

Section I. Introduction

I have given a general account of the work relating to the crop survey during the jute and aus paddy season in a separate Report, in which I have described the progress of the survey during the earlier part of the year. It would be remembered that I had originally submitted a joint scheme for the survey of crops in both the aus and aman paddy seasons but sanction was given by the Government of Bengal in the first instance to proceed with the work on only the jute and aus crops. We therefore started preparatory work in February 1944 on the basis of only the jute and the aus crops. After further discussions with Mr. J.N. Talukdar (who was acting as Secretary, Agricultural Department in April 1944) and subsequently with Mr. Hill who succeeded him we also started in May 1944 preparatory work for a survey of the aman crop but this had to be discontinued towards the end of June under instructions from Mr. Hill as the Agricultural Department did not consider it desirable to proceed with the scheme. This sudden change in the plan naturally dislocated the whole of the preparatory work.

2. At that time we were passing through an unprecedented food crisis in the province. In view of the importance of ascertaining the correct position in regard to the supply of rice I approached the Hon'ble Mr. H. S. Suhrawardy, Minister in charge of Civil Supplies and placed my views before him. I was informed unofficially in July and formally in August that Mr. Suhrawardy had decided to take up the survey of the aman crop from the Department of Civil Supplies. This gave us the opportunity for the first time of making a comprehensive survey of the paddy crop in Bengal. Unfortunately by this time the season was well advanced and the field operation of the area survey in the jute-aus season had already terminated over the greater part of the province. A good portion of the field staff had in consequence been disbanded. Immediate steps were however taken to re-organise the programme of work etc. were taken in hand. There was not time, however to get ready a fresh design for the survey of the aman crop and we decided to adopt the design which we had already used during the Jute-Aus season. Certain extensions were however made to cover areas in which the Jute and Aus crops were not important but in which aman paddy was largely sown.

Section 2. Field Organization,

3. The general structure of the organization was similar to that used in the survey in the jute-rice season but important changes were made for improving the efficiency of the primary work. The whole province was divided into 22 blocks as in the jute-rice season. The total time available for the field survey being much smaller we however used 50 field units (each consisting of four or five investigators, and one special investigator in charge of one inspector) in the place of 42 units employed in the jute-rice season. The posts of Check Inspectors were abolished and were replaced by 44 posts of Chief Inspectors; posts of camp investigators were also abolished. One Chief Inspector was placed in charge in each of the 22 blocks and had two or three field units under him. At a convenient place within each Block a camp office was opened where the inspectors could keep the maps and records in charge of a camp clerk.

4. The field staff was organized into two broad parties (A) and (B), and arrangements were made to do the area enumeration work independently by each of these two parties. Each block was divided into a number of sub-blocks the total number of such sub-blocks being 344. Only one set of maps being available for field work, the programme was arranged in such a way that the two parties (A) and (B) could be supplied with maps required for their work at the proper time.

5. The field staff consisted of one Supervisor, two Assistant Supervisors, 21 Chief Inspectors, (Inspector being in charge of one Block, the only exception being the Calcutta block which was kept under the direct control of the Head Office), 50 Inspectors, 272 Investigators, and 25 camp clerks. The exact actual number of men employed was of course much greater as shown in the following Table (1) in which col. (1) gives the designation of the worker; col. (2) the cadre or nominal strength; col. (3) the actual number of persons employed at one time or other. The number of persons who resigned, were discharged, or were given casual appointments are shown in cols. (4), (5) and (6) respectively. The total number of days of leave is given in col. (9); and with and without pay are shown in cols. (7) and (8) respectively.

Table (1) : Field Staff in Survey of Aman Paddy 194-44.

Designation	CASRE	Number of Persons				Number of days of leave,		Total
		actually appointed	Resigned	Discharged	Casual appointment	With Pay	Without Pay	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Chief Inspectors	22	22	-	1	1	64	17	81
Inspectors	50	61	6	2	11	48	99	147
Investigators	272	368	29	41	116	218	369	587
Temp Clerks	25	50	1	2	5	34	37	91
Total	368	501	36	46	133	364	462	826

6. It will be noticed that no less than 501 persons were employed in the course of about three or four months to fill 368 posts, also that nearly 50 man-months were lost on account of leave.

