

CROP ESTIMATION SURVEYS (STATE SERIES)

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**REPORT ON TYPE-2 STUDY ON PADDY,
ANDHRA PRADESH
1963-64**

F O R E W O R D

Official estimates of cereal production are framed on the basis of crop estimation surveys carried out by the State Governments under the technical guidance of the Directorate of National Sample Survey. Independent estimates of cereal production are also available since 1957-58, through crop surveys carried out as an integral part of the Socio-economic rounds organised by the Directorate of National Sample Survey. Wide divergences were noticed in the two sets of estimates of production based on the two series of surveys, necessitating a deeper probe of the reasons for such divergences. On the recommendation of a Technical Committee set up by the Planning Commission, type studies, designated type 2 studies, were organised on maize in Bihar and paddy in Andhra Pradesh during 1963-64. The present report deals with the results of study carried out on paddy in Andhra Pradesh.

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Report on Type 2 Study on Paddy in Andhra Pradesh, 1963-64

1. Introduction

1.1 Official estimates of production of crops are obtained for each state as a product of the acreage under the crops and the corresponding average yield rates. The acreage under crops is, mostly obtained through complete field to field enumeration by the village Patwaris of the Revenue Department while average yield rates are obtained through crop estimation surveys, the technique for which was originally developed by the Indian Council of Agricultural Research. The field work of these surveys is carried out by the staff of the Departments of Agriculture and/or Revenue as a normal departmental routine. The surveys are organised under the technical guidance of a unit located in the Directorate of National Sample Survey, largely designed to ensure uniformity in concepts, definitions and other details of the surveys carried out by the different states. The unit is also entrusted with the responsibility of consolidating the results of surveys for all-India purposes. These surveys which were initiated two decades ago on a pilot basis on rice and wheat, now cover all the principal food and non-food crops in the major States of the Union.

1.2 Since 1957-58, independent estimates of cereal production are also being made through crop surveys carried out as an integral part of the Socio-economic rounds, organised by the Directorate of National Sample Survey. This work is carried out under the technical guidance of the Indian Statistical Institute. They provide for estimation of both area and yield of cereals, through sampling

and are carried out by whole time adequately trained Investigators, on the basis of uniform concepts and definitions.

2. Recommendations of the Technical Committee

2.1 The two sets of estimates of production of cereals, one based on the State official series and the other on the NSS-ISI series of surveys were found to be widely divergent. A Technical Committee set up by the Planning Commission to examine the reasons for differences in the two sets of estimates, inter-alia recommended the following types of studies:-

Type 1: Joint crop cutting experiments by both techniques under very close and joint supervision of the two agencies, work being somewhat analogous to experiments conducted under laboratory conditions;

Type 2: Joint experiments by both techniques conducted under normal field conditions with provision for supervision as existing in the field at present; and

Type 3: Full scale sample survey to determine the area, rate of yield per acre and production of crops.

2.2 Type 1 studies: In accordance with the recommendations of the Technical Committee, Type 1 studies were organised during 1960-61 on jowar in Bundi (Rajasthan) and on wheat in Barh (Bihar). The results of the studies showed that under laboratory conditions, yield rates of crops obtained by the two techniques agreed closely in Bundi and Barh.

2.3 Type 2 studies: The technical Committee considered the results of the studies and recommended organisation of Type 2 studies along with the extended crop surveys of the 13th round of NSS (1963-64) on one crop in each of the States, as mentioned below:-

<u>S.No.</u>	<u>State</u>	<u>Crop</u>
1.	Andhra Pradesh	Paddy
2.	Biher	Maize
3.	Madhya Pradesh	Jowar
4.	Maharashtra	Bajra
5.	Uttar Pradesh	Wheat

2.4 The Technical Committee outlined the main objective as a comparative study of the estimates of yield rates obtained from the two types of procedures (State and NSS procedures) and recommended that it would be necessary to have, at the State level, paired comparisons of yield rates of the State and NSS cuts in about 200-300 fields. The Committee, further, recommended that it would be also essential to have arrangements made for harvesting of the whole fields selected for paired comparisons. In view, however, of the difficulties in organising whole field harvest, it was agreed that this aspect would not be insisted in districts or tracts where labour shortage was likely to be experienced. From the operational point of view, it would be preferable to select villages falling in the NSS sample for the study. Accordingly, a study was organised in Andhra Pradesh on paddy during the winter season of the 1963-64. The present report deals with the results of the study.

