

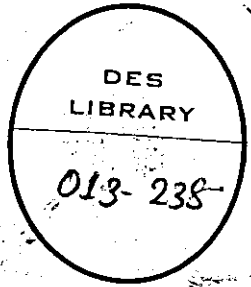
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**CROP ESTIMATION SURVEYS**  
**KERALA STATE**

**CONSOLIDATED RESULTS OF**  
**CROP ESTIMATION SURVEYS ON**  
**PADDY AND TAPIOCA 1965-66**

ISSUED BY  
THE ADDITIONAL DIRECTOR  
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### FOREWORD

This report is the second in the series of "Cons<sup>op</sup> Estimation Surveys". The report is prepared on the basis of the recommendations made in the conference of the State Statisticians in-charge of crop estimation surveys to fall in line with the reports published at the All India level. The report consists of an introductory part and 10 tables giving a detailed picture of the crop estimation surveys on principal food crops conducted by the Bureau of Economics & Statistics during the year 1965-66.

Bureau of Economics & Statistics,  
Trivandrum, 21-3-1967.

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## CONSOLIDATED RESULTS OF CROP ESTIMATION SURVEYS ON PADDY AND TAPIOCA 1965-66

### 1. *Introduction:*

This review attempts to bring together the consolidated results of crop estimation surveys carried out during 1965-66 for estimating the production of rice (dry grain) and tapioca (raw) in Kerala State. This review is the second of its kind and it includes information on yield estimates of rice and tapioca and the drriage ratios for rice at the District level.

### 2. *Objective, Coverage and Design:*

The primary object of these surveys is to obtain through crop cutting experiments fairly precise estimates of average yield per hectare of the crops mentioned above for each taluk and these results are used to estimate the average yield for the State.

A crop cutting experiment usually consists of locating and marking of a plot of specified size by the principle of random sampling in randomly chosen fields, and harvesting, threshing and recording the weight of produce within it. In a sub-sample of experiments, further processing of the harvested produce is also done for determining the percentage recovery of dry grain.

The survey is conducted in respect of two important seasonal crops in the State and covers the nine districts of the State. The criterion for selecting these two crops is that these are the two important food crops in the State.

The statistical design adopted for crop cutting survey on paddy is a stratified multi-stage random sampling design with taluks as strata, villages within a stratum as first stage sampling units, fields within each selected village as sampling units at the second stage and finally plots of specified size (5 metre x 5 metre) in the selected field as the ultimate unit of sampling. Six villages are chosen in each stratum (Taluk) and in each chosen village, 3 plots are selected. Thus, in a taluk 18 experiments will be conducted during each paddy season.

In the case of tapioca, the survey is conducted in all the census villages selected for land utilization survey in each taluk. In each village, the list of dry land plots is used as the frame for this survey. From this list, one plot is selected with equal probability for conducting crop cutting experiment. The plot size for crop cutting was fixed as 2 x 2 metres. If the plot in a selected village does not satisfy the minimum requirement in respect of area for the purpose of experimentation the survey is not conducted in that village. The total number of experiments planned in each taluk is 15 in a year.

The sampling error of the mean yield of tapioca based on the surveys carried out during 1965-66 is not worked out since the number of experiments actually conducted is very much less.

### 3. Sample Size:

The district wise number of experiments planned for crop cutting survey on paddy during the year under review are given in Table 1. The total number of experiments planned for the survey during 1965-66 was 2247. The season-wise numbers are as given below.

*Total number of Experiments planned*

<i>Period</i>	<i>Virippu (Autumn)</i>	<i>Mundakan (Winter)</i>	<i>Punja (Summer)</i>	<i>Total</i>
1965-66	885	903	459	2247

The total number of experiments planned in the case of Tapioca during the year 1965-66 was 750. The district-wise number of experiments planned for the survey are given in Table 8

### 4. Field Organisation:

The field work of the surveys, comprising selection of fields, laying out of plots for crop cutting experiments harvesting the crop and recording the weight of produce after the usual processing, is carried out by the full-time staff appointed by this Department. The planning of the surveys, the training of field staff and a quality check of their work and the statistical analysis of the data collected are all done by the headquarters office of the Bureau. The field work is attended to by the Investigators under the immediate supervision of Statistical Inspectors and District Statistical Officers.