Progress of Area Survey

7. The area survey of aman paddy began in different Blocks on different dates between 15th and 15th September. Work in Block No.19 was completed on the 22nd November while the survey in Block Nos.5 and 20 continued till 20th December. The distribution of the area survey work is shown by Blocks Table (2) in which col.(1) gives the serial number of the blocks; col.(2) gives the names of districts; col.(3) the actual duration of survey; col.(4) the number of field camps (i.e. places where the field staff stayed at night); col.(5) the number of field units; col.(6) the number of investigators; and col.(7) the number of pay-days of investigators. The total number of grids (each of size 2.25 acre) originally allotted to each Block is shown in col.(8) and the number actually enumerated in col.(9); out of these the number checked by Inspectors is shown in col.(10). It will be noticed that the number of grids originally allotted was 70,773; this was intentionally made high so as to enable the quicker workers to give some scope for doing a larger volume of work. The total number actually enumerated was 62,431 out of which 6240 or almost exactly 10 per cent were checked by the inspectors; besides this number of special check parties went round and checked 376 grids.

Table (2) : Distribution of area Survey work by Blocks in Aman Season 1943-44.

Name of Districts	Period of Survey.	Number of camps.	Number of Units.	Invoice-tiga-tion.	Pay days.	Number of grids. Allot-ed.	Examina-tion.	Checked by Inspect ion.
(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Barisal- Faridpur	21/9- 0/12	37	3	22	1221	5659	3210	286
Faridpur, Dacca, Nadia	13/9- 9/12	26	2	14	1036	4250	3980	315
Dacca	22/9- 4/12	18	2	19	622	3012	2128	250
Chittagong, Tippera, Noakhali	22/9-15/12	36	3	23	1598	4710	4137	559
Myensingh	19/9-20/12	21	2	14	879	3255	2544	221
Myensingh, Dacca	19/9- 9/12	19	2	15	829	3515	3272	222
Pabna, Rajshahi	15/9- 1/12	19	2	14	807	3042	2624	322
Myensingh, Dacca	22/9-12/12	21	2	17	875	3609	3187	172
Rajshahi, Dinajpur, Rangpur, Bogra	15/9- 9/12	35	3	23	1326	4353	3486	411
Rangpur, Jalpaiguri	20/9- 7/12	27	3	28	1175	4438	4244	458
Jalpaiguri, Rangpur	20/9-13/12	19	2	16	869	2684	2070	197
Dinajpur	22/9- 7/12	24	2	16	690	2634	2244	192
Rajshahi, Dinajpur, Malda	21/9- 3/12	27	2	16	647	2886	2658	210
Murshidabad, Nadia, Rajshahi	21/9- 9/12	36	2	16	749	2436	2232	232
Nadia, Jessore	18/9- 6/12	27	2	18	960	2883	2756	233
Khulna, Jessore	17/9- 9/12	28	2	12	1014	3518	3101	301
Jessore, 4 Parganas, Khulna	19/9- 3/12	35	3	25	930	3642	3124	328
2 Parganas, Howrah, Hooghly	18/9-17/12	27	2	18	844	2367	2019	272
Burdwan, Hooghly	19/9-22/11	20	2	20	701	2097	1772	165
Burdwan, Birbhum	25/9-20/12	24	2	17	800	2513	2252	260
Medinipur, Hooghly, Bankura	20/9-26/11	24	2	15	807	2244	2272	280
Medinipur	21/9-15/12	7	2	21	1030	3552	3159	238
Total	15/9-20/12	574	50	401	20455	70773	62431	6240

8. In 1943 the field survey had to be carried out in the midst of an unprecedented food crisis in the province. The workers had sometimes to pay at the rate of Rs. 40/- or 50/- per maund of rice even at this price supply was often not available and some of the workers had to go without a solid meal a day from time to time. We approached the Government of Bengal for obtaining rice at controlled rates for our workers but there was great delay and in issuing necessary order

9. Many of the workers left us on account of illness or on security employment on better terms elsewhere. A number had to be discharged for unsatisfactory work. The number of casualties due to resignation or discharge are shown in cols.(4) and (5) of Table (1) respectively the total number of casual appointments for short periods are also shown by categories in col.(6).

