



GOVERNMENT OF KERALA

REPORT ON
COST OF CULTIVATION
OF
IMPORTANT CROPS IN KERALA
1989-90

DEPARTMENT OF ECONOMICS & STATISTICS
THIRUVANANTHAPURAM

1992



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P R E F A C E

This report is based on the tenth round of the Survey on Cost of Cultivation of important crops in Kerala, which was conducted during 1989-'90. The crops covered during this round were Paddy (3 seasons), Coconut, Tapioca and Pepper.

The tabulation of data was done at the district level and the consolidation was done at the headquarters by the staff of the Cost of Cultivation Section of the Department of Economics and Statistics. The report was prepared by Smt. T. Bhavana, Research Officer.

**S. RETNABAI AMMAL,
DIRECTOR.**

*Thiruvananthapuram,
6.1.1992.*

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REPORT ON
THE COST OF CULTIVATION OF IMPORTANT CROPS IN KERALA - 1989-'90

Chapter 1 - General

1.1 Introduction

A realistic assessment of the cost of cultivation and value of product is necessary for formulation and implementation of schemes in agricultural sector, fixation of floor and support prices, etc. Keeping this in view the Government of Kerala accorded sanction for conducting annual surveys on cost of cultivation of important crops in the State. The present report relates to the tenth round of the survey conducted during 1989-'90.

The following crops were covered in the study.

- i. Paddy (3 seasons)
- ii. Coconut
- iii. Tapioca
- iv. Pepper

1.2 Objectives

i. The main objectives of the survey are to estimate the cost of cultivation per hectare of different crops selected,

ii. to compare the costs under different concepts, over a period.

1.3 Staff

The following staff were engaged for the survey.

<u>Category</u>	<u>Number</u>
Field - U.D. Investigator	14
L.D. Investigator	28
Head Research Assistant	1
Office U.D. Compiler	1

1.4 Period of the survey

The period of the survey was the Agricultural year 1989-'90 (July to June)

1.5 Design of the survey

The survey was conducted in 38 taluks, which are important growing centres of the crops under study. From each selected taluk two investigator zones of the EARAS Survey were selected using simple random sampling method. The sample holding consisted of a key plot together with all the other plots (both wet and dry) possessed by the

1.6 Schedules

Three schedules were designed for the survey.

Schedule - I This schedule was used for listing the plots for selection of holdings and recording the details of the selected holdings.

Schedule - II This schedule was used for recording details of the cultivator's households and details like area of holdings, inventory of agricultural implements, livestock, etc.

Schedule - III This schedule was meant for recording cultivation cost, every fortnight.

1.7 Field work

Field work was done by 38 investigators posted at the rate of one investigator in each taluk. The investigators visited the selected holdings every fortnight and recorded fortnightly operations in schedule III. The field work was supervised by Taluk Statistical Officer at the taluk level and by Deputy Director/District Officer at the district level.

1.8 Analysis

The compilation and tabulation were done at the district level by the investigators posted for the survey. Five compilers were posted in the headquarters for the consolidation of the data at the State level. Report was also prepared at the headquarters.

1.9 Method of estimation of cost

(a) Concept of cost:- Different cost concepts, cost 'A', Cost 'B1' and cost 'B' and cost 'C' have been followed in the analysis as shown below.

Cost 'A'

Cost 'A' consists of cash and kind expenses (paid out costs) actually incurred by the cultivators. This includes-

- i. Hired human labour
- ii. Animal labour
- iii. Machine labour
- iv. Seed (Seedlings)
- v. Farmyard manure

- vi. Chemical fertilisers
 - vii. Plant protection
 - viii. Land tax
 - ix. Irrigation cess
 - x. Repair and maintenance charges of implements, machinery and buildings.
 - xi. Interest on working capital
 - xii. Other expenses
- Cost 'B1'

Cost 'A' + Interest on fixed assets (excluding land)

Cost 'B'

Cost 'B1' + Interest on land value.

Cost 'C'

Cost 'B' + Imputed value of family labour.

(b) Procedure for imputation of values of owned inputs

Some of the inputs from homestock are used in the production process. While computing the cost of cultivation it is necessary to impute the value of these inputs. The procedure used for the imputation of values of such homestock inputs is indicated below.

- i. Family labour = Imputed on the basis of average wage rate per work hour of hired labour.
- ii. Owned and exchange human labour - The rate of wages per hour for hired human labour is taken for imputing the value of owned and exchange human labour.
- iii. Owned and exchange animal labour - The rate of charges per hour for hired animal labour is taken for imputing the value of owned and exchange animal labour.
- iv. Owned and exchange machine labour - The hire charges per hour for machine labour has been taken.
- v. Implements - Repair and maintenance charges of implements.

- vi. Owned seed - Farm produced (home grain) seed has been imputed at the prices prevalent in the zone concerned at the time of sowing.
- vii. Farm produced manure - Imputed at the rates prevalent in the zone concerned.
- viii. Interest on owned fixed capital - Interest on the present value of fixed assets such as land, farm, building, implements, machinery, irrigation structure, equipments and livestock (only draught animals) at the rate of 10% per annum has been calculated.
- ix. Interest on working capital - Interest has been charged at the rate of 10% per annum on the working capital, cash and kind expenses excluding items in respect of which payments are generally made after harvest (ie. rent, land tax, etc.) incurred during the period of cultivation.
- x. Payments in kind - The payments in kind have been evaluated at the market prices prevalent in the locality at the time of payment. Perquisites have been included in the payments in kind evaluated at market prices.

(c) Allocation of joint costs to different crops

Some of the inputs used for the cultivation are common for some other crops also. For the purpose of computing the cost share of individual crops, the cost of such inputs is apportioned in the following manner.

- i. Repair and maintenance charges of implements - In proportion to the area under the crop.
- ii. Interest on owned fixed capital (excluding land) - In proportion to the area under the crop.
- iii. Interest on land value - Interest on the value of land under the crops.

(d) Procedure for evaluation of farm assets

- i. Own farm buildings (cattle sheds, storage sheds, etc.) - Evaluated at prices prevailing in the locality.
- ii. Implements and other machinery. - Evaluated at prevalent market prices.

iii. Livestock (only draught animals)

- Evaluated at prevalent market prices

In calculating the cost of production of paddy crop in each season the interest on land value at the rate of 10% per annum for the period of 6 months is taken into account. The land value is estimated at the current market rate in the different areas.

