GOVERNMENT OF KERALA

STATISTICS DEPARTMENT

REPORT ON THE CROP CUTTING SURVEY

ON

AUTUMN CROP OF PADDY 1971

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REPORT ON THE CROP CUTTING SURVE
CROP OF PADDY 1971.

1. **Introduction** :

This report deals with the Crop Cutting Survey cc
crop of paddy 1971. The important aspects of the
in the following paragraphs.

2. **Object of the survey** :

The main object of the survey was to estimate taluk-wise mean yield of dry paddy per hectare and also the total production of rice in the state during the Autumn season 1971.

3. **Period of the survey** :

The survey on Autumn crop was conducted during the months of August to October 1971.

4. **Coverage** :

The survey covered 52 taluks out of 56 taluks in the state.

5. **Sample design** :

The method of sampling adopted for the survey was stratified multi-stage random sampling as in the case of the previous year. The taluk was taken as the stratum, a Census Village as the first stage unit, a survey sub-division number as the second stage unit, a kandom as the third stage unit and a square plot of side 5 metres as the ultimate sampling unit. From each taluk six census Villages were selected with equal probability. From each of these selected Villages, a systematic sample of 3 survey sub-division numbers was selected from a frame consisting of the cumulative number of wet land survey sub-divisions. In survey sub-divisions having more than one kandom, one kandom was selected for the survey by the method of simple random sampling for the Crop Cutting experiment, after the kandoms in the survey number were serially numbered beginning from the south-west corner and proceeding anti-clock wise. A square plot of side 5 metres was located at random in the selected kandom. The crop in the square plot was harvested, threshed, winnowed and weighed. A sample of grain from every 5th plot harvested was forwarded to the District Statistical Officer for conducting driage experiments for estimating the loss due to driage.

6. **Sample Selection** :

The selection of Villages in each taluk was done by the concerned District Statistical Officer and the list of Selected Villages was forwarded to the concerned Statistical Inspectors. The selection of plots was done by the Statistical Inspector.

7. **Field work :**

The field work was attended to by the Investigators under the supervision of the Statistical Inspectors and Dist. Statistical Officers.

Eventhough 930 experiments were planned for the Autumn season of 1971, only 784 experiments could be conducted, the percentage response being 84.3. The loss in the number of experiments was due to prior harvests without intimation to the primary workers.

Inspections were carried out by the Officers of this Department at three stages viz., Pre-harvest, harvest and post harvest stages. 127 Inspections were conducted in the Pre-harvest stage and 195 at harvest stage, and 15 at post harvest stage. The percentage of inspection at the harvest stage to the total number of experiments conducted was 24.9%. The overall percentage of inspection came to be 43.

8. **Results :**

The analysis of the data was done at the Head Office of the Bureau of Economics and Statistics, Trivandrum. The area under paddy in each taluk obtained from the L.U.S. was used to estimate the production figures. The final estimates are presented in the following tables.

TABLE I

Taluk-wise figures relating to the number of experiments conducted, the area under the crop, estimated mean yield of dry paddy per hectare, its standard error and out turn of cl aned rice are given in this table. Comparing with the Autumn season of 1970 both the average yield of dry paddy per hectare (pooled estimate) for the state and the total production (pooled estimate) of rice during, Autumn 1971 have increased by 2%.

TABLE II

This gives District-wise estimates of mean yield in "Irrigated" plots, chemically manured plots" Irrigated and manured" plots and "neither irrigated nor manured" plots. There were no plots with irrigation alone as the Autumn crop is usually a rainfed crop. 56% of the plots received chemical manures alone and 19% received both irrigation and chemical manures. The remaining 25% of plots were neither irrigated nor manured.

The Frequency distribution of plot yields is given in table III. The analysis of variance of plot yields is given in table IV.

Table V gives the results of driage experiments relating to the Autumn crop 1971 viz., the number of driage experiments conducted in each District and the driage ratio.