10. One great difficulty was the high rate of incidence of Malaria. This was aggravated by the fact that in spite of repeated efforts we were unable to obtain a supply of quinine from Government for our workers. We were told that the field workers should apply to district authorities for quinine. It is scarcely necessary to point out that this procedure was altogether impracticable. The investigators are supposed to move about from one village to another and may become ill at any odd place and it is altogether impossible for them to obtain a supply of quinine from district authorities at the actual time of illness. As we were unable to supply quinine we had no other alternative but to give the worker leave during the period of illness. Details are given in cols. (7), (8) and (9) of Table (1). It will be noticed in this way we lost 826 working days altogether, that is, something of the order of 30 man-months. It is obvious that a far more economical policy would be to supply quinine and other medicines at our expense. I hope better arrangements in this regard would be made in future.

Crop cutting work

11. For crop cutting work a different organization of field units was used. The Chief Inspector with the camp clerk and two special investigators form a one unit, and each such unit worked in 4 localities within each Block. Each unit halted in one locality for one week and cut the crop on plots which were selected at random in the Statistical Laboratory in accordance with a definite plan. At the time of crop cutting work the field staff also made some area enumeration for the year from which the plots for crop cutting had been selected. Besides the special crop cutting units in charge of Chief Inspectors described above, Inspectors also did some crop cutting work as soon as the area survey was finished. Each Inspector selected three of the Investigators under his unit and proceeded with the crop cutting work on broadly the same plan as the Chief Inspector's units, but the Inspector's unit usually worked in only one centre.

12. The distribution of crop cutting work by Blocks is shown in Table (2) in which the first two cols. give the serial number of the blocks

blocks and names of the districts; col.(3) the period of crop cutting work; col.(4) the number of camps or localities visited in each party Block; col.(5) the number of plots in which crop cutting work was done, and col.(6) the number of pay-days of investigators used for this purpose. Two different sizes of cuts were used, namely, 6' x 6' and 12' x 12' and the number of cuts of each size secured in each block is shown in cols.(7) and (8) respectively. It will be noticed that there were altogether 8,480 cuts of size ~~6' x 6'~~ 6' x 6' and 3072 cuts of size 12' x 12'.

Eye estimation Test

16. As in the Jute-saus season arrangements were made to hold examinations in 12 different centres in December 1943 to test the proficiency of workers in making eye estimates of the yield per acre of paddy. It is gratifying to report that no less than 146 candidates appeared at the examinations on payment of one rupee each as entry fee among whom 25 were awarded prizes ranging from 5/- to 100/-.-The results of the test are discussed in a later section, but it may be mentioned here that the experiment was successful in every way. A number of candidates were found to possess exceptional ability in making reliable eye estimation of the yield per acre. Secondly, the competition aroused a good deal of interest and must have indirectly improved the quality of crop cutting work by inducing the field staff to give themselves good training in eye estimation work by weighing the harvested crop with accuracy in the course of their ordinary field work.

Section 5. Statistical work

Design of the survey

As already mentioned sanction for the main survey was given very late when no time was left for thorough revision of the programme. The design used in the case of the survey of main paddy was similar to that during the jute-rice season. Certain modifications were however introduced at the last moment. As already mentioned, 15 additional sub-blocks were included in the survey to cover regions in which jute and rice crops were not important but in which main paddy was grown in appreciable quantities.

15. The work in 1942 had been carried on under great difficulties and it had been found that the quality of the field work had deteriorated somewhat. We thought it desirable therefore to strengthen the statistical controls. The principle of sub-sampling, that is, securing the field data in the form of two independent inter-penetrating half-samples (by two different parties (A) and (B) of the field organization) was retained, but arrangements were made to have some of the grids actually ~~enumerated~~ enumerated in duplicate by both the field parties. This made it impossible to adhere to the uni-stage technique, and we decided to use a three-stage sampling. In the first stage, 30 per cent of the police stations or sub-blocks within each block were selected at random; within each selected sub-block a certain number of sheets of C.S. village maps were then selected at random; and finally, in each such selected sheet a number of grids of size 2.25 acres were located at random. Arrangements were made to have the work done by both parties in 67 per cent of the sub-blocks against 66 per cent in the jute-rice season; in the same way the number of sheets on which work was done by both parties was increased from 30 to 37 per cent; and finally, the proportion of grids enumerated in duplicate was increased from 16 to 37 per cent.