Chaper 2 - Results of the Survey

The crops selected for this round of study were paddy (autumn, winter and summer), coconut, tapioca and pepper.

2.1 Paddy

Paddy is cultivated during the three seasons - autumn, winter and summer. The total area under paddy during 1989-'90 was 5.83 lakh hectares and rice production is estimated at 11.41 lakh tonnes. The area under paddy during the three seasons are given below.

1. Area under paddy during the year 1989-'90 (in lakh hectares)

Season	Area	Percentage to total cropped area
Autumn	2.44	8.20
Winter	2.68	9.08
Summer	0.71	2.40
Total	5.83	19.68

Source: EARAS estimate.

The gross area under paddy was 20% of the total cropped area as seen from the table.

2. Percentage of area under paddy in each season to the total area under paddy during 1989-'90

Season	Percentage
Autumn	41.85
Winter	45.97
Summer	12.18
Total	100.00

About 42% of the gross area under paddy comes under autumn, about 46% under winter and 12% under summer.

The production of rice during the three seasons is given below.

3. Production of rice during 1989-'90
(in lakh tonnes)

Season	Production of rice. (lakh tonnes)	Percentage
Autumn	4.79	41.98
Winter	5.04	44.17
Summer	1.58	13.85
Total	11.41	100.00

(Source: EARAS Estimates)

The average yield rate of paddy per hectare in each season is given in the following table.

4. Average yield of Paddy during 1989-'90

Season	Average yield (Tonne/hect.)
Autumn	2.99
Winter	2.86
Summer	3.39

About 61% of the total irrigated cropped area is under paddy.

i. Autumn (Virippu) Paddy

For the cost study of autumn paddy a total of 370 holdings were selected. Distribution of these sample holdings according to size class (Viz. small, medium and large) of holdings along with the area of holding for each size class and the percentage of area under each size class can be seen in the following table.

5. Area under autumn paddy during 1989-'90

Holding Size class	No. of selected holdings	Area under the crop in the sample (hectare)	Percentage	Area per holding (Hectare)
Small	208	47.84	24.57	0.23
Medium	151	108.72	55.84	0.72
Large	11	38.14	19.59	3.47
Total	370	194.70	100.00	0.53

The average area per sample holding under study is 0.53 hectare.

A. Cost of Cultivation

The cost of cultivation is worked out on the basis of the concepts given in the previous paragraphs. The estimated cost of cultivation of different items per hectare of autumn paddy is given below. (Please refer Appendix - 1 also).

Cost of cultivation per hectare of paddy (Autumn) during the year 1989-'90

Sl. No.	Components of different cost concepts	Cost per hect. (in Rs.)	% distribution of Cost 'A'
1	2	3	4
1.	Hired human labour	3395	54.02
2.	Animal labour	436	6.94
3.	Machine labour	375	5.97
4.	Seed/seedlings	457	7.27
5.	Farmyard manure & Chemical fertilizers	1048	16.68
6.	Plant protection	83	1.32
7.	Land tax and irrigation cess	18	0.29
8.	Repair and maintenance charges	81	1.29
9.	Other expenses	96	1.53
10.	Interest on working capital	295	4.69
11.	Total Cost 'A' (1-10)	6284	100.00
12.	Interest on fixed capital	276	-
13.	Cost 'B1' (11 + 12)	6560	-
14.	Interest on land value	5650	-
15.	Cost 'B' (13 + 14)	12210	-
16.	Imputed value of household labour	299	-
17.	Cost 'C' (15 + 16)	12509	-

Total cost 'A' of cultivation of autumn paddy per hectare works out to Rs.6284/-. From the table it is seen that 54% of the total cost 'A' is towards hired human labour. About 7% goes for animal labour and 6% towards machine labour. The percentage of hired human labour hours to total human labour hours engaged in autumn paddy cultivation is shown below.

7. Percentage of hired human labour hours to total human labour hours

Sex	Holding size class			
	Small	Medium	Large	All sizes
Male	26.34	24.49	14.40	23.37
Female	62.66	66.45	83.32	68.12
Total	89.00	90.94	97.72	91.49

The proportion of hired human labour to total human labour input steadily increases with the increase in the size of holding. Cultivators belonging to large size class are seen to depend for 98% of their requirements on hired labour.

For seed/seedlings 7% of the cost 'A' is accounted and the farmyard manure and chemical fertilizers forms 17%. Only a small percentage i.e. 1% of cost 'A' is spent for plant protection measures. Expenditure on land tax and irrigation cess showed to less than 1%. The percentage share for repair and maintenance of implements and machinery comes to only 1% of the total cost 'A'. The interest on working capital is about 5% and the expenditure towards other items accounts to less than 2%.

Cost 'B1'

Cost 'B1' is estimated by adding the interest on fixed capital (excluding land) to cost 'A'. It works out to Rs.6560/- for 1989-'90 as against Rs.6145/- in 1988-'89.

The interest on land value is found to be Rs.5650/- during the period and it is seen that the interest on land value is minimum in large class and maximum in the case of small size class. The same trend was seen in the previous rounds also.

Cost 'B' and Cost 'C'

Cost 'B' is estimated by adding the interest on land value to Cost 'B1' and Cost 'C' is estimated by adding the imputed value of household human labour to Cost 'B'. Cost 'B' is found to be Rs.12210/- and Cost 'C' is Rs.12509/-. The imputed value of household human labour is Rs.299/- per hectare. A comparative analysis of this labour input with the different size class indicate that the rate of involvement of family labour is higher in the case of small holdings and lower in the case of large holdings. This has important implication that for the large farmer, participation of the household labour is only in the form of supervision and management. The estimates of cost under three major concepts relating to the year under study and to the previous year are given below.

8. Cost of cultivation of (Autumn) paddy in Rs./hect. for 1988-'89 and 1989-'90

Concept of cost	Year	Holding size class			
		Small	Medium	Large	All sizes
Cost 'A'	1988-89	6462	5863	4757	5853
	1989-90	7171	6223	5294	6284
Cost 'B'	1988-89	13766	11403	7046	11826
	1989-90	13392	11537	8218	12210
Cost 'C'	1988-89	14341	11691	7553	12234
	1989-90	13925	11814	8288	12509

Compared to the previous year, the cost of cultivation has increased during 1989-'90, the percentage of increase being 7.36%, 3.25% and 2.25% in the case of Cost 'A', cost 'B' and Cost 'C' respectively.

