	132.66 (2.66)	119.08 (2.48)
Cost A	2965.26 (60.38)	2948.10 (63.31)	3021.97 (65.09)	3449.27 (69.07)	3096.15 (64.49)
Rental value of own land	1216.08 (24.76)	1257.86 (27.01)	1280.91 (27.58)	1310.19 (26.23)	1266.26 (26.37)
Interest on fixed capital	72.60 (1.48)	67.32 (1.45)	60.17 (1.30)	36.35 (0.73)	59.11 (1.23)
Cost B	4253.94 (86.62)	4273.28 (91.77)	4363.05 (93.97)	4795.81 (96.03)	4421.52 (92.09)
Imputed family labour wages	657.04 (13.38)	383.41 (8.23)	279.80 (6.03)	198.34 (3.97)	379.65 (7.91)
Cost C	4910.98 (100.00)	4656.69 (100.00)	4642.85 (100.00)	4994.15 (100.00)	4801.17 (100.00)

Figures in parenthesis are percentages to total

Table 26. Operationwise cost of cultivation per hectare of TV paddy in mundakan season - holding size groups (Figures in Rs)

Particulars	Smallest	Small	Medium	Large	Average
Preparatory cultivation	603.71 (12.29)	530.58 (11.39)	509.68 (10.98)	602.53 (12.06)	561.63 (11.70)
Seeds and sowing	485.70 (9.89)	449.68 (9.66)	355.58 (7.66)	540.50 (10.82)	457.87 (9.54)
Weeding	357.80 (7.29)	303.29 (6.51)	290.64 (6.26)	331.54 (6.64)	320.82 (6.68)
Manures and application	486.58 (9.91)	344.14 (7.39)	456.23 (9.83)	487.44 (9.76)	443.60 (9.24)
Plant protection	30.56 (0.63)	56.43 (1.22)	65.89 (1.41)	74.59 (1.50)	56.87 (1.19)
Fertilisers and application	378.85 (7.71)	440.37 (9.46)	418.12 (9.01)	441.21 (8.83)	419.64 (8.74)
Irrigation and drainage	316.36 (6.44)	283.18 (6.08)	261.78 (5.64)	219.33 (4.39)	270.16 (5.63)
Harvesting etc.	667.66 (13.60)	652.94 (14.02)	677.52 (14.59)	700.98 (14.04)	674.78 (14.05)
Miscellaneous	50.80 (1.03)	41.52 (0.89)	51.87 (1.12)	54.41 (1.09)	49.65 (1.03)
Depreciation on implements	130.23 (2.65)	115.99 (2.49)	98.23 (2.12)	62.42 (1.25)	101.72 (2.12)
Interest on working capital	114.05 (2.32)	113.39 (2.43)	116.20 (2.50)	132.66 (2.66)	119.08 (2.48)
Less family wages	657.04	383.41	279.80	198.34	379.65
Cost A	2965.26 (60.38)	2948.10 (63.31)	3021.97 (65.09)	3449.27 (69.07)	3096.15 (64.49)
Rental value of own land	1216.08 (24.76)	1257.86 (27.01)	1280.91 (27.58)	1310.19 (26.23)	1266.26 (26.37)
Interest on fixed capital	72.60 (1.48)	67.32 (1.45)	60.17 (1.30)	36.35 (0.73)	59.11 (1.23)
Cost B	4253.94 (86.62)	4273.28 (91.77)	4363.05 (93.97)	4795.81 (96.03)	4421.52 (92.09)
Imputed family labour wages	657.04 (13.38)	383.41 (8.23)	279.80 (6.03)	198.34 (3.97)	379.65 (7.91)
Cost C	4910.98 (100.00)	4656.69 (100.00)	4642.85 (100.00)	4994.15 (100.00)	4801.17 (100.00)

Figures in parenthesis are percentages to total

Table 27. Inputwise cost of cultivation per hectare of TV paddy in mundakan season - income groups (Figures in Rs)

Particulars	Lowest	Lower	Middle	High	Average
Hired human labour	1180.89 (24.47)	1264.04 (26.66)	1315.86 (27.87)	1489.98 (30.31)	1312.70 (27.34)
Bullock labour/ Tractor	377.30 (7.82)	394.12 (8.31)	446.13 (9.45)	418.19 (8.51)	408.94 (8.52)
Seeds and seedling	310.23 (6.43)	304.86 (6.43)	281.94 (5.97)	337.05 (6.86)	308.52 (6.43)
Manures	313.24 (6.49)	320.40 (6.76)	394.14 (8.35)	400.43 (8.15)	357.05 (7.44)
Fertilizers	365.80 (7.58)	457.16 (9.64)	347.98 (7.37)	390.98 (7.95)	390.48 (8.13)
Pesticides	13.62 (0.28)	28.36 (0.61)	24.60 (0.52)	36.45 (0.75)	25.76 (0.54)
Irrigation cess	19.76 (0.40)	19.90 (0.42)	15.26 (0.32)	34.13 (0.69)	22.26 (0.46)
Miscellaneous	43.34 (0.90)	45.67 (0.96)	52.94 (1.12)	56.65 (1.15)	49.65 (1.03)
Depreciation on implements	116.02 (2.40)	101.60 (2.14)	95.58 (2.02)	93.67 (1.91)	101.72 (2.12)
Interest on working capital	109.61 (2.27)	117.44 (2.48)	118.98 (2.52)	130.30 (2.65)	119.08 (2.48)
Cost A	2849.81 (59.04)	3053.55 (64.41)	3093.41 (65.51)	3387.83 (68.93)	3096.15 (64.49)
Rental value of own land	1248.18 (25.86)	1262.16 (26.62)	1282.90 (27.17)	1271.80 (25.88)	1266.26 (26.37)
Interest on fixed capital	56.99 (1.18)	55.21 (1.16)	63.70 (1.35)	60.54 (1.23)	59.11 (1.23)
Cost B	4154.98 (86.08)	4370.92 (92.19)	4440.01 (94.03)	4720.17 (96.04)	4421.52 (92.09)
Imputed family labour wages	671.87 (13.92)	370.08 (7.81)	281.81 (5.97)	194.83 (3.96)	379.65 (7.91)
Cost C	4826.85 (100.00)	4741.00 (100.00)	4721.82 (100.00)	4915.00 (100.00)	4801.17 (100.00)

Figures in parenthesis are percentages to total

Table 28. Operationwise cost of cultivation per hectare of TV paddy in mundakan season - income groups (Figures in Rs)

Particulars	Lowest	Lower	Middle	High	Average
Preparatory cultivation	645.10 (13.36)	528.43 (11.15)	515.59 (10.92)	557.38 (11.34)	561.63 (11.70)
Seeds and sowing	456.40 (9.46)	426.12 (8.99)	411.99 (8.73)	536.95 (10.92)	457.87 (9.54)
Weeding	354.66 (7.35)	294.94 (6.22)	330.38 (7.00)	303.29 (6.17)	320.82 (6.68)
Plant protection	37.65 (0.77)	62.93 (1.33)	52.40 (1.10)	74.49 (1.52)	56.87 (1.19)
Manures and application	398.55 (8.26)	400.11 (8.44)	481.91 (10.21)	493.82 (10.05)	443.60 (9.24)
Fertilizers and application	394.65 (8.18)	490.13 (10.34)	374.00 (7.92)	419.77 (8.54)	419.64 (8.74)
Irrigation and drainage	307.04 (6.36)	282.33 (5.96)	256.26 (5.43)	235.02 (4.78)	270.16 (5.63)
Harvesting etc.	658.66 (13.65)	673.93 (14.21)	685.19 (14.51)	681.32 (13.86)	674.78 (14.05)
Miscellaneous	43.34 (0.90)	45.67 (0.96)	52.94 (1.12)	56.65 (1.15)	49.65 (1.03)
Depreciation on implements	116.02 (2.40)	101.60 (2.14)	95.58 (2.02)	93.67 (1.91)	101.72 (2.12)
Interest on working capital	109.61 (2.27)	117.44 (2.48)	118.98 (2.52)	130.30 (2.65)	119.08 (2.48)
Less family wages	671.87	370.08	281.81	194.83	379.65
Cost A	2849.81 (59.04)	3053.55 (64.41)	3093.41 (65.51)	3387.83 (68.93)	3096.15 (64.49)
Rental value of own land	1248.18 (25.86)	1262.16 (26.62)	1282.90 (27.17)	1271.80 (25.88)	1266.26 (26.37)
Interest on fixed capital	56.99 (1.18)	55.21 (1.16)	63.70 (1.35)	60.54 (1.23)	59.11 (1.23)
Cost B	4154.98 (86.08)	4370.92 (92.19)	4440.01 (94.03)	4720.17 (96.04)	4421.52 (92.09)
Imputed family labour wages	671.87 (13.92)	370.08 (7.81)	281.81 (5.97)	194.83 (3.96)	379.65 (7.91)
Cost C	4826.85 (100.00)	4741.00 (100.00)	4721.82 (100.00)	4915.00 (100.00)	4801.17 (100.00)

Figures in parenthesis are percentages to total

Table 29. Per hectare yield and income at different costs from TV paddy in mundakan season - holding size groups

Particulars	Smallest	Small	Medium	Large	Average
Quantity of grain (kg)	2648.70	2737.30	2697.35	2791.25	2718.65
Quantity of byproduct (bundles)	1700.00	1725.00	1745.00	1845.00	1753.75
Value of grain (Rs)	3730.40	3914.30	4009.55	4055.93	3927.55
Value of byproduct (Rs)	1700.00	1725.00	1745.00	1845.00	1753.75
Gross value (Rs)	5430.40	5639.30	5754.55	5900.93	5681.30
Farm business income (Rs)	2465.14	2691.20	2732.58	2451.66	2585.15
Family labour income (Rs)	1176.46	1366.02	1391.50	1105.12	1259.78
Net income (Rs)	519.42	982.61	1111.70	906.78	880.13
Benefit cost ratio at Cost A	1.831	1.913	1.904	1.711	1.835
Cost B	1.277	1.320	1.319	1.230	1.285
Cost C	1.106	1.211	1.239	1.182	1.183
Cost/quintal of grain at cost C (Rs)	121.23	107.10	107.43	112.82	112.09

Table 30. Per hectare yield and income at different costs from TV paddy in mundakan season - income groups

Particulars	Lowest	Lower	Middle	High	Average
Quantity of grain (kg)	2681.19	2690.95	2782.50	2720.00	2718.65
Quantity of byproduct (bundles)	1805.00	1743.00	1707.00	1760.00	1753.75
Value of grain (Rs)	3785.88	3917.80	4057.50	3949.00	3927.55
Value of byproduct (Rs)	1805.00	1743.00	1707.00	1760.00	1753.75
Gross value (Rs)	5590.88	5660.80	5764.50	5709.00	5681.30
Farm business income (Rs)	2749.07	2607.25	2671.09	2321.17	2585.15
Family labour income (Rs)	1435.90	1289.88	1324.49	988.83	1259.78
Net income (Rs)	764.03	919.80	1042.68	794.00	880.13
Benefit cost ratio at Cost A	1.962	1.854	1.863	1.685	1.835
Cost B	1.346	1.295	1.298	1.209	1.285
Cost C	1.158	1.194	1.221	1.162	1.183
Cost/quintal of grain at cost C (Rs)	112.71	111.41	108.35	115.99	112.09

Table 31. Inputwise cost of cultivation per hectare of HYV paddy in puncha season - holding size groups (Figures in Rs)