3. Details of design and related aspects

3.1 NSS adopts a stratified random sample for canvassing various enquiries. For purposes of stratification, the country is divided into a number of Agricultural regions by grouping districts within each State having similar crop pattern and population density. In all there were 48 agricultural regions. Strata were formed within each State by grouping tehsils within the same agricultural region and NSS State-block such that sum of the sizes of the villages in each stratum is exactly equal, the size being the 1951/61 Census of population of the villages, rounded off to the next higher multiple of one thousand. •

3.2 Sample villages: There were 28 such NSS strata in Anandra Pradesh. 24 villages in 4 sub-samples of 6 villages each were selected in each stratum, and crop cutting experiments were to be carried out only in villages bearing S.Nos. 1, 3 and 6 of sub-samples 1 and 2. Thus the NSS sample size for crop-cutting experiments was 168 villages. The State had also a programme of collaboration with the NSS on a matching basis. Thus the State and the Central NSS samples together accounted for 336 villages for crop cutting experiments. Since it was decided to have paired comparisons in about 100 villages and whole field harvest, in 50 villages, it was necessary to lay down a procedure for selection of this sub-sample. It was accordingly suggested that villages bearing S.No.3 in each sub-sample might be selected for type 2 study. This meant selection of 56 villages each from the State and Central NSS samples. As the sample villages for 1962-63 were repeated during 1963-64, it was possible to have an idea whether in at least 100 of these villages, paddy crop would be found during 1963-64.

3.2 Whole field harvest was proposed to be organised in 56 villages of the 112 villages. In view of the practical difficulties for whole field harvest operations, it was decided at a meeting of the representatives of the CSO, ISI, NSS and State Statistical Bureau, that 56 villages taken for the purpose should be those which had proper facilities for getting the equipment and to be easily accessible and where adequate facilities for labour, storage, threshing yards, co-operation of cultivators were available.

3.3 There was no substitution of villages. The final position on the number of villages selected is summarised

below:-

Sample	Sub-sample 1		Sub-sample 2		Total	
	Paired comparisons	Whole field harvest	paired comparisons	Whole field harvest	Paired comparisons	Whole field harvest
1	2	3	4	5	6	7
Central	28	15	28	13	56	28
State	28	13	28	15	56	23
Combined	56	28	56	28	112	56

3.4 Agency: The field work relating to the circular cut was carried out by the Investigators of the State and Central NSS, while the rectangular cuts were entrusted to the Revenue Inspectors and Agricultural Demonstrators, which was the normal agency for crop estimation surveys for the State non-NSS series. The whole field harvest was entrusted to 50 Field-men specially recruited for the purpose. They worked under the guidance of and were assisted by Progress Assistants, and Taluk Statistical Assistants.

3.5 Selection of fields: In each sample village, two fields growing paddy were selected by the State official procedure by the agency responsible for crop-cutting experiments on rectangular cut (non-NSS State). It was also the responsibility of the agency to secure the permission of the cultivators concerned and fix up dates of harvest for the selected fields. It was also required to make available to the NSS, both State and Central, all relevant particulars of the selected fields well ahead so that the two types of cuts were taken by the staff of the respective agencies on the same day.

3.6 Number of cuts: In each sample field one rectangular cut and one circular cut were conducted. The rectangular cut was of the size 50 links x 20 links (1/100 of an acre) while the circular cut consisted of two concentric circles of radii 2'-3" and 4' respectively.

3.7 Location and marking of cuts: Since both types of cuts were to be located in the same field, the following procedure was indicated for adoption by the field staff:-

- i) In the first field in each village, the circular cut would be located first and then the rectangular cut. Similarly, in the second field, the rectangular cut was first to be located and then the circular cut;
- ii) Over-lapping of the two types of cuts were to be avoided by selecting fresh pairs of random numbers.

3.8 Harvesting: The respective agencies viz. Revenue Inspectors and Agricultural Demonstrators for rectangular cuts and the Investigators for circular cuts were to supervise the harvesting to be done according to the procedure followed normally by them and record the weight of grain.

3.9 Driage: The produce from 2'-3" circle was retained by the Investigator for further processing while the produce from the rectangular cut was retained by the Agricultural Demonstrator/Revenue Inspector.