B. Output

The values of product and by-product per hectare for the period under report are seen to be Rs.6690/- and Rs.1262/- respectively. The total value of product and by-product for each size class is given in the following table.

9. Value of product and by-product per hectare (in Rs.) during 1989-'90

Product/ by-product	Holding size class			
	Small	Medium	Large	All sizes
Paddy	6415	6161	8540	6690
Straw	1671	1305	626	1262
Total	8086	7466	9166	7952

During 1989-'90 the value of by-product has increased to Rs.1262/- per hectare from Rs.1101/- of the previous year in 1988-'89.

The trend of value of product from 1980-'81 onwards is given in the following table. It can be seen that the value of product has almost showed an increasing trend. From 1984-'85 to 1986-'87 a fluctuating trend has been noted as shown in the table.

10. Value of product/hectare (in Rs.)

Year	Value of product
1980-81	2262
1981-82	3446
1982-83	3937
1983-84	5012
1984-85	4368
1985-86	4801
1986-87	4618
1987-88	5189
1988-89	5254
1989-90	6690

C. Cost of production of paddy per quintal

Cost of production of paddy per quintal is estimated by dividing the cost of cultivation per hectare (after deducting the value of

by-product per hectare from the cost of cultivation per hectare) by the quantity of paddy produced per hectare.

11. Cost of production of paddy per quintal during autumn season (in Rs.)

Concept of cost	Holding size class			All sizes
	Small	Medium	Large	
Cost 'A'	251	225	143	209
Cost 'B'	535	468	233	457
Cost 'C'	560	481	235	469

The cost of production of paddy per quintal during the period under report is Rs.209/- when cost 'A' is considered. It is seen that the cost is higher in the case of small size class.

When compared to the previous year the cost of production of autumn paddy per quintal showed a decreasing trend during the current year. It showed a decrease of 9%, 11% and 13% in the case of Cost 'A', Cost 'B' and Cost 'C' respectively.

The percentage decrease for 1989-'90 is shown below.

12. Cost of production per quintal of Autumn paddy during 1988-'89 and 1989-'90 (in Rs.)

Concept of cost	1988-89	1989-90	Percentage decrease
Cost 'A'	229	209	(-)8.73
Cost 'B'	516	457	(-)11.43
Cost 'C'	536	469	(-)12.50

II. Winter (Mundakan) Paddy

During the report period 380 holdings were selected for studying cost of cultivation of winter paddy. The holdings selected have an area of 218.76 hectare. The number and area of the selected holdings for winter paddy crop are furnished in the following table.

Area and number of holdings selected during 1989-'90

Holding size class	No. of holdings	Area under the crop (ha.)	Percentage to total area	Area per holding (hectare)
Small	194	44.16	20.19	0.23
Medium	174	130.18	59.51	0.75
Large	12	44.42	20.30	3.70
All sizes	380	218.76	100.00	0.58

The average area per holding is found to be 0.58 hectares. 20% of the area comes under the small size class, 60% under medium size class and 20% under large size class.

A. Cost of cultivation

The cost of cultivation per hectare of Winter paddy during 1989-'90 is given below (please see Appendix - 2 also).

Cost of cultivation per hectare of Winter paddy 1989-'90

Sl. No.	Components of different cost	Cost per hect. (Rs.)	% distribution of Cost 'A'
1.	Hired human labour	3486	52.03
2.	Animal labour	484	7.22
3.	Machine labour	360	5.37
4.	Seed/seedlings	457	6.82
5.	Farmyard manure & chemical fertilizers	1207	18.01
6.	Plant protection	134	2.00
7.	Land tax and irrigation cess	35	0.52
8.	Repair and maintenance charge of implements, machinery & buildings	106	1.58
9.	Interest on working capital	312	4.66
10.	Other expenses	119	1.78
11.	Total Cost 'A' (1-10)	6700	100.00
12.	Interest on fixed capital (excluding land)	297	-
13.	Cost 'B1' (11+12)	6997	-
14.	Interest on land value	5391	-
15.	Cost 'B' (13+14)	12388	-
16.	Imputed value of household labour	352	-
17.	Cost 'C' (15+16)	12740	-

The expenditure on hired human labour per hectare of Winter paddy crop is seen to be Rs.3486/-. About half cost 'A' is accounted by hired human labour. The percentage of hired human labour hours engaged in the Paddy (Winter) cultivation to the total labour hours is given in the following table.

Percentage distribution of hired human labour hours to total labour hours

Sex	Holding size class			All
	Small	Medium	Large	
Male	29.98	27.14	18.65	26.54
Female	57.67	64.32	78.57	64.85
Total	87.65	91.46	97.22	91.39

It is seen that the hired human labour hours accounted for about 91% of the total human labour hours in Winter paddy cultivation. Hired labour is more in the case of females.

The cost of animal labour utilised in winter paddy cultivation is found to be Rs.484/- per hectare for the period under report. The cost of animal labour accounts to 7% and 5% of the Cost 'A' is shared by machine labour. The cost of machine labour for winter paddy is more in large size class than in small and medium size classes. About 7% of the total Cost 'A' is spent for seed/seedlings and 18% is towards farmyard manure and chemical fertilisers. The cost of plant protection measures is estimated to Rs.134/- in 1989-'90. Nearly 1% is for land tax and irrigation cess. Percentage share towards repair and maintenance charges of implements, machinery and building is about 2% and interest on working capital is estimated to be Rs.312/- which is about 5% of the total Cost 'A'. Nearly 2% of the total Cost 'A' comes under other expenses.

The interest on fixed capital excluding land is estimated at Rs.297/- per hectare and Cost 'B1' is found to be Rs.6997/-. Interest on land value works out to Rs.5391/- and Cost 'B' comes to Rs.12388/- per hectare. The imputed value of family labour is Rs.352/-. It is maximum in the case of small cultivators and minimum in the case of large cultivators.

The estimated cost for the cultivation of winter paddy per hectare under the three major concepts of cost are given below.