The yield rate of paddy during Autumn season in each taluk for the last 5 years are given in table VI for the purpose of comparison

9. Procedure of estimation:

(*i*) *Mean yield*:—The mean yield of dry paddy and its standard error for each taluk are calculated by adopting the following formula.
ni=number of cuts taken in the ith village (i=1, 2 . . . . . K, where K is the number of villages selected in the taluk)
xij=weight of paddy taken from the jth cuts in the ith village/kara (j=1, 2 , ni)

$$\text{Taluk mean} = \bar{x} = \frac{\sum_{i=1}^{k} \sum_{j=1}^{ni} xij}{\sum_{i=1}^{k} ni}$$

Each cut is taken from $\left(\frac{1}{400}\right)^{th}$ of a hectare. Mean yield of dry paddy in Kg./hect. $=\bar{x} \times 400 \times d$ where d is the driage ratio of dry paddy to wet paddy.

(*ii*) *Standard error (S.E.) of the taluk mean yield.*—

A=Mean square with in karas
B=Mean square between karas
N=Total number of experiments,

$$\left(\sum_{i-1}^{k} ni \right)$$ in the taluk

ni=number of experiments in the ith village/kara

Let $m = \frac{N^2 - \Sigma ni^2}{N\,(K-1)}$ where K is the number of the villages selected in the taluk

Variance of the taluk mean yield $= \frac{A}{N} + \frac{B-A}{ni} \times \frac{\Sigma\, ni^2}{N^2}$

The standard error (SE) is the square root of this variance. The S.E. in Kg./hect. is obtained by multiplying this root of variance with 400.

(*iii*) *Standard error of the State Mean yield.*— If ai is the area under the crop in the ith taluk and si the S.E. of the estimate in the taluk, S.E. for the state mean yield $= \sqrt{\frac{\Sigma\, (aisi)^2}{(\Sigma\, ai)^2}}$

10. The weight of cleaned rice is reckoned as 65.7% of dry paddy and accordingly the total production of rice in the state during Autumn season of 1971 was estimated as 552246 tonnes.

11. In Alleppey and Palghat Districts both state series and Intensive Agricultural District Programme series of experiments were conducted during

the season under report. The results obtained from the two series of experiments were pooled together and the pooled mean yield of dry paddy per hectare was calculated. The pooled average yield of dry paddy during Autumn crop 1971 in Alleppey and Palghat Districts were 1713 Kg./Hect. and 2910 Kg./Hect. respectively.

The average yield estimated from the State series of experiments alone for Alleppey and Palghat Districts were 1824 Kg./Hect. and 2740 Kg./Hect. respectively. The average yield estimated from I.A.D.P. series of experiments for Alleppey and Palghat Districts were 1679 Kg./Hect.and 2985 Kg./Hect. respectively.

The production of rice during Autumn 1971 as per the pooled estimate is 23132 tonnes in Alleppey District and 195567 tonnes in Palghat District. The corresponding figures obtained through State series are 24639 tonnes in Alleppey District and 184162 tonnes in Palghat District. The State production as per the pooled estimate was 552246 tonnes of rice.

For the purpose of comparison of the estimates of area under paddy, yield rate and production of cleaned rice during the different seasons of the past six years are given in the Statement 'A'.

(Sd.)
DIRECTOR

Trivandrum,
-12-1972.

STATEMENT 'A'

Area Mean ield and production of rice in Kerala during the period 1966-67 to 1971-72 (pooled) estimate of state series and I. A. D. P. series of experiments)

AGRICULTURAL YEAR.	Virippu (Autumn crop)			Mundakan (Winter crop)			Punja (Summer crop)			Total		
	Area in Hect.	Mean yield of dry paddy Kgs./Hect.	Production of rice in tonnes.	Area in Hect.	Mean yield of dry paddy Kgs./Hect.	Production of rice in tonnes.	Area in hect.	Mean yield of dry paddy Kgs./Hect.	Production of rice in tonnes	Area in Hect.	Mean yield of dry paddy Kgs./Hect.	Production of rice in tonnes
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1966-67	395083	1919	498160	327180	2192	471114	77175	2264	114788	799438	2064	1084062
1967-68	398993	1987	521023	327409	2185	470101	83142	2431	132773	809544	2113	1123897
1968-69	394879	2009	521258	380620	2286	571748	98372	2450	158348	873871	2179	1251354
1969-70	393747	2016	521443	382171	2097	526570	98141	2767	178400	874059	2136	1226413
1970-71	394798	2077	538886	381971	2259	566934	98061	2984	192185	874830	2259	1293005
1971-72	395298	2126	552246	381971	2378	596808	97838	3151	202684	875157	2351	1351738