### 5. Training:

A programme of training is usually arranged every year to impart refresher training to the Investigators. The supervisory officers are also associated with the programme.

### 6. Response:

The number of experiments planned, analysed and the percentage response regarding paddy are given in table 3 and the corresponding figures for tapioca are given in table 9. The response for croppcutting survey on tapioca in several district is found to be very poor. The reason that can be given in this context is that as this survey was conducted along with the land utilization survey, the Investigators could not make frequent contacts with the selected cultivators, with the result that harvest in many plots were over when the Investigator visited the plot.

### 7. Supervision:

The supervision of the field work is done by the Statistical Inspectors, Senior Research Assistants, and District Statistical Officers. Since 1964-65 a fixed programme for inspection at harvest stage in the case of paddy crop cutting experiments was arranged so that in each taluk 5 out of 18 experiments are to be inspected at harvest stage during each paddy season at the rate of three experiments by the Statistical Inspector, one by the Senior Research Assistant and one by the District Statistical Officer. Besides they are instructed to conduct as many pre-harvest and post-harvest inspections as possible. The N.S.S. staff also conducted harvest stage inspections in State samples. Details of harvest stage inspection and the estimate of average yield of Paddy based on the harvest stage inspection plots are given in Table 2.

### 8. Results:

The survey estimates of average yield and total production together with sampling error for Paddy are given in table 4.

In two districts which are covered by I.A.D.P. in the State viz. Alleppey and Palghat, the mean yield of dry paddy obtained on the basis of experiments conducted under state series and under I.A.D.P. series are pooled together to get the final estimated production of rice in those two districts. The yield rates and production obtained through the two series of experiments and the pooled estimates thereof are given in table 5.

The estimates of yield rate of tapioca and the total production (raw) are given in table No. 10. The sampling errors for the average yield of tapioca have not been estimated as the number of experiments conducted is very small in each taluk.

The survey results have been adopted for framing the final estimates of production. The results of the experiments conducted for ascertaining the percentage recovery of paddy (dry grain) from the harvested produce are also given in table 6. The ratios are, in practice, worked out and applied at the taluk level.

The statement showing the percentage of area under different improved agricultural practices during each of the 3 paddy seasons are given in tables 7A, 7B and 7C.

## LIST OF TABLES AND APPENDICES

## CROP I—PADDY

Table: 1	Coverage and Sample Size - Rice
Table: 2	Supervision of Field work - Rice
Table: 3	Response
Table: 4	Yield Estimates
Table: 5	Pooled Estimates of yield and production of Rice
Table: 6	Ancillary data on driage (Percentage recovery of final from harvested produce) and yield from irrigated and un-Irrigated plots.
Table 7 A } 7 B } 7 C }	Statement showing percentage of area under different improved Agricultural practices.

## CROP II - TAPIOCA

Table 8:	Crop coverage and Sample size
Table 9:	Response
Table 10:	Yield Estimates

TABLE: I  
**Crop Coverage and Sample Size—Rice**

DISTRICT	Total Number of Experiments planned 1965-66			Total
	Autumn	Winter	Summer	
1. Trivandrum	72	72	..	144
2 Quilon	108	108	48	264
3. Alleppey	126	108	108	342
4 Kottayam	78	93	63	234
5 Ernakulam	126	108	72	306
6 Trichur	90	90	78	258
7 Palghat	108	108	18	234
8 Kozhikode	90	108	18	216
9 Cannanore	87	108	54	249
STATE	885	903	459	2247

TABLE 2

## SUPERVISION OF FIELD WORK

## Rice 1965-66

(1)	(2)	(3)	No. of Experiments		Yield rate of paddy Kgs./Hect.		(8)
			Planned for inspection at harvest stage	Inspected at harvest stage	Before Drriage	After Drriage	
1.	Trivandrum	Autumn	20	18	2693	2397	.89
		Winter	20	17	2219	2019	.91
		Summer	..	..	..	..	..
2.	Quilon	Autumn	30	27	2229	2006	.90
		Winter	30	13	2401	2209	.92
		Summer	10	6	2224	2002	.90
3.	Alleppey	Autumn	35	33	2283	2032	.89
		Winter	30	28	1612	1331	.95
		Summer	25	7	2112	1880	.89
4.	Kottayam	Autumn	27	25	1860	1600	.86
		Winter	35	27	1361	1211	.89
		Summer	20	14	1650	1535	.93
5.	Ernakulam	Autumn	35	31	1752	1577	.90
		Winter	30	29	2190	1949	.89
		Summer	20	20	2492	2243	.90
6.	Trichur	Autumn	25	19	1783	1551	.87
		Winter	25	14	1714	1577	.92
		Summer	25	8	1914	1723	.90
7.	Palghat	Autumn	30	24	2797	2377	.85
		Winter	30	29	2212	2057	.93
		Summer	5	1	2000	1860	.93