**Cost of cultivation under three major concepts of cost
(Rs./hectare)**

Concept of Cost	Holding size class			
	Small	Medium	Large	All sizes
Cost 'A'	7846	6717	5474	6700
Cost 'B'	15032	12534	9203	12388
Cost 'C'	15682	12880	9277	12740

When compared with the corresponding costs for the previous round, Cost 'A' showed a nominal decrease during the current year. The percentage decrease being 1.97%

**Cost of cultivation of Winter paddy (Rs./hect.)
for 1988-'89 and 1989-'90**

Concept of Cost	Year	Holding size class			
		Small	Medium	Large	All sizes
Cost 'A'	1988-89	7556	6568	6623	6835
	1989-90	7846	6717	5474	6700

(Contd.)

(Table contd.)

1	2	3	4	5	6
Cost 'B'	1988-89	16231	12562	12409	13403
	1989-90	15032	12534	9203	12388
Cost 'C'	1988-89	16706	12952	12497	13747
	1989-90	15682	12880	9277	12740

B. Output

The estimates of value of paddy and straw obtained from winter paddy cultivation is given below.

Value of output

Product and by-product	Holding size class			
	Small	Medium	Large	All sizes
Paddy	6743	6993	8096	7166
Straw	2606	1995	998	1916
Total	9349	8988	9094	9082

C. Cost of production of paddy per quintal

Cost of producing one quintal of paddy is worked out by dividing the cost of cultivation per hectare (after deducting the value of by-product per hectare from the cost of cultivation per hectare) by the yield per hectare.

Cost of production of Winter paddy per quintal (Rs.)

Concept of Cost	Holding size class			
	Small	Medium	Large	All sizes
Cost 'A'	223	192	145	186
Cost 'B'	528	429	265	408
Cost 'C'	555	443	268	422

The cost of production of winter paddy is higher in the case of small size holdings and lower in the case of large size holdings.

The cost of production of winter paddy per quintal for 1988-89 and 1989-890 are presented below for the purpose of comparison.

**Cost of production of winter paddy per quintal (in Rs.)
for 1988-'89 and 1989-'90**

Concept of Cost	Holding size class							
	Small		Medium		Large		All size classes	
	1988-89	89-90	88-89	89-90	88-89	89-90	88-89	89-90
Cost 'A'	187	223	174	192	145	145	171	186
Cost 'B'	534	528	405	429	302	265	405	408
Cost 'C'	553	555	420	443	304	268	417	422

When compared to the previous year cost of production of winter paddy per quintal showed an increasing trend during the current year. It is found that Cost 'A' is higher in the case of small and medium size holdings for 1989-'90 than 1988-'89 while in the case of large size holdings it is more or less the same.

The percentage increase being 8.77%, 0.74% and 2.64% and 1.19% in the case of Cost 'A' Cost 'B' and Cost 'C' respectively.

iii. Summer (Punja) Paddy

In the case of summer paddy, the number of holdings in the sample were 349 during 1989-'90. These holdings cover total area of 148.23 hectare. The average area per holding is given in the following table.

Area under summer paddy

Holding Size class	No. of selected holdings	Area under paddy in hectare	Percentage to total area under paddy	Area per holding (hectares)
Small	232	45.09	30.42	0.19
Medium	112	87.60	59.10	0.78
Large	5	15.54	10.48	3.10
Total	349	148.23	100.00	0.42

The average area per sample holding is found to be 0.42 hectare.

From the 349 holdings studied, the total Cost 'A' per hectare that is, cash and kind expenses is found to be Rs.7619/-. The cost of cultivation per hectare is given in the following table (please see Appendix 3 also).

Cost of cultivation per hectare of Summer paddy 1989-'90

Sl. No.	Component of different cost	Cost per hect. (Rs.)	% distribution of Cost 'A'
1.	Hired human labour	3979	52.22
2.	Animal labour	467	6.13
3.	Machine labour	391	5.14
4.	Seed/seedlings	462	6.06
5.	Farmyard manure & chemical fertilizers	1262	16.57
6.	Plant protection	266	3.49
7.	Land tax and irrigation cess	34	0.44
8.	Repair and maintenance charge of implements, machinery and buildings	152	2.00
9.	Interest on working capital	363	4.76
10.	Other expenses	243	3.19
11.	Total Cost 'A' (1 - 10)	7619	100.00
12.	Interest on fixed capital (excluding land)	371	-
13.	Cost 'B1' (11 + 12)	7990	-
14.	Interest on land value	3988	-
15.	Cost 'B' (13 + 14)	11978	-
16.	Imputed value of household labour	504	-
17.	Cost 'C' (15 + 16)	12482	-

The human, animal and machine labour cost per hectare is 4837/- which constitutes about 63% of the total Cost 'A'. Out of this hired human labour cost constituted 52%, animal labour cost nearly 6% and machine labour 5%. The percentage of hired human labour hours engaged in the cultivation of summer paddy during 1989-'90 is given below.

Percentage of hired human labour hours engaged in Summer Paddy cultivation

Holding size class	Male	Female	Total
Small	29.41	52.05	81.46
Medium	26.22	67.41	93.63
Large	15.97	81.91	97.88
All sizes	26.22	63.84	90.06

About 90% of the total human labour hours is hired human labour. About 6% of the total Cost 'A' is for seed/seedlings and 16% of total Cost 'A' constitutes the cost of farmyard manure and chemical fertilisers 3% (Rs.266) was spent towards plant protection. The expenditure per hectare of land tax and irrigation cess is found to be Rs.14/- and Rs.20/- respectively. The interest on working capital is estimated to be Rs.363/- (5%) per hectare.

Cost 'B1' and Cost 'B'

Cost 'B1' is obtained by adding the interest on fixed capital (excluding land) to Cost 'A' and is seen to be Rs.7990/-. The interest on land value during this period also is maximum in the case of small holding size class and minimum in the case of large holding size class. Cost 'B' is seen to be Rs.11978/- per hectare during 1989-'90. The imputed value of household labour is maximum (Rs.1013/-) in the case of small class and minimum (Rs.120/-) in the case of large size class i.e., small size class engaged themselves in the cultivation practices than the cultivators belonging to large size class. The animal labour has decreased as size class increases. While machine labour is maximum in the case of medium size class. This goes to show that medium size class are interested in using machines for cultivation.