3.10 whole field harvest: Whole field harvest was arranged in both the fields in 56 villages where adequate facilities were available for labour, storage, threshing etc. verds, co-operation of cultivators, / The villages were also to be easily accessible. The harvesting operations of whole field were to be completed in a day in the presence of the representatives of different agencies. After the produce of the circular and rectangular cuts was removed, the remaining portion of the field was harvested. The produce along with the produce from the annular portion of the circular cut was stored for driage. Elaborate procedures were prescribed and followed for drying the produce of the whole field and recording the weight of dried grain.

4. Organisation of field work

4.1 The programme was directly under the administrative control of the Director, Bureau of Economics and Statistics, Andhra Pradesh. The sanction to the study was received during the second week of October, 1964, leaving very little time for completing the preliminary work well ahead of the commencement of harvesting of paddy. The schedules and instructions were finalised at a meeting held on the 9th and 10th September, 1963 among the representatives of the State Statistical Bureau, Central Statistical Organisation, Indian Statistical Institute and the National Sample Survey.

4.2 The scheme provided for the appointment of a full complement of staff consisting of 1 Superintendent, 6 senior Investigators, 50 Field-men and necessary clerical assistance. The original arrangement of obtaining the services on loan of experienced Field-men from the Directorate of Agriculture, Andhra Pradesh for their unit did not come off and consequently recourse was taken to the recruitment of fresh candidates to the posts of Field-men, necessitating the need for an intensive training before they were put on the field.

4.3 The District Statistical Officers, Senior Investigators, Progress Assistants, Taluk Statistical Assistants, Field-men as also Inspectors and Assistant Superintendents of the NSS were imparted training at 7 centres by the Assistant Director (SES) of the Bureau of Economics & Statistics and by the Superintendents and Assistant Statistician of the National Sample Survey. Simultaneously, training was organised and could, therefore, be completed in a short period of about 10 days from the 21st to 31st October, 1963. As all the Field-men did not

report before the commencement of training, subsequent training programme ^{had} necessarily to be arranged for the newly recruited staff at 3 centres.

4.4 Although the recruitment and training of staff took naturally some time, the field programme was not allowed to suffer on this account. Arrangements were made quickly to obtain the necessary co-operation from the State Departments like Revenue and Agriculture by issuing suitable instructions to the Collectors, District Agricultural Officers, District Surveyors and Block Development Officers to assist in the conduct of type 2 study. In order to avoid casualty, the selected villages were visited by the representatives of the participating agencies for selection of fields and for examining the suitability and facilities available for whole field harvest. The Field-men were available in the sample villages (for whole field harvest) immediately after their training, for ensuring all the preliminary work connected with the experiments. Harvesting of sample fields commenced in the first week of November, 1963 and lasted till the first week of February, 1964.

however, the bulk of the harvesting, more than 50 per cent of the sample fields, took place during a short interval of 3 weeks from 15th November, 1963 to 5th December, 1963.

4.5 Although Type 2 studies as envisaged provided only for the quantum of inspection normally exercised for both types of cuts, the introduction of whole field harvest in 56 out of the 112 villages largely enhanced the quantum of inspection at various stages of the field work. In all these 56 villages, one of the other of the supervisory officers from the State was present at the time of operations like harvesting, threshing, drying and recording the weight of grain. Besides there was intensive supervision

of the superior officers of the Central NSS and the Bureau of Economics & Statistics. In addition, technicians from Indian Statistical Institute inspected the work in 11 villages. The Regional staff of the Agricultural Statistics Division of the NSS which normally participates in the inspection of the field work of State official series visited 13 villages. Thus to a large extent, the normal field conditions did not obtain in this study but that was inevitable.

4.6 It may be recalled that the scheme provided for measuring separately the demarcated crop area and the all or bund relating to the sample fields and also for preparing a sketch map giving the actual measurements. The actual measurement was made by Taluk Surveyors in the Andhra Region and Measurement Circle Inspectors in the Telengana Region. The off-set method which was adopted, proved to be convenient and easy and at the same time accurate. According to the State Director of Bureau of Economics & Statistics, the areas on re-measurement by supervisory officers did not differ by more than one tenth of one per cent. Area of the bunds was calculated by measuring the width of the base of the bunds by using 2 spikes to get the recordings at 5 points on each side, and area of the bunds calculated on all the sides. Half the total area thus arrived, was recorded as the area under bund for each field.

4.7 According to the provisions of the scheme one set of forms for each of the circular, rectangular and whole field harvest was despatched to the following agencies:-

- i) Indian Statistical Institute, Calcutta;
- ii) Bureau of Economics & Statistics, Andhra Pradesh, Hyderabad;
- iii) Directorate of National Sample Survey, New Delhi; and
- iv) Institute of Agricultural Research Statistics, Ministry of Food & Agriculture, New Delhi.