TABLE I

CROP CUTTING RESULTS

Autumn Crop of Paddy 1971

	Taluk and District	No. of experiments	Area in Hect.	Mean yield of dry paddy Kg./Hect.	S. E. of the mean yield	Production of rice in tonnes
	(1)	(2)	(3)	(4)	(5)	(6)
1.	Neyyattinkara	16	5833	2769	531	10612
2.	Trivandrum	17	4264	2474	216	6931
3.	Nedumangad	17	4772	1870	294	5863
4.	Chirayinkil	18	3593	2711	270	6400
	TRIVANDRUM DISTRICT	68	15462	2457	197	29806
5.	Quilon	18	2947	1632	224	2637
6.	Kottarakkara	18	6331	1670	95	6946
7.	Kunnathur	15	4012	2222	304	5857
8.	Pathanapuram	16	4356	2265	90	6482
9.	Pathanamthitta	15	1118	2638	172	1937
10.	Karunagappally	18	2560	1760	167	2960
	QUILON DISTRICT	100	21324	1914	76	26819
11.	Karthikappally	9	5623	2209	294	8161
12.	Mavelikkara	10	3812	1928	258	4829
13.	Chengannur	14	1970	2433	346	3149
14.	Thiruvalla	13	1827	2985	193	3583
15.	Kuttanad	13	530	1643	519	5172
16.	Ambalapuzha	13	846	1267	442	704
17.	Sherthallai	17	5946	932	149	3641
	ALLEPPEY DISTRICT	89	20554	1824	112	24639
18.	Chenganacherry	18	1818	2783	399	3324
19.	Kanjirappally	11	50	2333	185	77
20.	Peermade	..	..	..	..	..
21.	Kottayam	18	2413	1959	113	3106
22.	Vaikom	9	1441	1610	186	1524
23.	Meenachil	13	1904	2902	256	3630
24.	Deviculam	3	272	2235	..	399
25.	Udumbanchola	...	..	..	..	..
	KOTTAYAM DISTRICT	72	7898	2324	120	12060

	(1)	(2)	(3)	(4)	(5)	(6)
26.	Thodupuzha	16	3822	2524	268	6338
27.	Moovattupuzha	17	7589	2015	297	10046
28.	Cochin	17	3208	2102	243	4430
29.	Kanayannur	16	8043	1949	223	10299
30.	Kunnathunad	17	7610	1525	121	7624
31.	Aiwaye	14	7042	2031	152	9396
32.	Parur	14	3679	1415	149	3420
	ERNAKULAM DISTRICT	111	40993	1914	85	51553
33.	Crangannore	13	377	1159	226	287
34.	Mukundapuram	16	8789	2085	392	12040
35.	Trichur	13	9321	1693	126	10367
36.	Thalappally	17	17025	1776	234	19865
37.	Chowghat	16	3600	1228	242	2904
	TRICHUR DISTRICT	75	39112	1769	139	45463
38.	Chittur	12	20786	2504	372	34196
39.	Alathur	16	20289	3795	233	50587
40.	Palghat	18	26463	3293	100	57263
41.	Ottappalam	18	27931	1992	149	36555
42.	Mannarghat	18	6822	1243	75	5571
	PALGHAT DISTRICT	82	102291	2740	101	184162
43.	Perinthalmanna	18	13141	2023	364	17466
44.	Ponnani	10	7083	2205	132	10261
45.	Tirur	15	16512	2457	137	16969
46.	Ernad	18	21283	2223	226	31084
	MALAPPURAM DISTRICT	61	52019	2217	134	75780
47.	Kozhikode	15	8505	1331	120	7437
48.	Quilandy	17	11346	1041	138	7760
49.	Badagara	16	6897	1629	173	7381
50.	South Wynad	..	..	..	..	..
	KOZHIKODE DISTRICT	48	26748	1285	82	22578
51.	North Wynad	..	..	..	..	..
52.	Tellicherry	18	9389	955	49	5841
53.	Cannanore	16	9860	2331	242	15100
54.	Taliparamba	15	10238	1573	147	10580
55.	Hosdurg	15	13361	1167	90	10244
56.	Kasargode	14	23109	1826	133	27723
	CANNANORE DISTRICT	78	65897	1605	67	69488
	STATE	784	395298	2088	39	542348