Cost 'B1' is found to be higher in the case of small size holdings. The interest on land value per hectare is found to be Rs.5833/- and Rs.2018/- respectively in the case of small holding size class and large holding size classes. Cost 'B' is higher in the case of cultivators belonging to small holding size class and it is lower in the case of large size classes. When the cost of cultivation is compared with the previous year, the Cost 'A' has decreased by 5.31%.

Cost of cultivation of summer paddy Rs./hect. for 1988-'89 and 1989-'90

Concept of cost	Year	Holding size class			
		Small	Medium	Large	All sizes
Cost 'A'	1988-89	7464	8124	8497	8047
	1989-90	7896	7511	7002	7619
Cost 'B'	1988-89	14645	13229	12295	13386
	1989-90	14052	11354	9072	11978
Cost 'C'	1988-89	15520	13628	12298	13804
	1989-90	15065	11675	9192	12482

B. Output

The value of output is seen to be Rs.10670/- per hectare for the summer paddy. The details for the different holding size classes are given as follows.

Value of product and by-product per hectare for 1989-'90

Product/ by-product	Holding size class			
	Small	Medium	Large	All sizes
Paddy	7941	9366	10892	9092
Straw	2146	1476	503	1578
Total	10087	10842	11395	10670

C. Cost of production of paddy per quintal

Cost of producing one quintal of paddy is got by dividing the cost of cultivation per hectare (after deducting the value of by-product per hectare from the cost of cultivation per hectare) by the yield per hectare.

Cost of production of summer paddy per quintal

Concept of cost	Holding size class			
	Small	Medium	Large	All sizes
Cost 'A'	204	174	159	181
Cost 'B'	422	284	209	311
Cost 'C'	458	293	212	326

A comparison between the cost of production of paddy per quintal during 1988-'89 and 1989-'90 is given in the following table.

Cost of production of paddy/quintal during 1988-'89 and 1989-'90

Concept of Cost	1988-'89	1989-'90
Cost 'A'	183	181
Cost 'B'	335	311
Cost 'C'	347	326

2.2 Coconut

Coconut as an oil seed of the State occupies an important place in the economy. During the agricultural year 1989-90 about 8.76 lakh hectares is under coconut cultivation i.e. about 30% of the total cropped area in the State is under coconut. The area and the average yield per hectare is given in the following table.

Area and average yield of coconut 1989-'90

Area under coconut (Ha)	Percentage to total cropped area	Average yield per hectare (No. of nuts)
875892	29.56	4812

(Source: TRS Provisional estimates 1989-'90)

Selected holdings

The details of the selected holdings of the crop coconut are given below.

Number of holdings and area under coconut

<i>Holding size class</i>	<i>No. of holdings</i>	<i>Area under coconut in the sample (ha.)</i>	<i>Percentage</i>	<i>Area per holding (ha.)</i>
<i>Small</i>	89	13.07	7.32	0.15
<i>Medium</i>	239	95.16	53.27	0.40
<i>Large</i>	53	70.41	39.41	1.32
<i>All sizes</i>	381	178.64	100.00	0.46

381 holdings were selected for the study of the cost of cultivation of coconut during the period under report. The average area per sample holding is 0.46 hectare.

Number of bearing trees in the selected holdings

The average number of bearing and non-bearing trees per hectare in the selected plots were 144 and 74 respectively during the period under report. 66% of the total coconut trees in the selected plots was found to be bearing and the remaining non-bearing.

Number of bearing and non-bearing trees per hectare

<i>Type of trees</i>	<i>No. of trees per hect.</i>	<i>Percentage</i>
<i>Bearing</i>	144	66.06
<i>Non-bearing</i>	74	33.94
<i>Total</i>	218	100.00

A. Cost of cultivation

The cost of cultivation of coconut estimated under the different concepts of cost is given below.

i. Cost 'A'

It is estimated that Rs.2173/- is spent towards the labour cost during 1989-'90. It is 47% of the total Cost 'A'. The estimated cost of cultivation of different items per hectare of coconut is given in the following table. (Please refer Appendix - 4 also).

*Cost of cultivation per hectare of coconut
during the year 1989-'90*

Sl. No.	Components of different cost concept	Cost per hectare (in Rs.)	% distribution of Cost 'A'
1.	Hired human labour	2050	44.27
2.	Animal labour	15	0.32
3.	Machine labour	108	2.33
4.	Seed/seedlings	24	0.52
5.	Farmyard manure & chemical fertilizers	1745	37.68
6.	Plant protection	10	0.22
7.	Land tax and irrigation cess	13	0.28
8.	Repair and maintenance charges	71	1.53
9.	Other expenses	182	3.93
10.	Interest on working capital	413	8.92
11.	Total Cost 'A' (1 - 10)	4631	100.00
12.	Interest on fixed capital	615	-
13.	Cost 'B1' (11 + 12)	5246	-
14.	Interest on land value	38198	-
15.	Cost 'B' (13 + 14)	43444	-
16.	Imputed value of household labour	308	-
17.	Cost 'C' (15 + 16)	43752	-

The percentage of hired human labour hours to total human labour hours is given below.

*Percentage distribution of hired human labour hours to
the total human labour hours*

Sex	Holding size class			
	Small	Medium	Large	All sizes
Male	54.49	71.87	77.13	71.83
Female	11.01	9.96	11.86	10.69
Total	65.50	81.83	88.99	82.52

About 83% of the total human labour hours has been constituted by hired human labour. Rs.24/- per hectare is spent towards seed/seedlings for new plantation. The cost for farmyard manure and chemical fertilizers per hectare is Rs.1745/-, showing that about 38% of the total Cost 'A' is spent on these items. An amount of Rs.10/- is spent for plant protection per hectare. The expenditure towards land tax and irrigation cess is found to be Rs.13/- per hectare. The charges towards repair, maintenance of implements, machinery, buildings, etc. is Rs.71/- per hectare. Interest on working capital is estimated to be Rs.413/- per hectare. The other expenses were found to be Rs.182/- per hectare. The

interest on fixed capital is estimated to be Rs.615/- per hectare (excluding land improvement).

ii. Cost 'B1' and Cost 'B'

Cost 'B1' is estimated by adding the interest on fixed capital (excluding land) to Cost 'A'. It is found to be Rs.5246/- per hectare.