4.8 Receipt of forms was spread over more than 7 months. The first batch was received during the first week of November, 1963. The bulk of the schedules was received by the end of March, 1964, although they continued to be received in small batches till about third week of August, 1964. In quite a few cases repeated references were necessary to the State & Central field agencies in regard to the despatch of the schedules.

4.9 Of the 112 villages selected for paired comparisons, experiments could not be carried out in 15 villages due mostly to the fact that there was no paddy crop in the sample villages (12). In one village, the crop in the sample fields was harvested by the cultivator ahead of the date fixed for harvesting with-out prior intimation to the State field staff. In 2 other villages, experiments were lost because the primary worker failed to report the date fixed for harvest. In the case of 5 other villages, the work of rectangular cut was carried out by the representative of District Statistical Officer as the Agricultural Assistant or the Revenue Inspector entrusted with the work was not present on the scheduled date. It is, however, heartening to note that all the experiments in villages selected for whole field harvest were carried ^{out} without any mishap. The final position regarding the villages where experiments were carried out is summarised below:

Table O.1: Number of villages planned, reported and analysed

Sub-sample	Total number of villages planned		Total number of villages reported		Total number of villages analysed	
	Paired cuts	Whole field harvest	Paired cuts	Whole field harvest	Paired cuts	Whole field harvest
1	2	3	4	5	6	7
Central 1.	28	15	24	15	24	15
2.	28	13	23	13	23	13
Total	56	28	47	28	47	28
State 1.	28	13	23	13	23	13
2.	28	15	27	15	27	15
Total	56	28	50	28	50	28
All Sample	112	56	97	56	97	56

4.10 A detailed scrutiny of filled-in schedules was undertaken by the National Sample Survey. In quite a few cases, schedules received were found to be incomplete and consequently reference was made to the field staff for clarification. The Directorate also arranged for a joint verification and re-conciliation of the primary data sheets prepared, from the schedules received at headquarters with the corresponding information available at ISI.

5. Results

5.1 The data collected in the study lend themselves to analysis in two different groups of villages:

- i) All villages, where the whole field harvest was undertaken in addition to the rectangular and circular cuts; and
- ii) All villages, where only rectangular and circular cuts were organised.

For the first set of villages, paired comparisons are possible between whole field and rectangular cuts, whole field and circular cuts and rectangular and circular cuts. It will be recalled that the weight of green produce was not taken in the case of whole fields. Hence all comparisons relate to dried grain (rice in husk). For circular cuts, the ratio of dried grain to green paddy obtained in respect of produce from circular cuts of radius 2'-3" was applied to the produce from the circular cut of 4' radius for obtaining the weight of dried grain. Before making comparisons, individual plot yields were reduced to kcms per acre, using appropriate conversion factors. In the case of whole field, the area under crop excluding the area under ails or bunds only was considered. All comparisons relate to gross un-adjusted yield rates. The table below gives the average yield rates in kcms per acre in respect of the whole fields, rectangular cuts and circular cuts for the first group of villages. It also

gives the sampling errors absolute as well as percentage separately for each of the sub-sample, State and Central and all samples together.

Table O.2: Average yield rates of paddy with sampling errors for whole field, rectangular and circular cuts
(Whole field sample)

WHOLE FIELD				
Sub-sample	Sample size	Average yield in kgs/acre	Sampling error	
1	2	3	in kgs/acre	Percentage
			4	5
<u>Central</u> 1.	30	960.06	64.89	6.76
2.	26	867.82	97.56	11.24
<u>Total</u>	56	917.23	56.89	6.20
<u>State</u> 1.	26	920.69	88.39	9.60
2.	30	826.10	76.54	9.27
<u>Total</u>	56	870.01	57.83	6.65
<u>All combined</u>	112	893.62	40.44	4.53
RECTANGULAR CUT				
<u>Central</u> 1.	30	952.17	77.78	8.17
2.	26	868.64	92.65	10.67
<u>Total</u>	56	913.39	59.60	6.53
<u>State</u> 1.	26	922.46	89.39	9.69
2.	30	785.97	80.47	10.24
<u>Total</u>	56	849.34	60.00	7.06
<u>All combined</u>	112	881.37	42.20	4.79
CIRCULAR CUT				
<u>Central</u> 1.	30	1017.73	73.06	7.18
2.	26	930.92	86.25	9.27
<u>Total</u>	56	977.42	55.79	5.71
<u>State</u> 1.	26	942.28	87.74	9.31
2.	30	834.97	80.29	9.62
<u>Total</u>	56	884.79	59.14	6.63
<u>All combined</u>	112	931.11	40.71	4.37