Particulars	Smallest	Small	Medium	Large	Average
Hired human labour	1470.07 (23.45)	1432.90 (26.24)	1430.92 (26.92)	1537.57 (28.40)	1467.86 (26.14)
Bullock labour/ Tractor	346.27 (5.52)	283.30 (5.19)	461.07 (8.67)	287.08 (5.30)	344.43 (6.13)
Seeds	247.00 (3.94)	249.90 (4.58)	233.83 (4.40)	197.60 (3.65)	232.08 (4.13)
Manures	389.98 (6.22)	196.14 (3.59)	400.07 (7.52)	432.25 (7.98)	354.61 (6.32)
Fertilizers	731.89 (11.68)	491.08 (8.99)	403.42 (7.59)	308.75 (5.70)	483.79 (8.62)
Pesticides	41.32 (0.65)	20.35 (0.36)	49.40 (0.93)	77.18 (1.43)	47.06 (0.84)
Irrigation (Pumpset)	460.43 (7.35)	442.63 (8.10)	30.80 (0.58)	300.22 (5.55)	308.52 (5.49)
Miscellaneous	74.37 (1.19)	25.71 (0.47)	74.10 (1.39)	61.75 (1.14)	58.98 (1.05)
Depreciation on implements	130.23 (2.08)	115.98 (2.12)	98.23 (1.85)	62.42 (1.15)	101.72 (1.81)
Interest on working capital	155.66 (2.48)	130.32 (2.39)	127.27 (2.39)	130.59 (2.41)	135.96 (2.42)
Cost A	4047.22 (64.56)	3388.31 (62.03)	3309.11 (62.24)	3395.11 (62.71)	3534.94 (62.95)
Rental value of own land	1625.00 (25.93)	1615.49 (29.58)	1657.00 (31.16)	1543.75 (28.52)	1610.31 (28.68)
Interest on fixed capital	72.60 (1.16)	67.32 (1.23)	60.17 (1.13)	36.35 (0.67)	59.11 (1.05)
Cost B	5744.82 (91.65)	5071.12 (92.84)	5026.28 (94.53)	4975.21 (91.90)	5204.36 (92.68)
Imputed family labour wages	523.71 (8.35)	390.85 (7.16)	290.64 (5.47)	438.42 (8.10)	410.91 (7.32)
Cost C	6268.53 (100.00)	5461.97 (100.00)	5316.92 (100.00)	5413.63 (100.00)	5615.26 (100.00)

Figures in parenthesis are percentages to total

Table 32. Operationwise cost of cultivation per hectare of HYV paddy in puncha season - holding size groups (Figures in Rs)

Particulars	Smallest	Small	Medium	Large	Average
Preparatory cultivation	558.00 (8.90)	448.94 (8.22)	520.35 (9.79)	383.48 (10.78)	527.69 (9.40)
Seeds and sowing	295.28 (4.71)	293.48 (5.37)	270.88 (5.09)	237.73 (4.39)	274.34 (4.89)
Weeding	284.57 (4.54)	228.10 (4.18)	296.40 (5.57)	370.50 (6.84)	294.89 (5.25)
Plant protection	80.32 (1.28)	42.13 (0.76)	75.75 (1.43)	138.93 (2.57)	84.28 (1.50)
Manures and application	495.85 (7.91)	232.47 (4.26)	512.06 (9.63)	549.57 (10.15)	447.49 (7.97)
Fertilizers and application	776.29 (12.38)	517.24 (9.47)	433.06 (8.14)	318.01 (5.87)	511.15 (9.10)
Irrigation	701.58 (11.19)	698.37 (12.79)	195.45 (3.68)	454.60 (8.40)	512.50 (9.13)
Harvesting etc.	1018.78 (16.25)	1046.42 (19.16)	996.20 (18.74)	926.25 (17.11)	996.91 (17.75)
Miscellaneous	74.37 (1.19)	25.71 (0.47)	74.10 (1.39)	61.75 (1.14)	58.98 (1.05)
Depreciation on implements	130.23 (2.08)	115.98 (2.12)	98.23 (1.85)	62.42 (1.15)	101.72 (1.81)
Interest on working capital	155.66 (2.48)	130.32 (2.39)	127.27 (2.39)	130.59 (2.41)	135.96 (2.42)
Less family wages	523.71	390.85	290.64	438.42	410.91
Cost A	4047.22 (64.56)	3388.31 (62.03)	3309.11 (62.24)	3395.11 (62.71)	3534.94 (62.95)
Rental value of own land	1625.00 (25.93)	1615.49 (29.58)	1657.00 (31.16)	1543.75 (28.52)	1610.31 (28.68)
Interest on fixed capital	72.60 (1.16)	67.32 (1.23)	60.17 (1.13)	36.35 (0.67)	59.11 (1.05)
Cost B	5744.82 (91.65)	5071.12 (92.84)	5026.28 (94.53)	4975.21 (91.90)	5204.36 (92.68)
Imputed family labour wages	523.71 (8.35)	390.85 (7.16)	290.64 (5.47)	438.42 (8.10)	410.91 (7.32)
Cost C	6268.53 (100.00)	5461.97 (100.00)	5316.92 (100.00)	5413.63 (100,00)	5615.26 (100.00)

Figures in parenthesis are percentages to total

Table 33. Inputwise cost of cultivation per hectare of HYV paddy in puncha season - income groups (Figures in Rs)

Particulars	Lowest	Lower	Middle	High	Average
Hired human labour	1211.49 (25.38)	1482.36 (25.31)	1591.44 (25.36)	1586.17 (28.56)	1467.86 (26.14)
Bullock labour/ Tractor	385.93 (8.08)	296.40 (5.06)	234.32 (3.73)	461.07 (8.30)	344.43 (6.13)
Seeds	242.43 (5.08)	251.70 (4.30)	212.94 (3.39)	221.26 (3.98)	232.08 (4.13)
Manures	360.20 (7.54)	259.65 (4.43)	337.52 (5.38)	461.07 (8.30)	354.61 (6.32)
Fertilizers	308.75 (6.47)	617.50 (10.55)	605.47 (9.65)	403.42 (7.26)	483.79 (8.62)
Pesticides	52.45 (1.09)	-	56.40 (0.89)	79.40 (1.43)	47.06 (0.84)
Irrigation (Pumpset)	32.15 (0.67)	448.17 (7.65)	722.96 (11.52)	30.80 (0.55)	308.52 (5.49)
Miscellaneous	52.39 (1.10)	49.40 (0.84)	60.04 (0.96)	74.10 (1.33)	58.98 (1.05)
Depreciation on implements	116.02 (2.43)	101.60 (1.74)	95.58 (1.52)	93.67 (1.69)	101.72 (1.81)
Interest on working capital	110.47 (2.31)	140.27 (2.40)	156.67 (2.50)	136.44 (2.46)	135.96 (2.42)
Cost A	2872.28 (60.15)	3647.05 (62.28)	4073.34 (64.90)	3547.40 (63.86)	3534.94 (62.95)
Rental value of own land	1340.05 (28.06)	1747.80 (29.85)	1697.53 (27.05)	1656.00 (29.81)	1610.31 (28.68)
Interest on fixed capital	56.99 (1.20)	55.21 (0.94)	63.70 (1.01)	60.54 (1.10)	59.11 (1.05)
Cost B	4269.32 (89.41)	5450.06 (93.07)	5834.57 (92.96)	5263.94 (94.77)	5204.36 (92.68)
Imputed family labour wages	505.58 (10.59)	405.65 (6.93)	441.75 (7.04)	290.64 (5.23)	410.91 (7.32)
Cost C	4774.90 (100.00)	5855.71 (100.00)	6276.32 (100.00)	5554.58 (100.00)	5615.26 (100.00)

Figures in parenthesis are percentages to total

Table 34. Operationwise cost of cultivation per hectare of HYV paddy in puncha season - income groups (Figures in Rs)

Particulars	Lowest	Lower	Middle	High	Average
Preparatory cultivation	518.56 (10.86)	529.06 (9.03)	502.33 (8.00)	560.82 (10.10)	527.69 (9.40)
Seeds and sowing	282.60 (5.92)	296.55 (5.06)	258.21 (4.11)	260.01 (4.68)	274.34 (4.89)
Weeding	296.99 (6.22)	296.55 (5.06)	258.21 (4.11)	330.31 (5.93)	294.89 (5.25)
Plant protection	88.17 (1.85)	-	106.21 (1.69)	142.75 (2.57)	84.28 (1.50)
Manures and application	467.98 (9.80)	320.17 (5.47)	416.24 (6.63)	585.56 (10.54)	447.49 (7.97)
Fertilizers and application	331.91 (6.95)	644.46 (11.01)	630.17 (10.06)	438.06 (7.89)	511.15 (9.10)
Irrigation	289.45 (6.06)	628.69 (10.74)	911.47 (14.52)	220.40 (3.97)	512.50 (9.13)
Harvesting etc.	823.32 (17.24)	1045.95 (17.86)	1119.96 (17.84)	995.92 (17.93)	996.91 (17.75)
Miscellaneous	52.39 (1.10)	49.40 (0.84)	60.04 (0.96)	74.10 (1.33)	58.98 (1.05)
Depreciation on implements	116.02 (2.43)	101.60 (1.74)	95.58 (1.52)	93.67 (1.69)	101.72 (1.81)
Interest on working capital	110.47 (2.31)	140.27 (2.40)	156.67 (2.50)	136.44 (2.46)	135.96 (2.42)
Less family wages	505.58	405.65	441.75	290.64	410.91
Cost A	2872.28 (60.15)	3647.05 (62.28)	4073.34 (64.90)	3547.40 (63.86)	3534.94 (62.95)
Rental value of own land	1340.05 (28.06)	1747.80 (29.85)	1697.53 (27.05)	1656.00 (29.81)	1610.31 (28.68)
Interest on fixed capital	56.99 (1.20)	55.21 (0.94)	63.70 (1.01)	60.54 (1.10)	59.11 (1.05)
Cost B	4269.32 (89.41)	5450.06 (93.07)	5834.57 (92.96)	5263.94 (94.77)	5204.36 (92.68)
Imputed family labour wages	505.58 (10.59)	405.65 (6.93)	441.75 (7.04)	290.64 (5.23)	410.91 (7.32)
Cost C	4774.90 (100.00)	5855.71 (100.00)	6276.32 (100.00)	5554.58 (100.00)	5615.26 (100.00)

Figures in parenthesis are percentages to total

Table 35. Per hectare yield and income at different costs from HYV paddy in puncha season - holding size groups

Particulars	Smallest	Small	Medium	Large	Average
Quantity of grain (kg)	3481.16	3580.00	3620.00	3535.34	3554.13
Quantity of byproduct (bundles)	1770.00	1950.00	1800.00	1850.00	1842.50
Value of grain (Rs)	5855.00	5527.45	5885.00	5468.75	5684.05
Value of byproduct (Rs)	1770.00	1950.00	1800.00	1850.00	1842.50
Gross value (Rs)	7625.00	7477.45	7685.00	7318.75	7526.55
Farm business income (Rs)	3577.78	4089.16	4375.89	3923.64	3991.61
Family labour income (Rs)	1880.18	2406.35	2658.72	2343.54	2322.19
Net income (Rs)	1356.47	2015.50	2368.08	1905.12	1911.29
Benefit cost ratio at Cost A	1.882	2.207	2.322	2.156	2.129
Cost B	1.327	1.475	1.529	1.471	1.446
Cost C	1.216	1.369	1.445	1.352	1.340
Cost/quintal of grain at cost C (Rs)	129.23	98.10	97.15	100.80	106.15

Table 36. Per hectare yield and income at different costs from HYV paddy in puncha season - income groups.