16. It would be seen therefore that there was a very appreciable strengthening of the statistical controls. The duplication of sample units does not however, supply any additional information; and the fact that 37 per cent of the grids (in 37 per cent of selected sheets) had to be enumerated in duplicate meant at least 17 per cent of additional field work and 30 per cent of additional computational work up to the stage of inspection. All this was of course unproductive, but this was the price we had to pay to guard against undue unreliability of the primary work. We thought it desirable to be on the safe side in view of the great importance of the question in a year of acute food crisis.

17. For convenience of reference we shall call any sub-block or sheet in which enumeration work is done in duplicate by both the parties (A) and (B) or any grid which is enumerated in duplicate as "duplicated" sub-block sheet or grid respectively; other sub-blocks sheets or grids would be called "single". The distribution of sub-blocks, sheets and grids of both "duplicated" and "single" types is shown by districts in Table (4) in which cols.(1) gives the name of the district; cols.(2),(3) and (4) the number of duplicated, single and the total number of sub-blocks respectively. In the same way cols.(5),(6) and (7) give the number of duplicated and single and the total number of sheets respectively included in the survey; and cols. (8), (9) and (10) give the duplicated, single and total number of grids respectively. Finally, including the duplicated grids col.(11) shows the total number of grid enumerations; thus the total number of grids enumerated being 45,536 out of which 16,895 were having been duplicated there were 62,431 enumerations of grids altogether.

18. As the chief purpose of duplicating the work was to test the reliability of the primary enumeration, care was taken to camouflage the duplication by partial overlapping of the duplicated units within duplicated or single ones. This was maintained at all three stages so that the field staff had no knowledge as to which sub-blocks, or which sheets, or which grids were going to be duplicated. This made it very difficult if not impossible for duplicate records being prepared by copying.

Preparatory Work

19. As soon as unofficial information was received at the end of July 1941 that Government had decided to proceed with the survey of main party, arrangements were made to resume the preparatory work which had been suspended in the third week of June. The break had however seriously dislocated arrangements in the Laboratory, and it was some time before the work could be brought up to full strength. However, by placing every available man on the job the preparatory work was finished in time to enable the field survey being started on the 16th September. This was possible only because of the ungrudging work on the part of the old guards of the statistical Laboratory.

20. Two sets of khasra or crop record forms (showing the revenue plot number and the area in acre of each plot falling within the grid) were prepared and supplied to the field staff for ~~being~~^{being} filled in with the annual estimate of the area under different crops. This involved listing the plot number and area of about 13 lakhs of plots. Additional copies were also required for the field as well as for computational work in the Statistical Laboratory. We therefore used two pieces of carbon papers for securing the necessary number of carbon copies; and in this way 18,000 sheets of carbon papers had to be consumed for this work alone.

21. In order to prevent any breakdown due to the loss of field records in transit under our conditions, arrangements were made for one set of field records to be sent to Calcutta and the other to the Giridih Branch of the Laboratory directly from the field. Advantage was taken of this arrangement to proceed with primary tabulation independently in Calcutta and at Giridih. This gave us a 100 per cent control at the stage of compilation as it was a simple matter to compare certain field figures as reported by the two branches of the Laboratory in Calcutta and at Giridih.

22. Progressive Tabulation: Arrangements ~~were~~ were made for proceeding with the tabulation work in the form of accumulated totals so that progressive estimates of the area under aman paddy were prepared at the end of every week. The ~~per~~ proportion of land under crop obtained from individual grids were then plotted in a two-way chart in which the x-axis showed the dates and the y-axis the intervals of crop-proportion in fine classes. The forecast of the crop under aman paddy each week was obtained by direct summation of the results over seven days, and was also checked by obtaining the frequency distribution over the whole week and then calculating the mean value.

Section 4. Area under Aman Paddy

23. In this Section we shall discuss the material relating to the area survey of Aman paddy in 1943-44.

Sub-sample Estimates

24. As already mentioned in the earlier section the sample survey covered 341 sub-blocks out of which 250 were surveyed in duplicate by (A) and (B) parties. In the duplicated sub-samples not all but only a certain number of C.S. village sheets were common to both the parties and within each duplicated sheet only two grids out of a total of four were enumerated by both the parties. The two estimates for the area under aman paddy based on the work done by the two parties (A) and (B) on the same set of "duplicated" sub-blocks selected at random were thus associated. The agreement between these two estimates would therefore supply a good idea of the reliability of the primary field work. In the non-duplicated or single sub-blocks the work was done by one party, and the estimate based on such single sub-blocks furnished a third value which we have called the 'C' sub-samples. This third estimate was of course independent of the pair of associated sub-samples 'A' and 'B'.