It is seen that the average yield of paddy is estimated at 894, 881 and 931 kgms per acre respectively on the basis of whole field, rectangular and circular cuts. The average yield is the lowest for rectangular cut and highest for the circular cut. In terms of percentages the average yield rate for rectangular cut is lower than the average yield rate from the whole field by 1.5 per cent, while the average yield from circular exceeds the one for whole field harvest by 4 per cent. It is interesting to note that the average yield rates from circular cut are consistently higher than the ones for rectangular cuts and whole field harvest for all sub-samples, whereas no such consistency is seen in the comparisons of yield rates from whole field harvest and rectangular cuts.

5.2 An attempt has been made to test whether the differences observed are statistically significant. The results of the analysis are presented in the Table 0.3.

5.3 Individual differences between yield rates of whole field and rectangular cuts, whole field and circular cuts and rectangular and circular cuts are obtained for each village, cumulated and averaged over all fields for group 1 villages. The table also furnishes sampling errors of the mean differences and also the value of Students' 't'. It is seen that mean difference is not statistically significant in respect of any of the comparisons leading to the inference that differences in yield rates between whole field and rectangular cuts, whole field and circular cuts and rectangular and circular cuts can be attributed to the sampling fluctuations.

Table: 0.3

Average yield of paddy as obtained from whole field, rectangular cut, circular cut with sampling errors of differences in yield rates and values of Students' 't'.

Sub-sample	No. of fields	Average yield (simple) in kilograms/acre			Mean difference ± S.E.			Students' 't'		
		Whole field	Rectangular	Circular	Whole field Rectangular	Whole field Circular	Rectangular Circular	W.F Rectangular	W.F Circular	Rectangular Circular
1	2	3	4	5	6	7	8	9	10	11
<u>Central</u>										
1.	30	960.06	952.17	1017.73	+7.89±31.65	-57.67±51.88	-35.55±74.24	0.25	1.11	0.88
2.	26	357.32	838.64	930.02	-0.83±45.50	-63.10±60.09	-62.38±33.90	0.02	1.05	1.84
Total	56	917.23	913.39	977.42	+3.84±26.85	-60.19±39.01	-64.03±42.41	0.14	1.54	1.51
<u>State</u>										
1.	26	920.69	923.46	942.28	-1.77±18.11	-21.59±31.00	-19.82±29.34	0.10	0.70	0.68
2.	30	826.10	735.97	834.97	+10.13±39.91	-8.88±50.83	-49.00±47.55	1.01	0.17	1.03
Total	56	870.01	849.34	884.79	+20.67±22.96	14.73±30.55	-35.45±28.69	0.90	0.48	1.24
Combined	112	893.62	881.37	931.11	+12.26±17.61	-37.49±24.76	-49.74±25.54	0.70	1.52	1.95

5.4 Paired comparisons between the yield rates based on rectangular and circular cuts are also possible in respect of group 2 villages as also for all villages put together. The results of this study are summarised in the following table:

Table 0.4: Average yield rate of paddy as obtained from rectangular and circular cut with values of Students' 't'

(ALL SAMPLE)

Sub-sample	No. of fields	Average yield (simple) in kgs/acre		Mean difference and S.E.		Students' 't'
		Rectangular	Circular	M.D.	S.E.	
1	2	3	4	5	6	7
<u>Central</u>						
1.	48	822.30	909.85	-86.55	48.91	1.77
2.	46	592.57	931.03	-38.46	30.43	1.26
Total	94	656.69	919.71	-63.02	29.03	2.17
<u>State</u>						
1.	46	841.89	854.58	-12.69	23.54	0.54
2.	53	782.22	777.98	4.31	37.71	0.11
Total	99	809.98	813.57	-3.59	22.37	0.16
Combined	193	832.73	865.26	-32.53	18.47	1.76

PAIRED SAMPLE (Where whole field harvest was not done).