Particulars	Lowest	Lower	Middle	High	Average
Quantity of grain (kg)	3267.50	3705.00	3620.00	3624.00	3554.13
Quantity of byproducts (bundles)	1760.00	1900.00	1810.00	1900.00	1842.50
Value of grain (Rs)	4540.25	6239.00	6077.65	5880.00	5684.05
Value of byproducts (Rs)	1760.00	1900.00	1810.00	1900.00	1842.50
Gross value (Rs)	6300.25	8139.00	7887.65	7780.00	7526.55
Farm business income (Rs)	3427.97	4491.95	3814.31	4232.60	3991.61
Family labour income (Rs)	2030.93	2688.94	2053.08	2516.06	2322.19
Net income (Rs)	1525.35	2283.29	1611.33	2225.42	1911.29
Benefit cost ratio at Cost A	2.194	2.232	1.936	2.193	2.129
Cost B	1.476	1.493	1.352	1.478	1.446
Cost C	1.319	1.390	1.257	1.401	1.340
Cost/quintal of grain at cost C (Rs)	92.27	106.77	123.38	100.84	106.15

Table 37. Inputwise cost of cultivation per hectare of TV paddy in puncha season - holding size groups (Figures in Rs)

Particulars	Smallest	Small	Medium	Large	Average
Hired human labour	1348.52 (27.07)	1273.56 (25.96)	1218.37 (27.63)	1413.92 (28.98)	1313.59 (27.41)
Bullock labour/ Tractor	278.66 (5.59)	418.51 (8.53)	292.37 (6.63)	354.93 (7.28)	336.12 (7.01)
Seeds	226.10 (4.54)	247.34 (5.04)	221.40 (5.02)	241.04 (4.94)	233.97 (4.88)
Manures	339.47 (6.81)	228.12 (4.65)	255.84 (5.80)	423.60 (8.68)	311.76 (6.50)
Fertilizers	455.53 (9.14)	476.90 (9.72)	385.17 (8.73)	486.66 (9.98)	451.07 (9.41)
Pesticides	9.50 (0.20)	24.35 (0.52)	15.85 (0.37)	23.81 (0.49)	18.38 (0.38)
Irrigation (pumpset)	61.74 (1.24)	229.01 (4.67)	115.64 (2.62)	73.35 (1.50)	119.94 (2.50)
Miscellaneous	36.53 (0.73)	50.73 (1.03)	48.48 (1.10)	62.73 (1.29)	49.62 (1.04)
Depreciation on implements	130.23 (2.61)	115.98 (2.36)	98.23 (2.23)	62.42 (1.28)	101.72 (2.12)
Interest on working capital	115.45 (2.32)	122.58 (2.50)	106.05 (2.40)	125.70 (2.58)	117.45 (2.45)
Cost A	3001.73 (60.25)	3187.08 (64.98)	2757.40 (62.53)	3268.15 (67.00)	3053.59 (63.70)
Rental value of own land	1400.20 (28.10)	1405.60 (28.66)	1359.96 (30.84)	1423.34 (29.18)	1397.28 (29.15)
Interest on fixed capital	72.60 (1.46)	67.32 (1.37)	60.17 (1.36)	36.35 (0.75)	59.11 (1.23)
Cost B	4474.53 (89.81)	4660.00 (95.01)	4177.53 (94.73)	4727.84 (96.93)	4509.98 (94.08)
Imputed family labour wages	507.92 (10.19)	244.80 (4.99)	232.18 (5.27)	149.95 (3.07)	283.71 (5.92)
Cost C	4982.45 (100.00)	4904.80 (100.00)	4409.71 (100.00)	4877.79 (100.00)	4793.69 (100.00)

Figures in parenthesis are percentages to total

Table 38. Operationwise cost of cultivation per hectare of TV paddy in puncha season - holding size groups (Figures in Rs)

Particulars	Smallest	Small	Medium	Large	Average
Preparatory cultivation	560.15 (11.24)	518.92 (10.58)	378.25 (8.58)	483.38 (9.91)	485.18 (10.12)
Seeds and sowing	274.05 (5.50)	283.11 (5.77)	263.46 (5.97)	288.64 (5.92)	277.32 (5.79)
Weeding	327.46 (6.57)	282.39 (5.76)	261.90 (5.94)	301.40 (6.18)	293.29 (6.12)
Plant protection	27.71 (0.56)	42.92 (0.89)	34.90 (0.80)	50.76 (1.03)	39.07 (0.81)
Manures and application	401.55 (8.06)	286.02 (5.83)	307.47 (6.97)	491.38 (10.07)	371.61 (7.75)
Fertilizers and application	495.02 (9.94)	498.45 (10.16)	421.70 (9.56)	519.62 (10.65)	483.70 (10.09)
Irrigation	340.50 (6.83)	419.54 (8.55)	265.13 (6.01)	227.58 (4.67)	313.19 (6.53)
Harvesting etc.	801.00 (16.08)	811.30 (16.54)	804.01 (18.24)	804.50 (16.49)	805.20 (16.80)
Miscellaneous	36.53 (0.73)	50.73 (1.03)	48.48 (1.10)	62.73 (1.29)	49.62 (1.04)
Depreciation on implements	130.23 (2.61)	115.98 (2.36)	98.23 (2.23)	62.42 (1.28)	101.72 (2.12)
Interest on working capital	115.45 (2.32)	122.58 (2.50)	106.05 (2.40)	125.70 (2.58)	117.45 (2.45)
Less family wages	507.92	244.80	232.18	149.95	283.71
Cost A	3001.73 (60.25)	3187.08 (64.98)	2757.40 (62.53)	3268.15 (67.00)	3053.59 (63.70)
Rental value of own land	1400.20 (28.10)	1405.60 (28.66)	1359.96 (30.84)	1423.34 (29.18)	1397.28 (29.15)
Interest on fixed capital	72.60 (1.46)	67.32 (1.37)	60.17 (1.36)	36.35 (0.75)	59.11 (1.23)
Cost B	4474.53 (89.81)	4660.00 (95.01)	4177.53 (94.73)	4727.84 (96.93)	4509.98 (94.08)
Imputed family labour wages	507.92 (10.19)	244.80 (4.99)	232.18 (5.27)	149.95 (3.07)	283.71 (5.92)
Cost C	4982.45 (100.00)	4904.80 (100.00)	4409.71 (100.00)	4877.79 (100.00)	4793.69 (100.00)

Figures in parenthesis are percentages to total

Table 39. Inputwise cost of cultivation per hectare of TV paddy in puncha season - income groups (Figures in Rs)

Particulars	Lowest	Lower	Middle	High	Average
Hired human labour	1286.91 (25.67)	1293.11 (27.24)	1225.04 (27.63)	1449.31 (29.11)	1313.59 (27.41)
Bullock labour/ Tractor	304.00 (6.06)	349.03 (7.35)	350.80 (7.91)	340.60 (6.84)	336.12 (7.01)
Seeds	231.16 (4.61)	234.19 (4.93)	235.22 (5.30)	235.31 (4.73)	233.97 (4.88)
Manures	267.89 (5.34)	287.33 (6.05)	250.95 (5.66)	440.86 (8.85)	311.76 (6.50)
Fertilizers	461.69 (9.21)	440.42 (9.29)	374.67 (8.45)	527.54 (10.59)	451.07 (9.41)
Pesticides	16.47 (0.34)	13.56 (0.30)	17.98 (0.40)	25.50 (0.51)	18.38 (0.38)
Irrigation (pumpset)	175.18 (3.49)	117.27 (2.47)	133.46 (3.01)	53.87 (1.08)	119.94 (2.50)
Miscellaneous	38.29 (0.76)	49.80 (1.05)	46.10 (1.04)	64.28 (1.29)	49.62 (1.04)
Depreciation on implements	116.02 (2.31)	101.60 (2.14)	95.58 (2.16)	93.67 (1.88)	101.72 (2.12)
Interest on working capital	115.90 (2.31)	115.45 (2.43)	109.19 (2.46)	129.24 (2.60)	117.45 (2.45)
Cost A	3013.51 (60.10)	3001.76 (63.25)	2838.99 (64.02)	3360.18 (67.48)	3053.59 (63.70)
Rental value of own land	1404.40 (28.01)	1436.54 (30.27)	1331.20 (30.01)	1416.96 (28.46)	1397.28 (29.15)
Interest on fixed capital	56.99 (1.13)	55.21 (1.16)	63.70 (1.44)	60.54 (1.21)	59.11 (1.23)
Cost B	4474.90 (89.24)	4493.51 (94.68)	4233.89 (95,47)	4837.68 (97.15)	4509.98 (94.08)
Imputed family labour wages	539.59 (10.76)	252.58 (5.32)	200.98 (4.53)	141.70 (2.85)	283.71 (5.92)
Cost C	5014.49 (100.00)	4746.09 (100.00)	4434.87 (100.00)	4979.38 (100.00)	4793.69 (100.00)

Figures in parenthesis are percentages to total

Table 40. Operationwise cost of cultivation per hectare of TV paddy in puncha season - income groups (Figures in Rs)

Particulars	Lowest	Lower	Middle	High	Average
Preparatory cultivation	543.40 (10.84)	468.38 (9.87)	443.72 (10.01)	485.20 (9.74)	485.18 (10.12)
Seeds and sowing	278.19 (5.55)	280.26 (5.91)	268.35 (6.05)	282.46 (5.67)	277.32 (5.79)
Weeding	324.00 (6.46)	289.48 (6.10)	279.70 (6.31)	279.97 (5.62)	293.29 (6.12)
Plant protection	35.85 (0.71)	30.07 (0.64)	35.59 (0.80)	54.78 (1.11)	39.07 (0.81)
Manures and application	332.21 (6.63)	340.43 (7.17)	297.31 (6.70)	516.47 (10.37)	371.61 (7.75)
Fertilizer and application	495.75 (9.89)	474.26 (9.99)	403.74 (9.10)	561.04 (11.27)	483.70 (10.09)
Irrigation	462.84 (9.23)	307.03 (6.47)	292.67 (6.60)	190.21 (3.82)	313.19 (6.53)
Harvesting etc.	810.65 (16.17)	797.58 (16.80)	768.02 (17.32)	844.56 (16.96)	805.20 (16.80)
Miscellaneous	38.29 (0.76)	49.80 (1.05)	46.10 (1.04)	64.28 (1.29)	49.62 (1.04)
Depreciation on implements	116.02 (2.31)	101.60 (2.14)	95.58 (2.16)	93.67 (1.88)	101.72 (2.12)
Interest on working capital	115.90 (2.31)	115.45 (2.43)	109.19 (2.46)	129.24 (2.60)	117.45 (2.45)
Less family wages	539.59	252.58	200.98	141.70	283.71
Cost A	3013.51 (60.10)	3001.76 (63.25)	2838.99 (64.02)	3360.18 (67.48)	3053.59 (63.70)
Rental value of own land	1404.40 (28.01)	1436.54 (30.27)	1331.20 (30.01)	1416.96 (28.46)	1397.28 (29.15)
Interest on fixed capital	56.99 (1.13)	55.21 (1.16)	63.70 (1.44)	60.54 (1.21)	59.11 (1.23)
Cost B	4474.90 (89.24)	4493.51 (94.68)	4233.89 (95.47)	4837.68 (97.15)	4509.98 (94.08)
Imputed family labour wages	539.59 (10.76)	252.58 (5.32)	200.98 (4.53)	141.70 (2.85)	283.71 (5.92)
Cost C	5014.49 (100.00)	4746.09 (100.00)	4434.87 (100.00)	4979.38 (100.00)	4793.69 (100.00)

Figures in parenthesis are percentages to total

Table 41. Per hectare yield and income at different costsfrom TV paddy in puncha season - holding size groups

Particulars	Smallest	Small	Medium	Large	Average
Quantity of grain (kg)	2755.00	2775.00	2785.00	2806.00	2780.25
Quantity of byproducts (bundles)	1705.00	1605.00	1755.00	1735.00	1700.00
Value of grain (Rs)	4496.00	4623.02	4244.80	4581.68	4486.38
Value of byproducts (Rs)	1705.00	1605.00	1755.00	1735.00	1700.00
Gross value (Rs)	6201.00	6228.02	5999.80	6316.68	6186.38
Farm business income (Rs)	3199.27	3040.94	3242.40	3048.53	3132.79
Family labour income (Rs)	1726.47	1568.02	1822.27	1588.84	1676.40
Net income (Rs)	1218.55	1323.22	1590.09	1438.89	1392.69
Benefit cost ratio at Cost A	2.066	1.954.	2.176	1.933	2.026
Cost B	1.386	1.336	1.436	1.336	1.372
Cost C	1.245	1.270	1.361	1.295	1.291
Cost/quintal of grain at cost C (Rs)	118.96	118.91	95.32	112.00	111.27