8.	Kozhikode	Autumn	25	20	1380	1283	.93
		Winter	30	22	1618	1537	.95
		Summer	5	4	2228	2072	.93
9.	Cannanore	Autumn	25	16	1758	1653	.94
		Winter	30	6	2088	1921	.92
		Summer	10	5	1512	1300	.86
	STATE	Autumn	252	213	2112	1880	.89
		Winter	260	183	1955	1799	.92
		Summer	120	65	2020	1818	.90

TABLE 3

## Response—Crop—Paddy 1965-66

DISTRICT	AUTUMN				WINTER				SUMMER				TOTAL		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)		
														No. of experiments Planned	No. of experiments Analysed
Trivandrum	72	65	90	72	63	88	..	..	..	..	144	128	89		
Quilon	108	100	93	108	100	93	48	31	65	65	264	231	88		
Alleppey	126	114	90	108	102	94	108	97	90	90	342	313	92		
Kottayam	78	76	97	93	87	94	63	61	97	97	234	224	96		
Ernakulam	126	110	87	108	97	90	72	69	96	96	306	276	90		
Trichur	90	81	90	90	70	78	78	62	79	79	258	213	83		
Palghat	108	95	88	108	97	90	18	13	72	72	234	205	88		
Kozhikode	90	85	94	108	98	91	18	12	67	67	216	195	90		
Cannanore	87	75	87	108	99	92	54	51	94	94	249	225	90		
STATE	885	801	91	903	813	90	459	396	86	86	2247	2010	89		

TABLE 4

## Yield Estimate—Rice—1965-66

DISTRICT	Area under Crop (Hectares)		No. of experiments					Estimated yield per Hectare Paddy (Kg.)	Sampling error (Percentage)	Total production (Rice in Tonnes)
	Total	Coverage (Percentage)	Planned	Analysed	Response (Percentage)	6	7			
Trivandrum	18965	100	72	65	90	2274	5.15	28330		
	19769	"	72	63	88	1913	6.06	24848		
Quilon	21317	100	108	100	93	1910	3.04	26747		
	27479	"	108	100	93	1929	4.20	34828		
Alleppey	841	"	31	31	65	1803	11.31	996		
	21991	"	126	114	90	2011	4.33	29064		
Kottayam	17537	"	108	102	94	1649	4.97	18999		
	42075	"	108	97	90	1742	5.80	48167		
Ernakulam	6849	"	78	76	97	1700	3.88	7650		
	19364	"	93	87	94	1334	4.35	16973		
Trichur	14317	"	63	61	97	1395	6.45	13118		
	42110	"	126	110	87	1605	4.49	44418		
Palghat	36033	"	108	97	90	1760	2.84	41663		
	5317	"	72	69	96	2090	8.42	7302		
Kozhikode	38927	"	90	81	90	1514	10.24	38722		
	61076	"	90	70	78	1806	4.82	72490		
Cannanore	8804	"	78	62	79	1938	7.53	11213		
	115563	100	108	95	88	2680	1.46	203464		
STATE	76760	"	108	97	90	2203	5.86	111104		
	2798	"	18	13	72	2094	6.59	3849		
STATE	65869	"	90	85	94	1455	4.12	62990		
	43222	"	108	98	91	1592	5.68	43503		
STATE	1102	"	18	12	67	1912	2.09	1384		
	66421	"	87	75	87	1867	3.64	81495		
STATE	26639	"	108	99	92	1493	3.91	25077		
	1184	"	54	51	94	1314	9.97	1022		
STATE	396012	"	885	801	91	2000	1.40	522880		
	327879	"	903	813	90	1808	2.16	389485		
STATE	76438	"	459	396	86	1733	3.58	87051		
		"								