TABLE II

AUTUMN CROP OF PADDY 1971 IN KERALA STATE

District-wise yield data from irrigated, chemically manured, combined and Central plots

District	Irrigated plots		Chemically manured plots		Irrigated and manured plots		Neither irrigated nor manured plots	
	No. of experiments	Mean yield of dry paddy in Kgs./Hect.	No. of experiments	Mean yield of dry paddy in Kgs./Hect.	No. of experiments	Mean yield of dry paddy in Kgs./Hect.	No. of experiments	Mean yield of dry paddy in Kgs./Hect.
Trivandrum	..	..	57	2463	11	2596	..	..
Quilon	..	..	75	2078	25	1588	..	..
Alleppey	..	..	54	2328	21	1155	14	1138
Kottayam	..	..	56	2567	13	1784	3	1201
Ernakulam	..	..	67	2038	16	1676	28	1830
Trichur	..	..	25	1952	46	1424	4	1448
Palghat	..	..	52	2924	4	1844	26	1916
Malappuram	..	..	26	2852	..	..	35	1838
Kozhikode	..	..	7	1745	15	1030	26	1379
Cannanore	..	..	21	1661	2	956	55	1625
STATE	..	..	440	2328	153	1521	191	1661

TABLE III

AUTUMN CROP OF PADDY 1971

Frequency Distribution of Plot yields

Sl. No.	Range of yield of paddy in Kg./Hect.	Frequency distribution	Percentage
1	Below 500	22	2.81
2	500-699	15	1.91
3	700-899	19	2.42
4	900-1099	39	4.98
5	1100-1299	46	5.87
6	1300-1499	54	6.89
7	1500-1699	65	8.29
8	1700-1899	58	7.40
9	1900-2099	50	6.38
10	2100-2299	62	7.91
11	2300-2499	58	7.40
12	2500-2699	53	6.76
13	2700-2899	35	4.46
14	2900-3099	38	4.85
15	3100-3299	36	4.59
16	3300-3499	27	3.44
17	3500-3699	15	1.91
18	3700-3899	19	2.42
19	3900-4099	19	2.42
20	4100 and above	54	6.89
	All	784	100.00

TABLE IV

AUTUMN CROP OF PADDY 1971

Analysis of variance of Plot yield poold for the State in Kgs² plot of $\frac{1}{400}$ of an hectare

Source of variation		Sum of squares	Degrees o Freedom	Variance
Between taluk	..	2610.23	50	52.20**
Between Kara within taluk	..	1883.77	249	7.56**
Within Kara within taluk	..	2104.61	481	4.37
Total	..	6598.61	780	

** Significant at 1% level.

TABLE V

THE RESULTS OF DRIAGE EXPERIMENTS

Autumn crop of paddy 1971

No.	Name of District	No. of experiments	Driage ratio (percentage)
(1)	(2)	(3)	(4)
1.	Trivandrum	12	89.9
2.	Quilon	18	89.6
3.	Alleppey	14	84.7
4.	Kottayam	12	87.3
5.	Ernakulam	19	80.6
6.	Trichur	14	83.0
7.	Palghat	15	85.4
8.	Malappuram	11	88.9
9.	Kozhikode	8	90.7
10.	Cannanore	15	86.6
	STATE	138	85.8