Table 42. Per hectare yield and income at different costs from TV paddy in puncha season - income groups

Particulars	Lowest	Lower	Middle	High	Average
Quantity of grain (kg)	2724.00	2729.00	2766.00	2894.00	2780.25
Quantity of byproducts(bundles)	1735.00	1585.00	1755.00	1725.00	1700.00
Value of grain (Rs)	4487.00	4797.70	4101.00	4559.80	4486.38
Value of byproducts(Rs)	1735.00	1585.00	1755.00	1725.00	1700.00
Gross value (Rs)	6222.00	6382.70	5856.00	6284.80	6186.38
Farm business income (Rs)	3208.49	3380.94	3017.01	2924.62	3132.79
Family labour income (Rs)	1747.10	1889.19	1622.11	1447.12	1676.40
Net income (Rs)	1207.51	1636.61	1421.13	1305.42	1392.69
Benefit cost ratio at Cost A	2.065	2.126	2.063	1.870	2.026
Cost B	1.390	1.420	1.383	1.299	1.372
Cost C	.241	1.345	1.320	1.262	1.290
Cost/quintal of paddy at cost C (Rs)	120.39	115.83	96.89	112.45	111.27

Table 43. Fertilizer use in holding size groups and income groups for banana (Figures in gram/plant)

Fertilizer	Recommended	Holding size groups				
		Smallest	Small	Medium	Large	Average
N	190	56.63	67.94	71.50	62.10	64.54
P	115	20.82	32.28	36.47	40.99	32.64
K	300	28.73	35.48	55.81	47.65	41.92

Fertilizer	Recommended	Income groups				
		Lowest	Lower	Middle	High	Average
N	190	56.70	65.57	65.83	70.07	64.54
P	115	24.55	35.17	33.82	37.02	32.64
K	300	40.33	46.35	29.69	51.30	41.92

Table 44. Utilization of labour per hectare in holding size groups and income groups for banana (Figures in hrs.)

	Family		Hired		Total	
	Male	Female	Male	Female	Male	Female
Holding size groups						
Smallest	1515.00	625.20	753.29	97.27	2268.29	722.47
Small	1019.97	395.90	1128.33	150.87	2148.30	546.77
Medium	738.73	197.56	1383.30	194.48	2122.03	392.04
Large	502.00	128.40	1606.19	284.86	2108.19	413.26
Average	943.93	336.77	1217.78	181.87	2161.71	518.64
Income groups						
Lowest	1641.40	701.00	639.40	68.40	2280.80	769.40
Lower	1046.70	327.00	1014.30	160.40	2061.00	487.40
Middle	648.40	219.40	1501.30	210.72	2149.70	430.12
High	439.20	99.66	1716.11	287.96	2156.31	387.62
Average	943.93	336.77	1217.78	181.87	2161.71	518.64

Table 45. Inputwise cost of cultivation of banana per hectare in holding size groups (Figures in Rs)

Particulars	Smallest	Small	Medium	Large	Average
Hired human labour	2029.00 (5.83)	3188.25 (9.22)	3580.25 (10.34)	4291.00 (12.56)	3272.13 (9.47)
Suckers	2708.25 (7.78)	2850.00 (8.24)	2664.00 (7.69)	2694.50 (7.89)	2729.19 (7.90)
Manures	3501.00 (10.05)	3315.75 (9.58)	2498.50 (7.21)	2396.75 (7.02)	2928.00 (8.47)
Fertilizers	1348.00 (3.87)	1845.25 (5.33)	2182.50 (6.30)	1886.00 (5.52)	1815.44 (5.25)
Pesticides	112.25 (0.32)	188.75 (0.55)	223.25 (0.64)	301.25 (0.88)	206.38 (0.60)
Bamboos (Support)	8213.50 (23.58)	7432.25 (21.48)	7712.25 (22.27)	8464.25 (24.78)	7955.56 (23.02)
Irrigation (Pumpset)	656.75 (1.89)	498.25 (1.44)	477.50 (1.38)	295.75 (0.87)	482.06 (1.40)
Miscellaneous	311.75 (0.90)	355.50 (1.03)	308.50 (0.89)	314.25 (0.92)	322.50 (0.93)
Depreciation on implements	130.23 (0.37)	115.99 (0.34)	98.23 (0.28)	62.42 (0.18)	101.72 (0.29)
Interest on working capital	2281.28 (6.55)	2374.80 (6.86)	2369.40	.74 7)	2377.56 (6.88)
Cost A	21292			1)	22190.54 (64.22)
Rent				5	9396.49 (27.19)
					59.11 (0.17)
					31646.14 (91.58)
					2908.81 (8.42)
					54.95 .00)

Table 46. Operationwise cost of cultivation of banana per hectare in holding size groups (Figures in Rs)

Particulars	Smallest	Small	Medium	Large	Average
Digging pits	1444.00 (4.15)	1557.25 (4.50)	1582.00 (4.57)	1625.75 (4.76)	1552.25 (4.49)
Planting	3341.75 (9.59)	3426.50 (9.90)	3119.25 (9.01)	3167.50 (9.27)	3263.75 (9.45)
Weeding	1008.75 (2.90)	1191.75 (3.44)	1131.00 (3.27)	1175.75 (3.44)	1126.81 (3.26)
Plant protection	216.75 (0.62)	342.50 (0.99)	453.50 (1.31)	503.50 (1.47)	379.06 (1.10)
Manures and application	4186.25 (12.02)	4162.00 (12.03)	3248.75 (9.38)	2954.00 (8.65)	3637.75 (10.53)
Fertilizers and application	1661.75 (4.77)	2215.25 (6.40)	2467.25 (7.12)	2169.25 (6.35)	2128.38 (6.16)
Irrigation	2471.25 (7.10)	1653.25 (4.78)	1317.00 (3.80)	1024.25 (3.00)	1616.44 (4.68)
Supporting	8464.75 (24.30)	7847.50 (22.68)	7878.25 (22.75)	8745.25 (25.60)	8233.94 (23.83)
Harvesting	309.75 (0.89)	321.75 (0.93)	330.50 (0.95)	474.75 (1.39)	359.19 (1.04)
Miscellaneous	311.75 (0.90)	355.50 (1.03)	308.50 (0.89)	314.25 (0.92)	322.50 (0.93)
Depreciation on implements	130.23 (0.37)	115.99 (0.34)	98.23 (0.28)	62.42 (0.18)	101.72 (0.29)
Interest on working capital	2281.28 (6.55)	2374.80 (6.86)	2369.40 (6.84)	2484.74 (7.27)	2377.56 (6.88)
Less family wages	4536.25	3399.25	2189.25	1510.50	2908.81
Cost A	21292.01 (61.13)	22164.79 (64.07)	22114.38 (63.85)	23190.91 (67.88)	22190.54 (64.22)
Rental value of own land	8928.25 (25.63)	8962.90 (25.91)	10269.55 (29.65)	9425.25 (27.59)	9396.49 (27.19)
Interest on fixed capital	72.60 (0.21)	67.32 (0.19)	60.17 (0.17)	36.35 (0.11)	59.11 (0.17)
Cost B	30292.86 (86.98)	31195.01 (90.17)	32444.10 (93.68)	32652.51 (95.58)	31646,14 (91.58)
Imputed family labour wages	4536.25 (13.02)	3399.25 (9.83)	2189.25 (6.32)	1510.50 (4.42)	2908.81 (8.42)
Cost C	34829.11 (100.00)	34594.26 (100.00)	34633.35 (100.00)	34163.01 (100.00)	34554.95 (100.00)

Figures in parenthesis are percentages to total

Table 47. Inputwise cost of cultivation of banana per hectare in income groups (Figures in Rs)

Particulars	Lowest	Lower	Middle	High	Average
Hired human labour	2239.50 (6.33)	3201.75 (9.44)	3219.25 (9.19)	4428.00 (13.06)	3272.13 (9.47)
Suckers	2644.50 (7.48)	2790.25 (8.23)	2915.00 (8.32)	2567.00 (7.57)	2729.19 (7.90)
Manures	3832.25 (10.84)	2868.00 (8.46)	2783.50 (7.94)	2228.25 (6.57)	2928.00 (8.47)
Fertilizers	1520.50 (4.30)	1896.50 (5.59)	1772.25 (5.06)	2072.50 (6.11)	1815.44 (5.25)
Pesticides	191.50 (0.54)	102.75 (0.30)	230.25 (0.66)	301.00 (0.89)	206.38 (0.60)
Bamboos (Support)	7724.75 (21.84)	7637.00 (22.53)	8191.25 (23.38)	8269.25 (24.38)	7955.56 (23.02)
Irrigation (Pumpset)	684.50 (1.94)	363.00 (1.07)	552.50 (1.58)	328.25 (0.97)	482.06 (1.40)
Miscellaneous	352.00 (1.00)	312.50 (0.92)	338.75 (0.97)	286.75 (0.85)	322.50 (0.93)
Depreciation on implements	116.02 (0.33)	101.60 (0.30)	95.58 (0.27)	93.67 (0.28)	101.72 (0.29)
Interest on working capital	2316.66 (6.55)	2312.80 (6.82)	2411.80 (6.88)	2468.96 (7.28)	2377.56 (6.88)
Cost A	21622.18 (61.14)	21586.15 (63.68)	22510.13 (64.25)	23043.63 (67.94)	22190.54 (64.22)
Rental value of own land	9071.75 (25.65)	9127.60 (26.93)	9509.80 (27.14)	9876.80 (29.12)	9396.49 (27.19)
Interest on fixed capital	56.99 (0.16)	55.21 (0.16)	63.70 (0.18)	60.54 (0.18)	59.11 (0.17)
Cost B	30750.92 (86.95)	30768.96 (90.76)	32083.63 (91.57)	32980.97 (97.24)	31646.14 (91.58)
Imputed family labour wages	4617.00 (13.05)	3130.75 (9.24)	2953.00 (8.43)	934.50 (2.76)	2908.81 (8.42)
Cost C	35367.92 (100.00)	33899.71 (100.00)	35036.63 (100.00)	33915.47 (100.00)	34554.95 (100.00)

Figures in parenthesis are percentages to total

Table 45. Inputwise cost of cultivation of banana per hectare 'n holding size groups (Figures in Rs)

Particulars	Smallest	Small	Medium	Large	Average
Hired human labour	2029.00 (5.83)	3188.25 (9.22)	3580.25 (10.34)	4291.00 (12.56)	3272.13 (9.47)
Suckers	2708.25 (7.78)	2850.00 (8.24)	2664.00 (7.69)	2694.50 (7.89)	2729.19 (7.90)
Manures	3501.00 (10.05)	3315.75 (9.58)	2498.50 (7.21)	2396.75 (7.02)	2928.00 (8.47)
Fertilizers	1348.00 (3.87)	1845.25 (5.33)	2182.50 (6.30)	1886.00 (5.52)	1815.44 (5.25)
Pesticides	112.25 (0.32)	188.75 (0.55)	223.25 (0.64)	301.25 (0.88)	206.38 (0.60)
Bamboos (Support)	8213.50 (23.58)	7432.25 (21.48)	7712.25 (22.27)	8464.25 (24.78)	7955.56 (23.02)
Irrigation (Pumpset)	656.75 (1.89)	498.25 (1.44)	477.50 (1.38)	295.75 (0.87)	482.06 (1.40)
Miscellaneous	311.75 (0.90)	355.50 (1.03)	308.50 (0.89)	314.25 (0.92)	322.50 (0.93)
Depreciation on implements	130.23 (0.37)	115.99 (0.34)	98.23 (0.28)	62.42 (0.18)	101.72 (0.29)
Interest on working capital	2281.28 (6.55)	2374.80 (6.86)	2369.40 (6.84)	2484.74 (7.27)	2377.56 (6.88)
Cost A	21292.01 (61.13)	22164.79 (64.07)	22114.38 (63.85)	23190.91 (67.88)	22190.54 (64.22)
Rental value of own land	8928.25 (25.63)	2962.90 (25.91)	10269.55 (29.65)	9425.25 (27.59)	9396.49 (27.19)
Interest on fixed capital	72.60 (0.21)	67.32 (0.19)	60.17 (0.17)	36.35 (0.11)	59.11 (0.17)
Cost B	30292.86 (86.98)	31195.01 (90.17)	32444.10 (93.68)	32652.51 (95.58)	31646.14 (91.58)
Imputed family labour wages	4536.25 (13.02)	3399.25 (9.83)	2189.25 (6.32)	1510.50 (4.42)	2908.81 (8.42)
Cost C	34829.11 (100.00)	34594.26 (100.00)	34633.35 (100.00)	34163.01 (100.00)	34554.95 (100.00)