25. All three estimates 'A' 'B' and 'C' are given by districts in Table (5) in which col.(1). gives the name of the district, col.(2) the total geographical area in thousand acres; col.(3) the number of duplicated sub-blocks and, col.(4) gives the number of sheets of C.S. village maps in which work was done by both the parties; col.(5) the number of duplicated grids which were enumerated by both parties (A) and (B). The estimated area under aman paddy in thousand acres together with the standard error of the estimate based on the work done by party (A) is shown in col.(6); and the percentage variability (measuring thereby the standard error of the estimate expressed as a percentage of the estimate itself) is shown in col.(7). The corresponding estimated area together with its standard error based on the work of party (B) is given in col.(8) with the percentage variability in col.(9). The number of single (or non-duplicated) sub-block sheets and grids are shown in cols.(10), (11) and (12) respectively. The third or (C) sub-sample estimate of the area together with the standard error is given in col.(13); and the corresponding percentage variability in col.(14). This combined area estimate

estimate is shown in Table (6) in which the figures in cols.(1) - (7) are arranged in exactly the same way as in Table (5).

28. For a statistical comparison of the three different estimates (A) (B) and (C) we have used Fisher's t-statistics which is simply the difference of the two estimates under comparison divided by the standard error of the difference. (Large sample theory can be used in this comparison because the number of grids employed was large in every case). The values of Fisher's 't' for the 3 different comparison (A-B), (A-C) and (B-C) are shown in Table (6) in cols.(8),(9) and (10) respectively. It will be noticed that with a few exceptions the values of 't' are less than two. The agreement between the 3 sub-samples (A),(b) and (C) were thus fairly satisfactory although conditions were not completely under control. The agreement was not too close and thus does not suggest any appreciable use of the same set of records having been copied by the both parties.

27. It will be noticed from the figures given in the bottom line of Table (5) that the (A),(B) and (C) estimates for the province as a whole were 2 8,240 and 247 lakhs of acres, the pooled value being 244 lakhs of acres of land sown with Aman paddy.

29. The standard error of the estimates was calculated in each case on the basis of multi-stage formulae. The relevant material for this purpose is shown in Tables (7), (8) and (9) respectively. In each of these tables col.(1) gives the name of the district; col.(2) the degrees of freedom and col.(3) the variance between grids within sub-blocks; in the same way col.(4) shows the degrees of freedom and col.(5) the ratio of the variance between sub-blocks to variance within sub-blocks next ~~micro-subplots~~. Finally, the estimates of the variance of the stage means between sub-blocks and between grids within sub-blocks are given in the last two cols.(6) and (7) respectively. These are purely technical constants which are being given here for convenience of future reference but need not be further discussed here.

29. One or two comments may, however, be made on the percentage variability of the estimated area under Aman paddy shown in cols.(7),(8) and (14) of Table (5) and in col.(7) of Table (6). These supply a standard measure of the percentage margin of error of the results. For the province as a whole these are usually of the order of 2 or 3 per cent

indicating that the estimates are not likely to be out by more than 5 or 6 per cent once in 20 trials. Values for individual districts are naturally much larger and fluctuate widely from district to district.

30. It would be remembered that the primary field records are given in the form of area estimates of the proportion of land under aman paddy in each plot falling within the grid. Multiplying these area estimates by the corresponding area of the plot we get the actual area of land under aman paddy in each plot; and adding up these areas we get the total area (or proportion) of land under aman paddy in each individual grid. In any region, say, within a given block or district we can form a frequency distribution of the proportion of land under individual grid, and it is clear that such a frequency distribution will be characteristic of the district under consideration. In the sample survey we have material for calculating the proportion of land under aman paddy within individual grids enumerated. For this we can form the frequency distribution of grid-proportions within different blocks. The frequency distribution of grid-proportions for each block is shown in Table (10).