Cost 'B' is estimated to be Rs.43444/-. Imputed value of household labour is Rs.308/- per hectare. Interest on land value is higher in the case of cultivators belonging to small holding size class and it is lower in the case of large size classes.

iii. Cost 'C'

During this round also, the family labour is seen to be higher in small holding size class and lower in large holding size class. Cost 'C' is estimated as Rs.43752/- per hectare.

Cost of cultivation of coconut per hectare during 1988-'89 and 1989-'90

Concept of Cost	Cost per hectare (in Rs.)		Percentage of increase
	1988-89	1989-90	
Cost 'A'	3973	4631	16.56
Cost 'B'	40727	43444	6.67
Cost 'C'	41064	43752	6.55

When the cost of cultivation is compared with the previous year, the Cost 'A' has increased by 16.56% and Cost 'B' 6.67% and Cost 'C' by 6.55%.

B. Value of product

The total value of output per hectare is seen to be Rs.11323/- during 1989-'90

Value of output per hectare

Output	Value (in Rs.)
Product	10789
By-Product	534
Total	11323

2.3 Tapioca

As a traditional subsistence crop, tapioca is cultivated throughout the State. During the current year the area under tapioca is seen increasing. The area has increased from 1.69 lakh hectares to 2.01 lakh hectares during 1989-'90.

Area and average yield of tapioca during 1989-'90

Area under tapioca (lakh hect.)	Average yield per hectare (tonnes)	% of area under tapioca to total cropped area
2.01	18.31	6.78

During the period under report the average yield of tapioca per hectare was 18.31 tonnes and the percentage of the total cropped area was 6.78.

A total of 177 holdings were selected for studying the cost of cultivation of tapioca in Kerala. The number of holdings and area are given below.

Area and number of holdings selected during 1989-'90

Size class	Number of holdings selected	Area under tapioca in the sample (hectare)	Percentage to total area	Area per holdings (hectare)
Small.	106	12.76	31.84	0.12
Medium	66	22.11	55.16	0.34
Large	5	5.21	13.00	1.04
All sizes	177	40.08	100.00	0.23

The average area per sample holding is 0.23 hectare. The total area of the holdings selected for studying the cost of cultivation of tapioca was 40.08 hectare.

A. Cost of cultivation

The Cost 'A' is estimated to be Rs.6367/- per hectare. The human, animal and machine labour cost is seen to be Rs.3658/- which is 57.45% of the total Cost 'A'

**Cost of cultivation per hectare of Tapioca
for the year 1989-'90**

Sl. No.	Components of different cost concept	Cost per hectare (in Rs.)	% distribution of Cost 'A'
1	2	3	4
1.	Hired human labour	3575	56.15
2.	Animal labour	28	0.44
3.	Machine labour	55	0.86
4.	Seed/seedlings	254	3.99
5.	Farmyard manure & chemical fertilizers	1638	25.73
6.	Plant protection	30	0.47
7.	Land tax and irrigation cess	9	0.14
8.	Repair and maintenance charges	84	1.32
9.	Other expenses	124	1.95
10.	Interest on working capital	570	8.95
11.	Total Cost 'A' (1 - 10)	6367	100.00
12.	Interest on fixed capital	552	-
13.	Cost 'B1' (11 + 12)	6919	-
14.	Interest on land value	31000	-
15.	Cost 'B' (13 + 14)	37919	-
16.	Imputed value of household labour	760	-
17.	Cost 'C' (15 + 16)	38679	-

Note:- Figures in column (4) give the percentage to total Cost 'A'.

The percentage of hired human labour hours engaged in tapioca cultivation is given below.

Percentage distribution of hired human labour hours

Sex	Holding size class			All sizes
	Small	Medium	Large	
Male	58.88	67.33	69.80	64.96
Female	15.48	14.52	17.47	15.21
Total	74.36	81.85	87.27	80.17

About 80% of the total human labour hours account for hired human labour. About 4% of the total Cost 'A' is spent towards seed/seedlings and Rs.1638/- is for farm yard manure and chemical fertilizers. Rs.9/- is spent for land tax and irrigation cess. The repair and maintenance charges on implements and machinery per hectare is Rs.84/-. The interest on working capital is Rs.570/- and other expense is Rs.124/- respectively.

The interest on fixed capital (excluding land value) is Rs.552/- per hectare. Cost 'B1' is estimated to be Rs.6919/-. The interest on

land value is estimated to be Rs.31000/- per hectare and Cost 'B' is estimated to be Rs.37919/- per hectare. The imputed value of household labour is Rs.760/- per hectare. Cost 'C' is estimated to be Rs.38679/- per hectare. The estimated cost of tapioca cultivation under different cost concepts are shown below.

Estimated cost of tapioca cultivation

Concept of Cost	Cost per hectare (Rs.)
Cost 'A'	6367
Cost 'B'	37919
Cost 'C'	38679

A comparison between the cost of production of tapioca during 1988-'89 and 1989-'90 is given in the following table.

*Cost of Tapioca cultivation per hectare during
1988-'89 and 1989-'90*

Concept of Cost	Cost per hect. (Rs.)		% increase in cost of cultivation
	1988-89	1989-90	
Cost 'A'	5709	6367	11.53
Cost 'B'	36769	37919	3.12
Cost 'C'	37636	38679	2.77

B. Output

The value of output per hectare is found to be Rs.11884/-.

2.4 Pepper

As a foreign exchange earner pepper occupy an important place in Kerala economy. The total area under pepper and the average yield per hectare during 1989-'90 are given in the following table.

Area and average yield of pepper

Area under pepper (in hectare)	Average yield of pepper in Kg.per hect.	Percentage of area under pepper to the total cropped area
151423	286	5.11

(Source: TRS Estimates)

5% of the gross area under crops in the State is under pepper cultivation.

Selected holdings

180 holdings were selected for studying the cost of cultivation of pepper during 1989-'90. The area and the number of holdings selected for pepper are given in the following table.

Area under pepper in the sample

Holding size class	No. of selected holdings	Total area under the crop (hect)	Percentage to total area of selected holdings	Area per holding
Small	161	9.55	59.02	0.06
Medium	17	4.72	29.17	0.28
Large	2	1.91	11.81	0.96
All sizes	180	16.18	100.00	0.09

The operational area under the crop in the selected holdings is 16 hectare during the period.

A. Cost of Cultivation of Pepper

The different concepts of cost estimated for the crop pepper are discussed in the following paragraphs. The components of Cost 'A' per hectare of pepper cultivation for the year 1989-'90 are given in the following table.