Figures in parenthesis are percentages to total

Table 46. Operationwise cost of cultivation of banana per hectare in holding size groups (Figures in Rs)

Particulars	Smallest	Small	Medium	Large	Average
Digging pits	1444.00 (4.15)	1557.25 (4.50)	1582.00 (4.57)	1625.75 (4.76)	1552.25 (4.49)
Planting	3341.75 (9.59)	3426.50 (9.90)	3119.25 (9.01)	3167.50 (9.27)	3263.75 (9.45)
Weeding	1008.75 (2.90)	1191.75 (3.44)	1131.00 (3.27)	1175.75 (3.44)	1126.81 (3.26)
Plant protection	216.75 (0.62)	342.50 (0.99)	453.50 (1.31)	503.50 (1.47)	379.06 (1.10)
Manures and application	4186.25 (12.02)	4162.00 (12.03)	3248.75 (9.38)	2954.00 (8.65)	3637.75 (10.53)
Fertilizers and application	661.75 4.77)	2215.25 (6.40)	2467.25 (7.12)	2169.25 (6.35)	2128.38 (6.16)
Irrigation	471.25 7.10)	1653.25 (4.78)	1317.00 (3.80)	1024.25 (3.00)	1616.44 (4.68)
Supporting	8464.75 24.30)	7847.50 (22.68)	7878.25 (22.75)	8745.25 (25.60)	8233.94 (23.83)
Harvesting	309.75 (0.89)	321.75 (0.93)	330.50 (0.95)	474.75 (1.39)	359.19 (1.04)
Miscellaneous	311.75 (0.90)	355.50 (1.03)	308.50 (0.89)	314.25 (0.92)	322.50 (0.93)
Depreciation on implements	130.23 (0.37)	115.99 (0.34)	98.23 (0.28)	62.42 (0.18)	101.72 (0.29)
Interest on working capital	2281.28 (6.55)	2374.80 (6.86)	2369.40 (6.84)	2484.74 (7.27)	2377.56 (6.88)
Less family wages	4536.25	3399.25	2189.25	1510.50	2908.81
Cost A	21292.01 (61.13)	22164.79 (64.07)	22114.38 (63.85)	23190.91 (67.88)	22190.54 (64.22)
Rental value of own land	8928.25 (25.63)	8962.90 (25.91)	10269.55 (29.65)	9425.25 (27.59)	9396.49 (27.19)
Interest on fixed capital	72.60 (0.21)	67.32 (0.19)	60.17 (0.17)	36.35 (0.11)	59.11 (0.17)
Cost B	30292.86 (86.98)	31195.01 (90.17)	32444.10 (93.68)	32652.51 (95.58)	31646.14 (91.58)
Imputed family labour wages	4536.25 (13.02)	3399.25 (9.83)	2189.25 (6.32)	1510.50 (4.42)	2908.81 (8.42)
Cost C	34829.11 (100.00)	34594.26 (100.00)	34633.35 (100.00)	34163.01 (100.00)	34554.95 (100.00)

Figures in parenthesis are percentages to total

Table 47. Inputwise cost of cultivation of banana per hectare in income groups (Figures in Rs)

Particulars	Lowest	Lower	Middle	High	Average
Hired human labour	2239.50 (6.33)	3201.75 (9.44)	3219.25 (9.19)	4428.00 (13.06)	3272.13 (9.47)
Suckers	2644.50 (7.48)	2790.25 (8.23)	2915.00 (8.32)	2567.00 (7.57)	2729.19 (7.90)
Manures	3832.25 (10.84)	2868.00 (8.46)	2783.50 (7.94)	2228.25 (6.57)	2928.00 (8.47)
Fertilizers	1520.50 (4.30)	1896.50 (5.59)	1772.25 (5.06)	2072.50 (6.11)	1815.44 (5.25)
Pesticides	191.50 (0.54)	102.75 (0.30)	230.25 (0.66)	301.00 (0.89)	206.38 (0.60)
Bamboos (Support)	7724.75 (21.84)	7637.00 (22.53)	8191.25 (23.38)	8269.25 (24.38)	7955.56 (23.02)
Irrigation (Pumpset)	684.50 (1.94)	363.00 (1.07)	552.50 (1.58)	328.25 (0.97)	482.06 (1.40)
Miscellaneous	352.00 (1.00)	312.50 (0.92)	338.75 (0.97)	286.75 (0.85)	322.50 (0.93)
Depreciation on implements	116.02 (0.33)	101.60 (0.30)	95.58 (0.27)	93.67 (0.28)	101.72 (0.29)
Interest on working capital	2316.66 (6.55)	2312.80 (6.82)	2411.80 (6.88)	2468.96 (7.28)	2377.56 (6.88)
Cost A	21622.18 (61.14)	21586.15 (63.68)	22510.13 (64.25)	23043.63 (67.94)	22190.54 (64.22)
Rental value of own land	9071.75 (25.65)	9127.60 (26.93)	9509.80 (27.14)	9876.80 (29.12)	9396.49 (27.19)
Interest on fixed capital	56.99 (0.16)	55.21 (0.16)	63.70 (0.18)	60.54 (0.18)	59.11 (0.17)
Cost B	30750.92 (86.95)	30768.96 (90.76)	32083.63 (91.57)	32980.97 (97.24)	31646.14 (91.58)
Imputed family labour wages	4617.00 (13.05)	3130.75 (9.24)	2953.00 (8.43)	934.50 (2.76)	2908.81 (8.42)
Cost C	35367.92 (100.00)	33899.71 (100.00)	35036.63 (100.00)	33915.47 (100.00)	34554.95 (100.00)

Figures in parenthesis are percentages to total

Table 48. Operationwise cost of cultivation of banana per hectare in income groups (Figures in Rs)

Particulars	Lowest	Lower	Middle	High	Average
Digging pits	1483.75 (4.20)	1520.50 (4.49)	1521.25 (4.34)	1683.50 (4.96)	1552.25 (4.49)
Planting	3304.25 (9.34)	3320.00 (9.79)	3456.50 (9.87)	2974.25 (8.77)	3263.75 (9.45)
Weeding	1112.00 (3.14)	1201.75 (3.55)	1071.50 (3.06)	1122.00 (3.31)	1126.81 (3.26)
Plant protection	319.75 (0.90)	204.00 (0.60)	454.25 (1.30)	538.25 (1.59)	379.06 (1.10)
Manures and application	4580.00 (12.95)	3504.50 (10.34)	3639.00 (10.39)	2827.50 (8.34)	3637.75 (10.53)
Fertilizers and application	1825.50 (5.16)	2230.00 (6.58)	2103.75 (6.00)	2354.25 (6.94)	2128.38 (6.16)
Irrigation	2448.25 (6.92)	1669.00 (4.92)	1483.50 (4.23)	865.00 (2.55)	1616.44 (4.68)
Supporting	7970.75 (22.54)	7960.75 (23.48)	8484.00 (24.21)	8520.25 (25.12)	8233.94 (23.83)
Harvesting	410.25 (1.16)	379.50 (1.12)	403.25 (1.15)	243.75 (0.72)	359.19 (1.04)
Miscellaneous	352.00 (1.00)	312.50 (0.92)	338.75 (0.97)	286.75 (0.85)	322.50 (0.93)
Depreciation on implements	116.02 (0.33)	101.60 (0.30)	95.58 (0.27)	93.67 (0.28)	101.72 (0.29)
Interest on working capital	2316.66 (6.55)	2312.80 (6.82)	2411.80 (6.88)	2468.96 (7.28)	2377.56 (6.88)
Less family wages	4617.00	3130.75	2953.00	934.50	2908.81
Cost A	21622.18 (61.14)	21586.15 (63.38)	22510.13 (64.25)	23043.63 (67.94)	22190.54 (64.22)
Rental value of own land	9071.75 (25.65)	9127.60 (26.93)	9509.80 (27.14)	9876.80 (29.12)	9396.49 (27.19)
Interest on fixed capital	56.99 (0.16)	55.21 (0.16)	63.70 (0.18)	60.54 (0.18)	59.11 (0.17)
Cost B	30750.92 (86.95)	30768.96 (90.76)	32083.63 (91.57)	32980.97 (97.24)	31646.14 (91.58)
Imputed family labour wages	4617.00 (13.05)	3130.75 (9.24)	2953.00 (8.43)	934.50 (2.76)	2908.81 (8.42)
Cost C	35367.92 (100.00)	33899.71 (100.00)	35036.63 (100.00)	33915.47 (100.00)	34554.95 (100.00)

Figures in parenthesis are percentages to total

Table 49. Per hectare yield and income at different costs from banana in holding size groups

Particulars	Smallest	Small	Medium	Large	Average
Yield (kg)	15893.00	16171.00	16950.00	16252.00	16316.50
Gross returns (Rs)	44641.25	44814.50	51347.75	47126.25	46982.44
Farm business income (Rs)	23349.24	22649.71	29233.37	23935.34	24791.90
Family labour income (Rs)	14348.39	13619.49	18903.65	14473.74	15336.30
Net income (Rs)	9812.14	10220.24	16714.40	12963.24	12427.49
Income at cost C excluding rental value of land(Rs)	18740.39	19183.14	26983.95	22388.49	21823.99
Benefit cost ratio at Cost A	2.100	2.022	2.322	2.032	2.117
Cost B	1.474	1.437	1.583	1.443	1.485
Cost C	1.282	1.295	1.483	1.379	1.360
Cost C excluding rental value of land	1.724	1.748	2.108	1.905	1.867
At cost C					
Cost/bunch (Rs)	13.93	13.84	13.85	13.66	13.82
Cost/kg (Rs)	2.19	2.14	2.04	2.10	2.12
At cost C excluding rental value of land:-					
Cost/bunch (Rs)	10.36	10.25	9.74	9.90	10.06
Cost/kg (Rs)	1.63	1.59	1.44	1.52	1.54

Table 50. Per hectare yield and income at different costs from banana in income groups

Particulars	Lowest	Lower	Middle	High	Average
Yield (kg)	16049.00	16152.00	16401.00	16654.00	16316.50
Gross returns (Rs)	45358.75	45638.00	47549.00	49384.00	46982.44
Farm business income (Rs)	23736.57	24051.85	25038.87	26340.37	24791.90
Family labour income (Rs)	14607.83	14869.04	15465.37	16403.03	15336.30
Net income (Rs)	9990.83	11738.29	12512.37	15468.53	12427.49
Income at cost C excluding rental value of land (Rs)	19062.58	20865.89	20022.17	25345.33	21823.99
Benefit cost ratio at Cost A	2.098	2.110	2.112	2.143	2.117
Cost B	1.475	1.480	1.482	1.497	1.485
Cost C	1.282	1.346	1.357	1.456	1.360
Cost C excluding rental value of land	1.725	1.842	1.863	2.054	1.867
At cost C					
Cost/bunch (Rs)	14.15	13.56	14.02	13.57	13.82
Cost/kg (Rs)	2.20	2.09	2.14	2.04	2.12
At cost C excluding rental value of land					
Cost/bunch (Rs)	10.52	9.91	10.21	9.62	10.06
Cost/kg (Rs)	1.64	1.53	1.56	1.44	1.54

Table 51A. Fertilizer application for coconut and arecanut in holding size groups (Figures in gram/palm

Fertilizer	Recommended	Smallest	Small	Medium	Large	Average
Coconut						
N	500	46.80	75.80	105.68	81.95	77.56
P	330	17.09	68.80	81.88	84.67	63.11
K	1200	28.49	87.80	131.11	83.81	82.80
Arecanut						
N	100	17.73	25.93	54.13	24.19	30.50
P	40	17.73	25.93	34.33	24.19	25.55
K	140	41.80	25.93	47.55	24.19	34.87

Table 51B. Fertilizer application for coconut and arecanut in income groups (Figures in gram/palm)

Fertilizer	Recommended	Lowest	Lower	Middle	High	Average
Coconut						
N	500	58.31	89.10	68.80	94.02	77.56
P	330	49.43	73.39	43.24	86.38	63.11
K	1200	59.08	131.80	31.06	109.27	82.80
Arecanut						
N	100	29.70	50.70	11.74	29.84	30.50
P	40	27.75	34.56	11.14	28.73	25.55
K	140	46.20	48.57	14.14	30.56	34.87

Table 52. Utilization of labour per hectare for maintenance of perennial crops (Figures in hrs.)