31. One point is worth noting in Table(10). The most frequent value almost invariably occurs at the $p = 1$ or full proportion which shows that aman paddy is most often sown over the whole of the plot. The next largest frequency occurs at the zero value, which shows that in the case of aman paddy the tendency is rather ~~xxx~~ to leave the plot out altogether. Between these two limits, the frequency distribution is more or less uniform.

Progressive Estimates of the Area Under Aus and Aman Paddy

32. It has been already mentioned that tabulation was done in the form of accumulated totals which made it possible to prepare progressive estimates are given in Table (11) in which col.(1) gives the chronological or serial number of the week beginning from the last week of May; col.(2) the actual period of field work in calendar dates; col.(3) the number of sub-blocks included in the tabulation. The proportion of land under aus paddy is given in col.(4), and the corresponding proportion under aman paddy in col.(5) while the proportion of land under both aus and aman paddy is shown in col.(6).

33. aus Paddy: It will be noticed that the proportion of land under aus paddy is high at the end of May, but falls to something like a steady value between 9th June and 8th July and then decreases somewhat but is still quite high at the end of August. In September the proportion rapidly decreases and becomes practically nil by the time winter survey starts. The high intensity of cultivation in the earlier part of the survey may have been partly due to the fact that the field work was done in the comparatively rich aus districts during the earlier weeks. It is possible that broad-leaved aus (which is sown earlier in the season) is more easily distinguished from aus paddy than transplanted aus. If this is true then there would be less chance of transfer from aus to aus paddy in earlier weeks, but such transfers would increase as the season advances and more and more transplanted aus begins to come under survey.

34. Aus Paddy: Estimate of the proportion of land under aus paddy is available from very beginning of the summer survey in May till the middle of November. It decreased from 31 per cent at the end of May to 19 per cent in the third week of June after which it steadily increased to the maximum value of 71 per cent in third week of September after which it gradually decreased and was more or less steady at about 55 or 54 per cent in October or November.

35. The progressive estimates are shown separately for the different districts in Tables (12), (13) and (14) which give an interesting picture of the position in different regions and show the time at which the area was most fully sown with aus paddy in different part of the province.

Area Survey at the time of Harvesting

36. Arrangements were made for the crop-cutting units to make an area survey at the time of doing their crop-cutting work. These units worked in 120 centres distributed at random all over the province. Within each centre a number of sheets were selected at random out of the 120 sheets which had been used during the main area survey, and the grids already used for the area survey were again used for crop-cutting work. Each worker was instructed to enter the area estimate of the plots falling within the grids allotted to him even if the crops were not available for being harvested in any of the plots.

57. In this way a supplementary area survey was made during the actual harvesting period by a selected group of workers. The estimates are shown in Table (15) in which col.(1) gives the name of the district; col.(2) the geographical area of the district in thousand acres; col.(3) the number of sub-blocks; col.(4) the number of sheets, and col.(5) the number of grids covered during the main area survey and col.(6) the area under sown in thousand acres together with the corresponding standard error based on the pre-harvest survey. In the same way col.(7) gives the number of sub-blocks; col.(8) ~~number of sheets~~ the number of sheets, and col.(9) the number of grids covered during the area survey carried out at the time of harvesting, and col.(10) the estimated area together with the standard error based on this survey. In the two districts of Hooghly and Howrah the crop-cutting work was done along with the intensive programme of similar work in connexion with the Burdwan-Hooghly-Howrah Flushing and Irrigation Scheme, and no area survey was done at the time of harvesting. The values shown within brackets are therefore calculated values obtained from the ratio of the provincial totals for cols.(6) and (10) of Table (15).

58. It will be noticed that the area under sown paddy at the time of harvest was 212.55 ± 6.75 lakhs of acres against a pre-harvest estimate of 234.46 ± 3.75 lakhs of acres. The acreage at the time of harvest was thus appreciably lower. Owing to the failure of the rains or insect blights or destruction by animals or other causes the harvested area must be less than the sown area. The observed difference is therefore in the right direction; but as the estimate of the area at harvesting time is based only on about 4,000 grids in 119 sub-blocks it is not possible to draw any definite conclusions.