Cost of cultivation per hectare of pepper during the year 1989-'90

Sl. No.	Component of different cost	Cost per hect. (Rs.)	% distribution of Cost 'A'
1.	Hired human labour	3003	49.91
2.	Animal labour	9	0.15
3.	Machine labour	75	1.25
4.	Seed/seedlings	759	12.61
5.	Farmyard manure & chemical fertilizers	1368	22.73
6.	Plant protection	51	0.85
7.	Land tax and irrigation cess	10	0.17
8.	Repair and maintenance charge of implements, machinery & buildings.	95	1.58
9.	Interest on working capital	547	9.09
10.	Other expenses	100	1.66

(Contd.)

(Table contd.)

1	2	3	4
11. Total Cost 'A' (1 - 10)		6017	100.00
12. Interest on fixed capital (excluding land)		693	-
13. Cost 'B1' (11 + 12)		6710	-
14. Interest on land value		36848	-
15. Cost 'B' (13 + 14)		43558	-
16. Imputed value of household labour		1122	-
17. Cost 'C' (15 + 16)		44680	-

The expenditure towards the hired human labour cost is estimated as Rs.3003/- during the year 1989-'90.

About 50% of the Cost 'A' accounts for this item. The percentage of hired human labour hours engaged in pepper cultivation to the total labour hours is shown hereunder.

**Percentage distribution of hired human labour hours
to total human labour hours**

Sex	Holding size class			
	Small	Medium	Large	All sizes
Male	50.66	69.52	70.14	63.44
Female	10.27	9.12	11.13	10.17
Total	60.93	78.64	81.27	73.61

It is seen that 74% of the total human labour hours accounted for hired human labour and the remaining towards household and exchange human labour hours. Female hired human labour is low in the case of pepper cultivation.

The cost towards seed/seedlings is Rs.759/- per hectare i.e. about 13% of the total Cost 'A'. This amount is spent for new planting in pepper growing plots. Rs.1368/- is spent for the cost of farmyard manure and chemical fertilizers which is 23% of the total Cost 'A'. The expenditure towards land tax and irrigation cess is Rs.10/- which is only a negligible percent of the total Cost 'A'. The cost towards repair and maintenance charges of implements and machinery contributes about 2% of the total Cost 'A' (Rs.95/- per hectare). Rs.547/- is seen as the interest on working capital. 9% of the total Cost 'A' constitutes towards this item. About 2% of the total Cost 'A' i.e. Rs.100/- is spent towards 'other expenses'.

Cost 'B1'

Cost 'B1' is estimated by adding the interest on fixed capital (excluding land) to Cost 'A'. It works out to Rs.6710/- for 1989-'90.

The interest on land value is found to be Rs.36848/- during the period under report.

Cost 'B' and Cost 'C'

Cost 'B' is estimated by adding the interest on land value to Cost 'B1' and Cost 'C' is estimated by adding the imputed value of household labour to Cost 'B'. Cost 'B' is found to be Rs.43558/- and Cost 'C' is Rs.44680/-. The imputed value of household labour is Rs.1125/- per hectare.

B. Value of Output

The value of pepper is found to be Rs.12812/- per hectare during the period under study.

CHAPTER 3 - SUMMARY OF FINDINGS

The Cost of cultivation of important crops viz., Paddy (Autumn, Winter and Summer), Coconut, Tapioca and Pepper are worked out by analysing the data collected through the survey 1989-'90.

1. Autumn Paddy

The cost of cultivation of autumn paddy per hectare ie. Cost 'A' is estimated to be Rs.6284/- during 1989-'90. Labour cost constitutes 67% of the total Cost 'A'. The percentage of cost towards farm yard manure and chemical fertilisers forms 17%. During this round Cost 'B' is found to be Rs.12210/- and Cost 'C' is Rs.12509/-.

2. Winter Paddy

The cost of cultivation of Winter paddy per hectare ie. Cost 'A' is worked out to be Rs.6700/- for the year 1989-'90.

Taking into consideration, the imputed value of household labour and interest on fixed capital, the cost of cultivation of winter paddy per hectare (Cost 'C' is estimated to be Rs.12740/-. Labour cost constitutes 65% of the total Cost 'A'. The percentage share of farmyard manure and chemical fertilizers accounts 18%.

3. Summer Paddy

The cost of cultivation of summer paddy per hectare (Cost 'A' is estimated to be Rs.7619/- during 1989-'90. Labour cost constitutes 63% of the total Cost 'A'. 16% of the total Cost 'A' constitutes the cost of farmyard manure and chemical fertilizers. During this round Cost 'B' is seen to be Rs.11978/- and Cost 'C' is Rs.12482/-.

4. Coconut

During this round the Cost 'A', 'B' and 'C' per hectare of coconut cultivation is estimated to be 4631/-, Rs.43444/- and Rs.43752/- respectively. Labour cost constitutes to 47% of the total Cost 'A'.

5. Pepper

The cost of cultivation of pepper per hectare (Cost 'A') is estimated to be Rs.6017/- during the period under review. The labour cost constitutes 51% of the total Cost 'A'.

6. Tapioca

The cost of cultivation of tapioca per hectare (Cost 'A') is estimated to be Rs.3658/- during 1989-'90. Labour cost constitutes to 57% of the total Cost 'A'.

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Appendix 1 - Cost of cultivation per hectare (in Rs.) of paddy (Autumn)
during the year 1989-'90

Sl. No.	Components of different cost concept	Holdings size class			
		Small	Medium	Large	All sizes
1	2	3	4	5	6
1.	Hired human labour	4000	3420	2563	3395
2.	Animal labour	672	432	153	436
3.	Machine labour	277	377	492	375
4.	Seed/seedlings	480	447	454	457
5.	Farmyard manure & chemical fertilizers	1172	1040	918	1048
6.	Plant protection	63	72	141	83
7.	Land tax and irrigation cess	17	15	27	18
8.	Repair and maintenance charges	114	62	55	81
9.	Other expenses	41	65	255	96
10.	Interest on working capital	335	293	236	295
11.	Total Cost 'A' (1 - 10)	7171	6223	5294	6284
12.	Interest on fixed capital	296	278	171	276
13.	Cost 'B1' (11 + 12)	7467	6501	5465	6560
14.	Interest on land value	5925	5036	2753	5650
15.	Cost 'B' (13 + 14)	13392	11537	8218	12210
16.	Imputed value of household labour	533	277	70	299
17.	Cost 'C' (15 + 16)	13925	11814	8288	12509