	Family		Hired		Total	
	Male	Female	Male	Female	Male	Female
Holding size groups						
Coconut						
Smallest	165.00	64.30	241.40	7.09	406.40	71.39
Small	144.00	71.00	301.20	17.00	445.20	88.00
Medium	125.67	55.40	311.11	11.84	436.78	67.24
Large	47.12	16.34	340.31	36.05	387.43	52.39
Average	120.45	51.76	298.51	18.00	418.96	69.76
Arecanut						
Smallest	608.76	177.00	120.40	41.00	729.16	218.00
Small	407.00	121.00	287.14	123.47	694.14	244.47
Medium	293.46	135.39	313.04	43.08	606.50	178.47
Large	229.14	101.00	620.00	163.91	849.14	264.91
Average	384.59	133.60	335.14	92.87	719,74	226.47
Income groups						
Coconut						
Lowest	184.00	69.40	221.30	6.40	405.30	75.80
Lower	139.20	64.25	297.40	14.70	436.60	78.95
Middle	117.80	41.00	309.19	24.20	426.99	65.20
High	40.79	32.39	366.13	26.68	406.92	59.07
Average	120.45	51.76	298.51	18.00	418.96	69.76
Arecanut						
Lowest	704.26	194.30	109.24	42.45	813.50	236.75
Lower	456.12	159.20	294.20	89.24	750.32	248.44
Middle	224.30	117.10	386.45	93.10	610.75	210.20
High	173.68	63.79	550.69	146.67	724.37	210.46
Average	384.59	133.60	335.15	92.87	719.74	226.47

Table 53. Inputwise per hectare maintenance cost of coconut - holding size groups (Figures in Rs)

Particulars	Smallest	Small	Medium	Large	Average
Hired human labour	548.53 (10.76)	832.87 (14.98)	834.47 (15.22)	872.00 (18.95)	771.97 (14.89)
Manures	675.20 (13.25)	625.80 (11.26)	571.60 (10.43)	575.80 (12.51)	612.10 (11.81)
Fertilizers	90.40 (1.77)	244.20 (4.39)	345.00 (6.29)	265.00 (5.76)	236.15 (4.55)
Pesticides	8.47 (0.17)	11.93 (0.21)	14.40 (0.26)	23.60 (0.51)	14.60 (0.28)
Irrigation (Pumpset)	524.60 (10.29)	665.80 (11.98)	537.80 (9.81)	279.80 (6.08)	502.00 (9.68)
Miscellaneous	33.80 (0.66)	43.20 (0.78)	23.00 (0.42)	27.00 (0.59)	31.75 (0.61)
Depreciation on implements	130.23 (2.55)	115.99 (2.09)	98.23 (1.79)	62.42 (1.36)	101.72 (1.96)
Interest on working capital	241.35 (4.73)	304.80 (5.48)	290.94 (5.31)	252.67 (5.49)	272.43 (5.25)
Cost A	2252.58 (44.19)	2844.59 (51.18)	2715.44 (49.53)	2358.29 (51.25)	2542.72 (49.04)
Rental value of own land	2179.97 (42.77)	2192.56 (39.45)	2317.88 (42.28)	2072.11 (45.03)	2190.63 (42.25)
Interest on fixed capital	72.60 (1.42)	67.32 (1.21)	60.17 (1.10)	36.35 (0.79)	59.11 (1.14)
Cost B	4505.15 (88.38)	5104.47 (91.84)	5093.49 (92.91)	4466.75 (97.07)	4792.46 (92.43)
Imputed family labour wages	592.13 (11.62)	453.80 (8.16)	388.80 (7.09)	134.87 (2.93)	392.40 (7.57)
Cost C	5097.28 (100.00)	5558.27 (100.00)	5482.29 (100.00)	4601.62 (100.00)	5184.86 (100.00)

Figures in parenthesis are percentages to total

Table 54. Operationwise per hectare maintenance cost of coconut - holding size groups (Figures in Rs)

Particulars	Smallest	Small	Medium	Large	Average
Weeding	90.13 (1.77)	131.20 (2.36)	120.73 (2.20)	144.60 (2.64)	121.67 (2.36)
Plant protection	9.60 (0.19)	18.80 (0.34)	27.60 (0.50)	51.00 (0.93)	26.75 (0.52)
Manures and application	753.80 (14.79)	768.67 (13.83)	677.33 (12.35)	696.40 (12.70)	724.05 (13.96)
Fertilizers and application	107.20 (2.10)	302.40 (5.44)	398.60 (7.27)	317.67 (5.79)	281.47 (5.43)
Irrigation	814.00 (15.97)	920.93 (16.57)	812.66 (14.82)	487.00 (8.89)	758.65 (14.63)
Harvesting	664.60 (13.04)	692.40 (12.46)	655.13 (11.95)	454.40 (8.29)	616.63 (11.89)
Miscellaneous	33.80 (0.66)	43.20 (0.78)	23.00 (0.42)	27.00 (0.59)	31.75 (0.61)
Depreciation on implements	130.23 (2.55)	115.99 (2.09)	98.23 (1.79)	62.42 (1.36)	101.72 (1.96)
Interest on working capital	241.35 (4.73)	304.80 (5.48)	290.94 (5.31)	252.67 (5.49)	272.43 (5.25)
Less family wages	592.13	453.80	388.80	134.87	392.40
Cost A	2252.58 (44.19)	2844.59 (51.18)	2715.44 (49.53)	2358.29 (51.25)	2542.72 (49.04)
Rental value of own land	2179.97 (42.77)	2192.56 (39.45)	2317.88 (42.28)	2072.11 (45.03)	2190.63 (42.25)
Interest on fixed capital	72.60 (1.42)	67.32 (1.21)	60.17 (1.10)	36.35 (0.79)	59.11 (1.14)
Cost B	4505.15 (88.38)	5104.47 (91.84)	5093.49 (92.91)	4466.75 (97.07)	4792.46 (92.43)
Imputed family labour wages	592.13 (11.62)	453.80 (8.16)	388.80 (7.09)	134.87 (2.93)	392,40 (7.57)
Cost C	5097.28 (100.00)	5558.27 (100.00)	5482.29 (100.00)	4601.62 (100.00)	5184.86 (100.00)

Figures in parenthesis are percentages to total

Table 55. Inputwise per hectare maintenance cost of coconut - income groups (Figures in Rs)

Particulars	Lowest	Lower	Middle	High	Average
Hired human labour	412.60 (8.62)	867.00 (15.13)	892.60 (15.75)	915.68 (20.13)	771.97 (14.89)
Manures	577.40 (12.07)	626.20 (10.93)	790.80 (13.94)	454.00 (9.98)	612.10 (11.81)
Fertilizers	162.40 (3.39)	291.67 (5.09)	163.13 (2.87)	327.40 (7.20)	236.10 (4.55)
Pesticides	12.80 (0.27)	5.60 (0.10)	25.80 (0.45)	14.20 (0.31)	14.60 (0.28)
Irrigation (Pumpset)	539.60 (11.28)	629.00 (10.98)	491.27 (8.66)	348.13 (7.65)	502.00 (9.68)
Miscellaneous	32.20 (0.67)	31.40 (0.55)	45.20 (0.80)	18.20 (0.40)	31.75 (0.61)
Depreciation on implements	116.02 (2.42)	101.60 (1.77)	95.58 (1.68)	93.67 (2.06)	101.72 (1.96)
Interest on working capital	222.36 (4.65)	306.30 (5.35)	300.53 (5.30)	260.55 (5.73)	272.43 (5.25)
Cost A	2075.38 (43.37)	2858.77 (49.89)	2804.91 (49.43)	2431.83 (53.46)	2542.72 (49.04)
Rental value of own land	2008.03 (41.96)	2340.24 (40.84)	2481.80 (43.73)	1932.45 (42.48)	2190.63 (42.25)
Interest on fixed capital	56.99 (1.19)	55.21 (0.96)	63.70 (1.12)	60.54 (1.33)	59.11 (1.14)
CostB	4140.40 (86.53)	5254.22 (91.69)	5350.41 (94.28)	4424.82 (97.27)	4792.46 (92.43)
Imputed family labour wages	644.80 (13.47)	476.00 (8.31)	324.40 (5.72)	124.40 (2.73)	392.40 (7.57)
Cost C	4785.20 (100.00)	5730.22 (100.00)	5674.81 (100.00)	4549.22 (100.00)	5184.86 (100.00)

Figures in parenthesis are percentages to total

Table 56. Operationwise per hectare maintenance cost of coconut - income groups (Figures in Rs)

Particulars	Lowest	Lower	Middle	High	Average
Weeding	93.53 (1.95)	121.80 (2.13)	122.20 (2.15)	149.13 (3.29)	121.67 (2.36)
Plant protection	24.20 (0.51)	13.00 (0.23)	45.20 (0.80)	24.60 (0.54)	26.75 (0.52)
Manures and application	664.47 (13.89)	756.07 (13.19)	933.40 (16.45)	542.24 (11.92)	724.05 (13.96)
Fertilizers and application	195.47 (4.08)	345.00 (6.02)	204.67 (3.61)	380.74 (8.37)	281.47 (5.43)
Irrigation	762.00 (15.92)	936.40 (16.34)	753.13 (13.27)	583.06 (12.82)	758.65 (14.63)
Harvesting	609.93 (12.75)	723.20 (12.62)	629.40 (11.09)	504.00 (11.08)	616.63 (11.89)
Miscellaneous	32.20 (0.67)	31.40 (0.55)	45.20 (0.80)	18.20 (0.40)	31.75 (0.61)
Depreciation on implements	116.02 (2.42)	101.60 (1.77)	95.58 (1.68)	93.67 (2.06)	101.72 (1.96)
Interest on working capital	222.36 (4.65)	306.30 (5.35)	300.53 (5.30)	260.55 (5.73)	272.43 (5.25)
Less family wages	644.80	476.00	324.40	124.40	392.40
Cost A	2075.38 (43.37)	2858.77 (49.89)	2804.91 (49.43)	2431.83 (53.46)	2542.72 (49.04)
Rental value of own land	2008.03 (41.96)	2340.24 (40.84	2481.80 (43.73)	1932.45 (42.48)	2190.63 (42.25)
Interest on fixed capital	56.99 (1.19)	55.21 (0.96)	63.70 (1.12)	60.54 (1.33)	59.11 (1.14)
Cost B	4140.40 (86.53)	5254.22 (91.69)	5350.41 (94.28)	4424.82 (97.27)	4792.46 (92.43)
Imputed family labour wages	644.80 (13.47)	476.00 (8.31)	324.40 (5.72)	124.40 (2.73)	392.40 (7.57)
Cost C	4785.20 (100.00)	5730.22 (100.00)	5674.81 (100.00)	4549.22 (100.00)	5184.86 (100.00)