TABLE VI

MEAN YIELD OF DRY PADDY (KGS/HECT) DURING AUTUMN CROP OF PADDY

Sl. No.	Taluk and District	1967 Autumn Kgs/Hectare	1968 Autumn Kgs/Hectare	1969 Autumn Kgs/Hectare	1970 Autumn Kgs/Hectare	1971 Autumn Kgs/Hectare
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.	Neyyattinkara	2362	2253	2261	2471	2769
2	Trivandrum	1885	2390	1607	1840	2474
3.	Nedumangad	1749	1915	1761	1721	1870
4.	Chirayinkil	1748	1833	2019	2608	2711
	Trivandrum District	1981	2118	1934	2158	2457
5.	Quilon	1913	2173	1985	2014	1632
6.	Kottarakara	2158	1846	1886	1952	1670
7.	Kunnathur	2181	1222	1298	1527	2222
8.	Pathanapuram	2440	2141	1661	2017	2265
9.	Pathanamthitta	2033	2351	1655	2111	2638
10.	Karunagappally	1288	1836	1932	1754	1760
	Quilon District	2073	1859	1736	1878	1974
11.	Karthigappally	1555	1204	1435	1775	2209
12.	Mavelikkara	2446	1438	2013	2079	1928
13.	Chengannur	2346	1735	2383	2563	2433
14.	Thiruvalla	2130	1526	1160	2419	2985
15.	Kuttanad	2034	1677	1990	2100	1643
16.	Ambalapuzha	1698	1083	1030	1329	1267
17.	Sherthalai	1249	854	1043	956	932
	Alleppey District	1805	1230	1493	1717	1824
18.	Changancherry	1999	2325	2391	2232	2783
19.	Kanjirappally	1220	2325	2042	1915	2333
20.	Peermade	..	..	..	..	..
21.	Kottayam	2081	1663	1762	1908	1959
22.	Vaikom	1513	2033	1457	1724	1610
23.	Meenachil	1675	1691	2027	1975	2902
24.	Devicolam	2231	1771	2475	2461	2235
25.	Udumbanchola	..	..	..	..	..
	Kottayam District	1852	1897	1941	1934	2234

(1)	(2)	(3)	(4)	(5)	(6)	(7)
26.	Thodupuzha	1837	1715	1721	2042	2524
27.	Moovattupuzha	1720	1479	1562	1935	2013
28.	Cochin	3006	2070	1711	2214	2102
29.	Kanayannur	2201	1482	1513	1635	1949
30.	Kunnathunad	1877	1504	1810	1697	1525
31.	Alwaye	1837	2569	1940	2028	2031
32.	Parur	1668	1741	2119	2440	1415
	Ernakulam District	1970	1764	1740	1926	1914
33.	Cranganore	826	801	1016	1236	1159
34.	Mukundapuram	1075	1318	1806	2336	2085
35.	Trichur	1727	1968	1680	1788	1693
36.	Thalappally	2175	2089	2095	2103	1776
37.	Chowghat	1475	1302	941	1712	1228
	Trichur District	1747	1810	1829	2036	1769
38.	Chittur	3018	2852	1689	2397	2504
39.	Alathur	2631	2585	2406	3232	3795
40.	Palghat	2435	2621	3184	2267	3293
41.	Ottappalam	2513	1972	2717	2429	1992
42.	Mannarghat	..	..	..	1667	1243
	Palghat District	2462	2388	2574	2489	2740
43.	Perinthalmanna	2442	2104	2188	2517	2023
44.	Ponnani	1170	1803	1704	1698	2205
45.	Tirur	1265	1315	1133	1698	2457
46.	Ernad	1475	1726	1748	1856	2223
	Malappuram District	..	..	..	1969	2217
47.	Kozhikode	1523	1255	1435	1199	1331
48.	Quilandy	1378	1512	866	789	1041
49.	Badagara	1158	1362	1252	1044	1629
50.	South Wynad	..	..	..	..	..
	Kozhikode District	1373	1480	1328	984	1285

(1)	(2)	(3)	(4)	(5)	(6)	(7)
51.	North Wynad	..	..	..	..	..
52.	Tellicherry	1774	1497	2045	1001	953
53.	Cannanore	1423	1660	1425	1948	2331
54.	Taliparamba	1978	2358	2369	2104	1573
55.	Hosdurg	2070	1901	1918	2358	1167
56.	Kasaragode	1946	2358	2678	2304	1826
	Cannanore District	1874	2045	2197	2045	1605
	STATE	1972	1949	2006	2044	2088