TABLE 5

## Pooled Estimates of Mean Yield and Production of Rice

DISTRICT	(1)	(2)	AUTUMN 1965		WINTER 1966		SUMMER 1966		TOTAL	
			Mean yield of dry paddy Kgs./Hect.	Production Rice in Tonnes	Mean yield of dry Paddy Kgs./Hect.	Production Rice in Tonnes	Mean yield of dry paddy Kgs./Hect.	Production Rice in Tonnes	Mean yield of dry paddy Kgs./Hect.	Production Rice in Tonnes
ALLEPPEY		State Series	2011	29064	1649	18999	1742	48167	1795	96230
		I.A.D.P. Series	1846	26671	1571	18101	1686	46607	1704	91379
		Pooled	1892	27336	1593	18354	1697	46910	1727	92600
PALGHAT		State Series	2680	203464	2203	111104	2094	3849	2489	318417
		I.A.D.P. Series	2726	206971	2225	112328	N.A.	N.A.	2527	319299
		Pooled	2689	204162	2223	112109	2094	3849	2503	320120
STATE		State Series	2000	522880	1808	389485	1733	87051	1896	999416
		Pooled	1996	521850	1810	389845	1708	85794	1892	997489

Summer Paddy is not cultivated in Package area of Palghat District.

TABLE 6

Data on Driage (Percent recovery of final from harvested produce) and Yield from irrigated and unirrigated plots-Rice-1965-66

DISTRICT	Driage Experiments				Data on Irrigation			
	(1)	(2)	(3)	(4)	Irrigated plots		Unirrigated plots	
					No.	Yield (dry paddy) Kg./Hect.	No.	Yield (dry paddy) Kg./Hect.
Trivandrum	Autumn	12	10	89	32	2418	33	2016
	Winter	12	12	91	12	2079	51	1881
	Summer	..	..	..	..	..	..	..
Quilon	Autumn	18	13	90	3	1668	97	1898
	Winter	18	12	92	5	1812	95	2018
	Summer	3	3	90	17	1795	14	1461
Alleppey	Autumn	21	21	89	2	2633	112	2017
	Winter	18	15	95	22	1337	80	1679
	Summer	18	13	89	63	1749	34	1595
Kottayam	Autumn	13	10	86	10	1278	66	1783
	Winter	18	18	89	46	1449	41	1492
	Summer	12	10	93	51	1256	10	1625
Ernakulam	Autumn	21	15	90	19	1727	91	1601
	Winter	18	9	89	53	1721	44	1640
	Summer	12	11	90	62	1873	7	1788
Trichur	Autumn	15	11	87	12	994	69	1462
	Winter	15	14	92	22	1749	48	1592
	Summer	13	10	90	45	1820	17	2510

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Palghat	Autumn	18	85	55	2777	40	2961
	Winter	18	93	81	2100	16	2199
	Summer	3	93	13	2098	..	..
Kozhikode	Autumn	15	95	10	1708	75	1881
	Winter	18	95	7	1229	91	1337
	Summer	3	93	12	1867	..	..
Cannanore	Autumn	15	94	..	..	75	1779
	Winter	18	92	52	1766	67	1243
	Summer	9	86	31	1615	20	1078
STATE	Autumn	148	89	143	2203	658	1781
	Winter	153	92	280	1768	533	1636
	Summer	73	90	294	1710	102	1662

TABLE 7A

Statement showing the percentage of area under different improved Agricultural Practices

State : KERALA

Year : 1965

Season : Autumn

Crop : Paddy

District	Percentage area under								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Improved seed	Local seeds	Chemical fertilizer	Other manure	Not measured	Treatment of insecticides	Untreated by pesticides	Remarks	
Trivandrum	18.22	81.78	88.02	11.98	..	20.71	79.29		
Quilon	3.20	96.80	69.04	23.58	7.38	1.61	98.39		
Aleppy	17.86	82.14	45.26	40.95	13.79	29.24	70.76		
Kottayam	9.08	90.92	57.78	36.19	6.03	23.29	74.71		
Ernakulam	4.18	95.82	43.86	41.03	15.11	12.09	87.91		
Trichur	3.19	96.81	25.48	66.13	8.39	27.61	72.39		
Palghat	6.57	93.43	39.43	56.53	4.04	9.94	90.06		
Kozhikode	4.53	95.47	12.30	87.70	..	1.78	98.22		
Cananore	..	100.00	21.89	72.11	6.00	20.22	79.78		
STATE	5.59	94.41	33.66	58.49	5.85	13.66	86.34		