Figures in parenthesis are percentages to total

Table 57. Yield, returns, income at different costs per hectare from coconut - holding size groups

Particulars	Smallest	Small	Medium	Large	Average
Total nuts (No.)	8316	7494	7941	6930	7670.25
Nuts/palm in bearing	45	48	53	66	53
Value of nuts (Rs)	9563.87	9372.80	10085.40	9001.53	9505.90
Value of byproducts (Rs)	1336.00	1590.00	1504.00	1359.00	1447.25
Gross value (Rs)	10899.87	10962.80	11589.40	10360.53	10953.15
Farm business income	8647.29	8118.21	8873.96	8002.24	8410.43
Family labour income	6394.72	5858.33	6495.91	5893.78	6160.69
Net farm income(Rs)	5802.59	5404.53	6107.11	5758.91	5768.29
Income at cost C excluding rental value of land (Rs)	7982.56	7597.09	8424.99	7831.02	7958.92
Maintenance cost per palm at cost A	11.26	14.22	13.58	11.79	12.71
cost B	22.53	25.52	25.47	22.33	23.96
cost C	25.49	27.79	27.41	23.01	25.92
Cost C excluding rental value of land	14.59	16.83	15.82	12.65	14.97
Cost/100 nuts at Cost A	11.02	16.74	15.26	14.42	14.28
Cost B	38.11	46.90	45.20	44.84	43.61
Cost C	45.23	52.95	50.10	46.79	46.73
Cost C excluding rental value of land	19.02	23.70	20.91	16.89	20.17
Benefit cost ratio at Cost A	4.839	3.854	4.268	4.393	4.308
Cost B	2.419	2.148	2.275	2.319	2.285
Cost C	2.138	1.972	2.114	2.251	2.113
Cost C excluding rental value of land	3.736	3.257	3.662	4.096	3.658

Table 58. Yield, returns and income at different costs per hectare from coconut - income groups

Particulars	Lowest	Lower	Middle	High	Average
Total nuts (No.)	7514	8056	8605	6506	7670.25
Nuts/palm in bearing	44	50	60	58	53
Value of nuts (Rs)	8661.13	10118.20	10848.00	8396.27	9505.90
Value of byproducts (Rs)	1379.00	1583.00	1561.00	1266.00	1447.25
Gross value (Rs)	10040.13	11701.20	12409.00	9662.27	10953.15
Farm business income (Rs)	7964.75	8842.43	9604.09	7230.44	8410.43
Family labour income (Rs)	5899.73	6446.98	7058.59	5237.45	6160.69
Net farm income(Rs)	5254.93	5970.98	6734.19	5113.05	5768.29
Income at cost C excluding rental value of land (Rs)	7262.96	8311.22	9215.99	7045.50	7958.92
Maintenance cost per palm (Rs)					
At cost A	10.38	14.29	14.02	12.16	12.71
Cost B	20.70	26.27	26.75	22.12	23.96
Cost C	23.93	28.65	28.37	22.75	25.92
Cost C excluding rental value of land	13.89	16.95	15.97	13.08	14.97
Cost/100 nuts (Rs)					
at Cost A	9.27	15.84	14.46	17.92	14.28
Cost B	36.75	45.57	44.04	48.55	43.61
Cost C	45.33	51.48	47.81	50.46	48.73
Cost C excluding rental value of land	18.61	22.43	18.97	20.76	20.17
Benefit cost ratio					
at Cost A	4.838	4.093	4.424	3.973	4.308
Cost B	2.425	2.227	2.319	2.184	2.285
Cost C	2.098	2.042	2.187	2.124	2.113
Cost C excluding rental value of land	3.615	3.452	3.886	3.692	3.658

Table 59. Inputwise maintenance cost per hectare of arecanut - holding size groups (Figures in Rs)

Particulars	Smallest	Small	Medium	Large	Average
Hired human labour	694.37 (5.50)	992.75 (8.90)	1047.75 (8.63)	1793.00 (17.15)	1131.97 (9.76)
Pesticides	121.00 (0.96)	151.25 (1.36)	328.25 (2.70)	309.37 (2.96)	227.47 (1.96)
Manures	3071.75 (24.33)	2605.62 (23.37)	2953.50 (24.31)	2323.75 (22.23)	2738.66 (23.62)
Fertilizers	468.87 (3.71)	698.50 (6.26)	918.50 (7.56)	563.75 (5.39)	662.41 (5.71)
Irrigation(Pumpset)	376.75 (2.98)	603.62 (5.41)	518.37 (4.27)	276.37 (2.64)	443.78 (3.83)
Miscellaneous	233.75 (1.85)	299.75 (2.69)	224.12 (1.85)	236.50 (2.26)	248.53 (2.14)
Depreciation on implements	130.23 (1.03)	115.99 (1.04)	98.23 (0.81)	62.42 (0.60)	101.72 (0.88)
Interest on working capital	611.61 (4.84)	656.10 (5.88)	730.65 (6.02)	667.82 (6.39)	666.54 (5.75)
Cost A	5708.33 (45.21)	6123.58 (54.92)	6819.37 (56.14)	6232.98 (59.62)	6221.08 (53.65)
Rental value of own land	3680.32 (29.15)	3592.87 (32.22)	3834.05 (31.56)	3551.62 (33.97)	3664.72 (31.61)
Interest on fixed capital	72.60 (0.57)	67.32 (0.60)	60.17 (0.50)	36.35 (0.35)	59.11 (0.51)
Cost B	9461.25 (74.93)	9783.77 (87.75)	10713.59 (88.20)	9820.95 (93.94)	9944.91 (85.77)
Imputed family labour wages	3165.50 (25.07)	1366.12 (12.25)	1433.50 (11.80)	633.87 (6.06)	1649.75 (14.23)
Cost C	12626.75 (100.00)	11149.89 (100.00)	12147.09 (100.00)	10454.82 (100.00)	11594.66 (100.00)

Figures in parenthesis are percentages to total

Table 60. Operationwise maintenance cost per hectare of arecanut - holding size groups (Figures in Rs)

Particulars	Smallest	Small	Medium	Large	Average
Weeding	867.62 (6.87)	838.75 (7.52)	664.12 (5.47)	695.75 (6.65)	766.56 (6.61)
Plant protection	347.87 (2.76)	390.12 (3.50)	690.25 (5.68)	814.00 (7.79)	560.56 (4.83)
Manures and application	3562.37 (28.21)	3123.37 (28.01)	3571.25 (29.40)	3029.12 (28.97)	3321.53 (28.65)
Fertilizers and application	603.26 (4.78)	900.62 (8.08)	1101.00 (9.06)	669.62 (6.40)	818.63 (7.06)
Irrigation	2517.12 (19.93)	1165.00 (10.45)	1173.25 (9.66)	691.62 (6.62)	1386.75 (11.96)
Miscellaneous	233.75 (1.85)	299.75 (2.69)	224.12 (1.85)	236.50 (2.26)	248.53 (2.14)
Depreciation on implements	130.23 (1.03)	115.99 (1.04)	98.23 (0.81)	62.42 (0.60)	101.72 (0.88)
Interest on working capital	611.61 (4.84)	656.10 (5.88)	730.65 (6.02)	667.82 (6.39)	666.54 (5.75)
Less family wages	3165.50	1366.12	1433.50	633.87	1649.75
Cost A	5708.33 (45.21)	6123.58 (54.92)	6819.37 (56.14)	6232.98 (59.62)	6221.08 (53.65)
Rental value of own land	3680.32 (29.15)	3592.87 (32.22)	3834.05 (31.56)	3551.61 (33.97)	3664.72 (31.61)
Interest on fixed capital	72.60 (0.57)	67.32 (0.60)	60.17 (0.50)	36.35 (0.35)	59.11 (0.51)
Cost B	9461.25 (74.93)	9783.77 (87.75)	10713.59 (88.20)	9820.95 (93.94)	9944.91 (85.77)
Imputed family labour wages	3165.50 (25.07)	1366.12 (12.25)	1433.50 (11.80)	633.87 (6.06)	1649.75 (14.23)
Cost C	12626.75 (100.00)	11149.89 (100.00)	12147.09 (100.00)	10454.82 (100.00)	11594.66 (100.00)

Figures in parenthesis are percentages to total

Table 61. Inputwise maintenance cost per hectare of arecanut - income groups (Figures in Rs)

Particulars	Lowest	Lower	Middle	High	Average
Hired human labour	614.21 (5.09)	1023.21 (5.37)	1331.75 (12.18)	1558.70 (13.98)	1131.97 (9.76)
Pesticides	189.00 (1.57)	234.00 (1.91)	190.00 (1.14)	296.87 (2.66)	227.47 (1.96)
Manures	2822.50 (23.39)	2953.12 (24.15)	2721.75 (24.90)	2457.25 (22.05)	2738.66 (23.62)
Fertilizers	622.87 (5.16)	1071.12 (8.76)	233.88 (2.14)	721.75 (6.48)	662.41 (5.71)
Irrigation (Pumpset)	596.75 (4.94)	541.75 (4.43)	387.81 (3.55)	248.80 (2.23)	443.78 (3.83)
Miscellaneous	245.25 (2.03)	321.50 (2.63)	228.40 (2.09)	198.97 (1.79)	248.53 (2.14)
Depreciation on implements	116.02 (0.96)	101.60 (0.83)	95.58 (0.87)	93.67 (0.84)	101.72 (0.88)
Interest on working capital	624.79 (5.18)	749.56 (6.13)	622.70 (5.70)	669.12 (6.00)	666.54 (5.75)
Cost A	5831.39 (48.32)	6995.86 (57.20)	5811.87 (53.16)	6245.13 (56.03)	6221.08 (53.65)
Rental value of own land	3441.00 (28.51)	3702.37 (30.27)	3718.05 (34.01)	3797.45 (34.07)	3664.72 (31.61)
Interest on fixed capital	56.99 (0.47)	55.21 (0.45)	63.70 (0.58)	60.54 (0.54)	59.11 (0.51)
Cost B	9329.38 (77.30)	10753.44 (87.92)	9593.62 (87.75)	10103.12 (90.64)	9944.91 (85.77)
Imputed family labour wages	2739.64 (22.70)	1476.92 (12.08)	1339.23 (12.25)	1043.20 (9.36)	1649.75 (14.23)
Cost C	12069.02 (100.00)	12230.36 (100.00)	10932.85 (100.00)	11146.32 (100.00)	11594.66 (100.00)

Figures in parenthesis are percentages to total

Table 62. Operationwise maintenance cost per hectare of arecanut - income groups (Figures in Rs)

Particulars	Lowest	Lower	Middle	High	Average
Weeding	721.23 (5.98)	670.12 (5.48)	874.14 (8.00)	800.75 (7.18)	766.56 (6.61)
Plant protection	468.63 (3.88)	645.24 (5.28)	348.25 (3.19)	780.12 (7.00)	560.56 (4.83)
Manures and application	3482.32 (28.85)	3642.12 (29.78)	3301.20 (30.20)	3060.47 (27.46)	3321.53 (28.65)
Fertilizers and application	795.20 (6.59)	1231.12 (10.07)	321.24 (2.94)	926.94 (8.32)	818.63 (7.06)
Irrigation	2117.59 (17.55)	1111.52 (9.09)	1359.59 (12.44)	758.29 (6.80)	1386.75 (11.96)
Miscellaneous	245.25 (2.03)	321.50 (2.63)	228.40 (2.09)	198.97 (1.79)	248.53 (2.14)
Depreciation on implements	116.02 (0.96)	101.60 (0.83)	95.58 (0.87)	93.67 (0.84)	101.72 (0.88)
Interest on working capital	624.79 (5.18)	749.56 (6.13)	622.70 (5.70)	669.12 (6.00)	666.54 (5.75)
Less family wages	2739.64	1476.92	1339.23	1043.20	1649.75
Cost A	5831.39 (48.32)	6995.86 (57.20)	5811.87 (53.16)	6245.13 (56.03)	6221.08 (53.65)
Rental value of own land	3441.00 (28.51)	3702.37 (30.27)	3718.05 (34.01)	3797.45 (34.07)	3664.72 (31.61)
Interest on fixed capital	56.99 (0.47)	55.21 (0.45)	63.70 (0.58)	60.54 (0.54)	59.11 (0.51)
Cost B	9329.38 (77.30)	10753.44 (87.92)	9593.62 (87.75)	10103.12 (90.64)	9944.91 (85.77)
Imputed family labour wages	2739.64 (22.70)	1476.92 (12.08)	1339.23 (12.25)	1043.20 (9.36)	1649,75 (14.23)
Cost C	12069.02 (100.00)	12230.36 (100.00)	10932.85 (100.00)	11146.32 (100.00)	11594.66 (100.00)