*Appendix 2 - Cost of cultivation per hectare (in Rs.) of
paddy (winter) during the year 1989-'90*

Sl. No.	Components of different cost concept	Holding size class			All sizes
		Small	Medium	Large	
1	2	3	4	5	6
1.	Hired human labour	4100	3548	2692	3486
2.	Animal labour	819	478	170	484
3.	Machine labour	266	377	405	360
4.	Seed/seedlings	513	422	508	457
5.	Farmyard manure & chemical fertilizers	1429	1194	1026	1207
6.	Plant protection	108	113	220	134
7.	Land tax and irrigation cess	14	36	52	35
8.	Repair and maintenance charges	126	112	22	106
9.	Other expenses	104	124	122	119
10.	Interest on working capital	367	313	257	312
11.	Total Cost 'A' (1 - 10)	7846	6717	5474	6700
12.	Interest on fixed capital	354	292	159	297
13.	Cost 'B1' (11 + 12)	8200	7009	5633	6997
14.	Interest on land value	6832	5525	3570	5391
15.	Cost 'B' (13 + 14)	15032	12534	9203	12388
16.	Imputed value of household labour	650	346	74	352
17.	Cost 'C' (15 + 16)	15682	12880	9277	12740

Appendix 3 - Cost of cultivation per hectare (in Rs.) of
paddy (Summer) during the year 1989-'90

Sl. No.	Components of different cost concept	Holding size class			
		Small	Medium	Large	All sizes
1	2	3	4	5	6
1.	Hired human labour	3899	3949	4380	3979
2.	Animal labour	669	383	37	467
3.	Machine labour	328	437	319	391
4.	Seed/seedlings	459	454	514	462
5.	Farmyard manure & chemical fertilizers	1550	1160	1009	1262
6.	Plant protection	193	301	281	266
7.	Land tax and irrigation cess	34	28	78	34
8.	Repair and maintenance charges	137	183	5	152
9.	Other expenses	251	258	46	243
10.	Interest on working capital	376	358	333	363
11.	Total Cost 'A' (1 - 10)	7896	7511	7002	7619
12.	Interest on fixed capital	323	456	52	371
13.	Cost 'B1' (11 + 12)	8219	7967	7054	7990
14.	Interest on land value	5833	3387	2018	3988
15.	Cost 'B' (13 + 14)	14052	11354	9072	11978
16.	Imputed value of household labour	1013	321	120	504
17.	Cost 'C' (15 + 16)	15065	11675	9192	12482

Appendix 4 - Cost of cultivation per hectare of
coconut during the year 1989-'90

Sl. No.	Components of different cost concept	Holding size class			
		Small	Medium	Large	All sizes
1	2	3	4	5	6
1.	Hired human labour	2092	2167	1882	2050
2.	Animal labour	9	11	22	15
3.	Machine labour	123	112	100	108
4.	Seed/seedlings	21	18	34	24
5.	Farmyard manure & chemical fertilizers	1748	1715	1728	1745
6.	Plant protection	8	7	13	10
7.	Land tax and irrigation cess	24	14	10	13
8.	Repair and maintenance charges	73	65	81	71
9.	Interest on working capital	419	422	396	413
10.	Other expenses	188	185	176	182
11.	Total Cost 'A' (1 - 10)	4705	4716	4442	4631
12.	Interest on fixed capital	694	597	608	615
13.	Cost 'B1' (11 + 12)	5399	5313	5050	5246
14.	Interest on land value	39247	38906	37048	38198
15.	Cost 'B' (13 + 14)	44646	44219	42098	43444
16.	Imputed value of household labour	880	345	152	308
17.	Cost 'C' (15 + 16)	45526	44564	42250	43752

Appendix 5 - Cost of cultivation per hectare of
Tapioca during the year 1989-'90

Sl. No.	Components of different cost concept	Holding size class			
		Small	Medium	Large	All sizes
1	2	3	4	5	6
1.	Hired human labour	3303	3529	4438	3575
2.	Animal labour	30	25	38	28
3.	Machine labour	23	86	-	55
4.	Seed/seedlings	249	257	253	254
5.	Farmyard manure & chemical fertilizers	1737	1590	1601	1638
6.	Plant protection	2	42	45	30
7.	Land tax and irrigation cess	7	11	5	9
8.	Repair and maintenance charges	113	51	46	84
9.	Other expenses	95	90	342	124
10.	Interest on working capital	544	562	672	570
11.	Total Cost 'A' (1 - 10)	6103	6243	7440	6367
12.	Interest on fixed capital	616	493	319	552
13.	Cost 'B1' (11 + 12)	6719	6736	7759	6919
14.	Interest on land value	29934	31245	32572	31000
15.	Cost 'B' (13 + 14)	36653	37981	40331	37919
16.	Imputed value of household labour	995	684	510	760
17.	Cost 'C' (15 + 16)	37648	38665	40841	38679

Appendix 6 - Cost of cultivation per hectare of
Pepper during the year 1989-'90

Sl. No.	Components of different cost concept	Holding size class			
		Small	Medium	Large	All sizes
1	2	3	4	5	6
1.	Hired human labour	2020	4215	4918	3003
2.	Animal labour	3	25	-	9
3.	Machine labour	48	31	314	75
4.	Seed/seedlings	25	130	604	759
5.	Farmyard manure & chemical fertilizers	992	1653	2550	1368
6.	Plant protection	20	82	130	51
7.	Land tax and irrigation cess	9	10	14	10
8.	Repair and maintenance charges	88	138	107	95
9.	Other expenses	56	190	98	100
10.	Interest on working capital	326	647	874	547
11.	Total Cost 'A' (1 - 10)	3587	7121	9609	6017
12.	Interest on fixed capital	635	906	1687	693
13.	Cost 'B1' (11 + 12)	4222	8027	11296	6710
14.	Interest on land value	40149	37505	18723	36848
15.	Cost 'B' (13 + 14)	44371	45532	30019	43558
16.	Imputed value of household labour	1218	896	487	1122
17.	Cost 'C' (15 + 16)	45589	46428	30506	44680

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