TABLE 7B

Statement showing the percentage of area under different improved Agricultural Practices  
 State : KERALA  
 Crop : Paddy  
 Year : 1966  
 Season : Winter

District	Percentage area under								
	Improved seed	Local seeds	Chemical fertiliser	Other manure	Not manured	Treatment of insecticides	Untreated by pesticides	Remarks	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(9)
Trivandrum	20.44	79.56	82.34	17.66	..	58.13	41.87		
Quilon	46.03	53.97	83.34	15.69	0.97	5.82	49.18		
Alleppey	38.28	61.72	66.14	31.52	2.34	23.22	76.78		
Kottayam	2.94	97.06	74.52	24.17	1.31	42.03	57.97		
Ernakulam	10.15	89.85	44.21	51.17	4.62	41.34	58.65		
Trichur	14.79	85.21	38.02	60.26	1.72	29.57	70.43		
Palghat	23.05	76.95	54.77	44.01	1.22	17.14	82.86		
Kozhikode	1.63	98.37	23.17	68.44	8.39	5.36	94.64		
Cannanore	0.76	99.24	37.74	61.50	0.76	20.96	79.04		
STATE	16.85	83.15	50.77	46.66	2.57	24.19	75.81		



TABLE 7C

State : KERALA  
 Statement showing the percentage of area under different improved Agricultural Practices  
 Year : 1966  
 Season : Summer  
 Crop : Paddy

District	Percentage area under								
	Improved seed (2)	Local seed (3)	Chemical fertilisers (4)	Other manure (5)	Not manure (6)	Treatment of insecticides (7)	Untreated by pesticides (8)	Remarks (9)	
Trivandrum	..	..	..	..	..	..	..	..	
Quilon	..	100.00	49.11	14.82	36.07	39.68	60.92		
Alleppey	21.15	78.85	92.65	6.66	0.69	81.10	18.90		
Kottayam	5.49	94.51	99.02	0.98	..	92.32	7.68		
Ernakulam	16.49	83.51	76.16	18.72	5.12	61.52	38.48		
Trichur	1.29	98.71	65.70	34.30	..	46.15	53.85		
Palghat	..	100.00	100.00	..	..	..	100.00		
Kozhikode	..	100.00	50.00	50.00	..	50.00	50.00		
Cannanore	..	100.00	26.13	65.66	8.12	11.71	88.29	27.13	
STATE	13.97	86.03	87.74	12.71	1.26	72.87			

TABLE : 8

## Crop coverage and Sample size Tapioca

<i>District</i>	<i>Total No. of Experiments Planned—1965-66</i>
Trivandrum	45
Quilon	90
Alleppey	75
Kottayam	120
Ernakulam	90
Trichur	75
Palghat	90
Kozhikode	90
Cannanore	75
Total No. of experiments Planned	750

TABLE 9

## Response—Crop—Tapioca—1965-66

<i>District</i>	1965-66 <i>No. of experiments</i>		<i>Percentage response</i>
	<i>Planned</i>	<i>Analysed</i>	
Trivandrum	45	35	78
Quilon	90	63	70
Alleppey	75	40	53
Kottayam	120	71	59
Ernakulam	90	40	44
Trichur	75	38	51
Palghat	90	9	10
Kozhikode	90	22	24
Cannanore	75	3	4
STATE	750	321	43

TABLE 10  
Yield Estimates - Tapioca (1965-66)

District	Area under crop		No. of experiments		Response Percentage	Estimated yield/Hectare (Tonnes)	Sampling error	Total production Tonnes
	Total area (Hectares)	Coverage Percentage	Planned	Analysed				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Trivandrum	53844	100	45	35	78	14.09	..	758662
Quilon	57599	100	90	63	70	12.07	..	695220
Alleppey	23035	100	75	40	53	15.16	..	349211
Kottayam	43815	100	120	71	59	17.25	..	755809
Ernakulam	13568	100	90	40	44	11.44	..	155218
Trichur	4137	100	75	38	51	11.31	..	46789
Palghat	6476	100	90	9	10	10.35	..	67027
Kozhikode	19687	100	90	22	24	10.24	..	201595
Cannanore	7523	100	75	3	4	8.79	..	66127
STATE	229684	100	750	321	43	13.40	..	3095658