Figures in parenthesis are percentages to total

Table 63. Yield, gross returns and income at various costs per hectare from arecanut - holding size groups

Particulars	Smallest	Small	Medium	Large	Average
Yield of dry nuts (kg)	1451.80	1419.40	1509.80	1408.90	1447.48
Gross value (Rs)	18401.62	17964.37	19170.25	17758.12	18323.59
Farm business income (Rs)	12693.29	11840.79	12350.88	11525.14	12102.51
Family labour income (Rs)	8940.37	8180.60	8456.66	7937.17	8378.68
Net farm income(Rs)	5774.87	6814.48	7023.16	7303.30	6728.93
Income at cost C excluding rental value of land (Rs)	9455.19	10407.35	10857.21	10854.92	10393.65
Cost/kg of dry nuts (Rs) at					
Cost A	3.93	4.31	4.52	4.42	4.30
Cost B	6.52	6.89	7.10	6.97	6.87
Cost C	8.70	7.86	8.05	7.42	8.01
Cost C excluding rental value of land (Rs)	6.16	5.32	5.51	4.90	5.48
Benefit cost ratio at cost A	3.224	2.934	2.811	2.849	2.945
Cost B	1.945	1.836	1.789	1.808	1.843
Cost C	1.457	1.611	1.578	1.699	1.580
Cost excluding rental value of land	2.057	2.377	2.306	2.572	2.311

Table 64. Yield, gross returns and income at different costs per hectare from arecanut - income groups

Particulars	Lowest	Lower	Middle	High	Average
Yield of dry nuts (kg)	1341.60	1432.60	1444.20	1571.50	1447.48
Gross value (Rs)	17204.99	18511.87	18590.25	18987.25	18323.59
Farm business income (Rs)	11373.60	11516.01	12778.38	12742.12	12102.51
Family labour income (Rs)	7875.61	7758.43	8996.63	8884.13	8378.68
Net farm income(Rs)	5135.97	6281.51	7657.40	7840.93	6728.93
Income at cost C excluding rental value of land(Rs)	8576.97	9983.88	11375.45	11638.38	10393.65
Cost/kg of dry nuts (Rs) at					
Cost A	4.35	4.88	4.02	3.98	4.30
Cost B	6.95	7.51	6.64	6.43	6.87
Cost C	8.99	8.54	7.57	7.09	8.01
Cost C excluding rental value of land	6.43	5.95	4.99	4.68	5.48
Benefit cost ratio					
at Cost A	2.950	2.646	3.199	3.040	2.945
Cost B	1.844	1.721	1.938	1.879	1.843
Cost C	1.426	1.514	1.700	1.703	1.580
Cost C excluding rental value of land	1.994	2.171	2.577	2.584	2.311

APPENDIX III

PEECHI COMMAND AREA AND THE PROJECT

Information on the general features of the tract facilitates a proper understanding of the problem under study. An attempt is made here to describe the features of the Peechi Command Area and to provide some general information of the irrigation project.

The command area of the Peechi Irrigation Project comprises of parts of Trichur, Mukundapuram, Talappilly and Chavakkad taluks of Trichur district.

Peechi Irrigation Project consists of a dam across Manali river, a tributary of Karuvannur river and canal system consisting of two main canals one on either banks. They, with branches and distributaries irrigate an area of 17,256 hectares in Trichur district. The location of the dam is 76° 15' E longitude and 10° 30' N latitude. The river has its source in the Vaniampara hills of the western ghats. The average rainfall of the area is 2900 mm. The main structure is a straight gravity mansonary dam with a saddle dam of earth.

The dam and reservoir are located at a place called Peechi, 24 KM east of Trichur town. The head work is approached by a good road from National Highway 47 between Trichur and Palghat. The project was started in 1947 and

water was first let out for irrigation in 1953. It has been completed in 1959. The irrigation water from the dam is let out during puncha season in kole lands and during mundakan season in other areas.

Ayacut of the Irrigation Project

The project report of Peechi Command Area envisaged 18,616 hectares consisting of 4856 hectares of drylands into double crop lands, 1619 hectares of single crop to double crop lands, 4047 hectares of double crop lands and 8094 hectares of kole lands. The actual area now irrigated is 17,256 hectares. Thus, there is a shortfall of 1360 hectares consisting of, 930 hectares in the ayacut area in second crop lands and 430 hectares in the ayacut area of kole lands.

Distribution

There are two main canals taking off from the dam. The left bank canal is at a higher elevation (+67.05 m) and feeds an ayacut of 2828 hectares. This fact is evidenced at Kannara, Panancherry sections of the R.B.C. During puncha season when water is released through R.B.C. for kole lands most of the Panancherry area is cultivated and a short duration puncha crop is raised with seepage alone.

The left bank canal is 45 KM in length while the right bank canal is only 37 KM. But the ayacut of R.B.C.

is 6764 ha, while that of L.B.C. is only 2828 ha. This fact reflects the nature of ayacut on each bank. The L.B.C. is taking off at a higher level than R.B.C. The water utilization in the ayacut on left bank is more than that in the right bank. According to the Mangala Bhanu (1977) project report, without making any allowances for transmission loss 131 cm of water is utilized for mundakan crop on left bank ayacut while it is 101 cm for right bank ayacut. The climatological conditions being almost the same the reason for the increased irrigation contribution can only be the heavy percolation if it is not due to bad water management. The right bank canal takes off at (+56.38 M) and feeds an ayacut of 6764 hectares of Mundakan lands. The pipe outlet from dam to R.B.C. has also an offtake into the river close to the dam. There are adequate number of branch canals and distributaries from both main canals. The Irrigation Department has not constructed any field channel for this project.

For distribution of water to kole lands the main supply is through the Manali river. Partial supply is effected through R.B.C. also. Minor Irrigation Department and private individuals pump up water from the river for irrigating paddy and cash crops during puncha season. This area is not officially considered as ayacut of the project.

The canals are opened in August every year to allow water for Mundakan season and closed by the end of December. Out of its total area of 17,256 ha, the ayacut of the Peechi Project covers 13,134.288 ha (76.1%) in Trichur taluk, 1038.158 ha (6%) in Chavakkad taluk, 88.7 ha (0.5%) in Talappilly taluk and 3482.84 ha (20.18%) in Mukundapuram taluk.

Of the total command area of 13,134.288 ha in Trichur taluk, 5396.253 ha of area is in Ollukkara block, which is 41.09 per cent of the total area and 31.27 per cent of the total command area of the project.

Table 1 gives the area irrigated in the Block Panchayatwise under command area.

Table 1. Area irrigated in the Ollukkara Block by Peechi Irrigation Project

Panchayat	Area in hectares
Ollukkara	667.047
Pananoherry	1418.659
Vilvattam	545.051
Kolazhy	614.624
Nadathara	596.229
Puthur	813.115
Madakkathara	741.508
Total	5396.233

Source: Mangala Bhanu (1977) report on Command Area Development (Malampuzha, Peechi, Chalakudy projects)

Table 2. Salient features of the project

A. Hydrological details.

Catchment area	- 107.09 sq.km
Average rainfall in the catchment area	- 2900 mm
Waterspread area	- 12.95 sq.km
Dead storage	- 2.12 mm
Live storage	- 107.07 mm^3
Computed flood discharge	- 368.118 m^3/sec

B. Structural details

Type of main dam	- Straight gravity of rubble masonary
Length of masonary dam	- 213.36 m
Maximum height	- 40.835 m
Length of earth saddle dam	- 121.31 mt
Maximum water level	- + 79.25 mt
Dead storage level	- + 53.34 mt
Spillway crest level	- + 76.20 mt

C. Details of canals

	L.B.C.	R.B.C.
Total length of main canal	- 44.86 km	36.85 km
Capacity at offtake	3.54 cumecs	7.079 cumecs
Total length of branch canals	37.4 km	98.16 km

D. Area benefited

L.B.C. system	- 2,828 hectares
R.B.C. system	- 6,764 hectares
	7,664 hectare of kole lands
Uptodate expenditure (1976)	- Rs.235 lakhs

Source: Mangala Bhanu (1977) report on Command Area Development (Malampuzha, Peechi, Chalakudy projects)

SOCIO-ECONOMIC STUDY OF FARMERS IN OLLUKKARA BLOCK IN THE COMMAND AREA OF PEECHI IRRIGATION PROJECT

By

K. VENKATESWARA RAO

ABSTRACT OF THE THESIS

Submitted in partial fulfilment of the
requirement for the Degree of

Master of Science in Agriculture

Faculty of Agriculture
Kerala Agricultural University

Department of Agricultural Economics

COLLEGE OF HORTICULTURE

Vellanikkara - Trichur

1982

ABSTRACT

This investigation was conducted in Ollukkara Block situated in the command area of Peechi Irrigation Project, with the following objectives, viz., to study methods and practices followed for cultivation, to assess the availability and use of resources, cost and income structure of the farm business savings investment, assets and debts, to study general social-economic conditions - education, consumption pattern, standard of living, etc. and to study the infrastructure facilities available.

One hundred households were selected by adopting two stage random sampling technique and the required information was collected from them by using a pre-tested schedule, through personal interviews.

The study revealed that there was no relationship between income and family size. Literacy rate was found to be higher than the average for the district. Illiteracy did not show any relation with holding size or income level. But all the illiterates were people above 50 years of age. The average holding size on the sample farms was very low.

Paddy is the important crop grown mostly for home consumption. Supplementary irrigation is provided by Peechi project for mundakan paddy only.

The main source of irrigation on sample farms was well. The number of dairy animals per farm showed positive relationship with holding size as well as income.

The fertilizer use on sample farms was far lower than the recommended levels except in the case of nitrogen.

The cost of cultivation showed decline from viruppu paddy to puncha paddy due to changes in the practices followed. The inter holding size group and inter income group differences in cost of cultivation were not clearcut.

The study also showed that puncha paddy was more profitable than the other two crops because of better agro-climatic conditions as well as better water management. The holding size or income level did not show any impact on the cost of cultivation perhaps due to the relatively low importance given to agriculture in the entire farm household economy.

Cost of cultivation of banana and maintenance cost of coconut and arecanut revealed that the cultivation of these crops require heavy investment though they give high net returns. Banana was grown mostly as an intercrop which accounted for lower cultivation cost.

The maintenance costs of coconut and arecanut were low which resulted in poor yields. However, net returns were high.

Even though wide variation was observed among income groups and holding size groups in per capita income, the expenditure on food per adult unit did not show much difference except in the high income group and large holdings group. This might be because of their reluctance to spend more on food. The expenditure on proteinaceous food items like fish, meat and milk was found to be positively associated with the size of holding and gross income of families. The savings in the lower income groups and small holding groups was too low to meet the working capital requirements in crop production in the subsequent season. The influence of income on consumption was found to be more conspicuous.

The infrastructure in the block was well developed and helping the farmer to a great extent in carrying out his farm business. The main problem of the farmers in the region was erratic supply of irrigation water to the farms situated in the lower reaches.