<u>Central</u>						
1.	18	605.84	727.39	-121.55	42.97	2.83
2.	20	923.67	931.18	-7.50	54.69	0.14
Total	38	773.12	834.65	-61.53	36.03	1.71
<u>State</u>						
1.	20	737.16	740.57	-3.42	39.37	0.09
2.	23	777.49	703.63	73.85	58.90	1.25
Total	43	758.73	720.81	37.91	36.51	1.04
Combined	81	765.48	774.22	-8.74	26.16	0.33

5.5 Although an appreciable difference is noticed in the yield rates between circular and rectangular cuts in the case of Central sample (f) both for the sample of fields where whole field harvest was not organised and for all fields considered together, the differences are not statistically significant based as they are on a small number of observations. At the pooled level the results go to confirm the statement made earlier that there are no differences between yield rates obtained on the basis of rectangular and circular cuts. Differences noticed can be

attributed to sampling fluctuations.

5.6 The magnitude of the differences at individual field level between various types of cuts has also been studied. A frequency distribution of the number of fields, according to the magnitude of differences between two types of cuts both positive and negative, has been prepared. For facility of easy comprehension, a summary of the positive and negative differences between types of cuts is presented below:-

Table 0.5: Count of differences of yield rates Whole Field - Rectangular and whole field - Circular

Sub-sample	Count of positive and Negative differences					
	Whole field-Rectangular cut			Whole field-Circular cut		
	Positive	Negative	Total	Positive	Negative	Total
1	2	3	4	5	6	7
Central 1.	16	14	30	14	16	30
2.	10	16	26	8	18	26
Total	26	30	56	22	34	56
State* 1.	12	14	26	11	14	25
2.	16	14	30	11	19	30
Total	28	28	56	22	33	55
Combined	54	58	112	44	67	111

* In one case whole field - circular cut in State sample is zero.

Table 0.6: Count of positive and negative differences in yield rates.

Sub-sample	Count of +ve and -ve differences (Rectangular-Circular)											
	Whole field sample				Remaining sample				All			
	0	+ve	-ve	Total	0	+ve	-ve	Total	0	+ve	-ve	Total
1	2	3	4	5	6	7	8	9	10	11	12	13
Central 1.	-	14	16	30	-	4	14	18	-	18	30	48
2.	-	10	16	26	-	8	12	20	-	18	28	46
Total	-	24	32	56	-	12	26	38	-	36	58	94
State 1.	-	13	13	26	-	11	9	20	-	24	22	46
2.	-	10	20	30	-	15	8	23	-	25	28	53
Total	-	23	33	56	-	26	17	43	-	49	50	99
Combined	-	47	65	112	-	38	43	81	-	85	108	193

5.7 It is seen that the number of positive differences is about equal to the number of negative differences in the case of whole field and rectangular cut comparisons while the number of negative differences

is predominantly greater than the number of positive differences for comparisons for whole field and circular cuts. It is seen that this is so not only at the pooled level but consistently so for all sub-samples. In the case of differences between rectangular and circular cuts it is interesting to note that the number of negative differences is predominantly higher than the number of positive differences in respect of group 1 villages, whereas it is about same in the case of group 2 villages. Pooled over group 1 and group 2 villages, the number of negative differences is seen to be higher than no. of +ve differences for both the sub samples of the Central sample, whereas it is about the same order in the case of the sub-samples of the State sample.

6. Conclusion

6.1 The results of the study show that there is no significant difference in the yield rates obtained from the whole field harvest; rectangular cuts and circular cuts. The normal field conditions which ought to have obtained for the study did not however prevail in view of the organisation of whole field harvest in 50 per cent of the sample which necessitated the presence of the Supervisory Officers for ensuring accuracy of all operations. It will, therefore, be interesting to see how far and to what extent pre-conditioning of investigating staff and the intensive inspection of field work has affected the quality of field work as judged by the yield rates, by obtaining yield rates of paddy based on crop cutting experiments carried out in villages other than those selected for this study in both Central and State NSS, as also gross yield rates based on rectangular cuts of the State official series for forecasting yield rates.

7. Summary

- 7.1 .
- i) A type 2 study was organised in Andhra Pradesh on paddy in NSS villages selected for crop cutting experiments (both Central and State):
 - ii) Both rectangular and circular cuts were taken in two fields each in 112 villages and whole field harvest in 56 of these villages;
 - iii) The results show that the average yield rate of paddy (rice in husk) is the lowest for rectangular cut. The yield rate obtained from whole field harvest and circular cuts although higher than the yield rate for the rectangular cuts are not statistically (significantly) different.
 - iv) Normal field conditions which ought to have prevailed in type 2 study did not obtain in Andhra Pradesh in respect of supervision of field work due to the organisation of whole field harvest in 50 per cent of the cases.