Section 5. Crop Cutting work on Aman Paddy : 1943-44

39. As already mentioned, crop-cutting work on aman paddy started on the 19th November and was continued till early January 1944 in some of the districts. The work was done by 22 units each consisting of two or three investigators under one Chief Inspector who secured sample cuts in 120 centres distributed at random all over the province. In each locality 15 sample units were located on sheets at densities of one in one, one in two and one in three in a balanced design. Each selected sample sheet was divided into four quadrants, and in each quadrant two grids were located at random and the worker was asked to collect two cuts, one of size 6' x 6' and the other of 12' x 12', in each of two plots contained within the grid.

40. As already mentioned, each worker also recorded the area estimate of the proportion of the land under aman paddy in each grid allotted to him even if crops on all the plots were not available for being harvested. This served a dual purpose. Firstly, it supplied an independent estimate of the area under aman paddy at harvest time. Secondly, this enables the rate of total production per sample sheet being directly calculated by multiplying the rate of yield (y) by the intensity or proportion of land under cultivation (p). Taking the average of these supply these products (which we may write as yp) supply directly an estimate of the rate of production per unit of geographical area, while the average of different values of y (which we may write as \bar{y}) gives the rate of yield per unit of cropped area. An alternative method for estimating the total production is by multiplying this average rate of yield (\bar{y}) by the average intensity or proportion of land under cultivation (\bar{p}). This method ignores the mutual correlation which might exist between the intensity of cultivation (p) and the rate of yield (y). The method of calculating the total production by taking the average value of the joint product (yp) is therefore definitely an improvement in the method of estimation.

41. Before considering the total production of rice it is necessary to mention certain disconcerting features in the crop-cutting work. As, already mentioned, cuts of two different sizes namely, 12' x 12' and 6' x 6' were obtained from each plot. Relevant data are given in Table (16) in which col. (1) gives the serial number of the field unit;

col (2) the number of villages covered by each field unit during crop-cutting work; cols. (3) and (4) the mean yield in tolas per sq. feet of freshly harvested paddy based on cuts of size 12' x 12' as collected in samples (A) and (B) respectively. In the same way cols.(5) and (6) show the mean yield in tolas per sq. feet based on cuts of size 6' x 6' in samples (A) and (B) respectively. It will be noticed that the mean yield based on cuts of size 6' x 6' for the province as a whole was 21.89 and 21.56 respectively for (A) and (B) samples. Against these figures we have mean yields of 16.86 and 16.09 based on corresponding cuts of size 12' x 12'

42. In the same Table (16), col. (7) shows the number of cases in which the yield based on 12' x 12' cuts was in excess (by more than +5 tolas) of the corresponding yield based on cut of size 6' x 6' located in the same plot; col. (8) shows the number of cases in which the difference was between + 5 and -5 tolas; and finally, col. (9) the number of plots in which the yield based on 6' x 6' cut was higher than the corresponding yield based on the 12' x 12' cut by more than 5 tolas.

43. It would be remembered that cuts of both the sizes 6' x 6' were obtained from each of the plots. Mean yields based on the two sizes of cuts would not, of course, be identical but would differ by chance fluctuations. It is obvious however that, unless there is any bias, the number of occasions on which the rate of yield would be higher for the smaller cuts of size 6' x 6' would be roughly the same as the number of occasions when the yield would be lower for the smaller cuts. A glance at cols.(7), (8) and (9) of Table (16) shows that this is far from true. In fact we find that in 622 plots the rate of yield was greater for cuts of smaller size as against 235 cases in the rate of yield was greater for cuts of larger size. This shows that there was a tendency to overestimate the rate of yield in the case of cuts of the smaller size. This may be due to some of the bordering plants having been drawn within the cuts. Such a border bias, if any, would naturally be of greater importance in the case of cuts of smaller size. The observed bias may also be due to the an unconscious tendency selecting high yielding patches which possibly could be seen easily in the case of the smaller size of cuts.

44. It will be noticed that the material falls into broadly two groups. In the case of certain field units such as Nos. (1), (4), (8), (7), (9), (17), (20), and (22) there is on the whole no marked bias; but in the case of the remaining field units the number of negative differences are much larger. It is also remarkable that it is just these field units which show a strong bias that the agreement between the two sub-samples (A) and (B) is usually closer. This also is suspicious.

45. It is of course not possible to state definitely just what had happened. In our previous studies on the jute crop and also to a smaller extent on the paddy crop we had found that there was a definite tendency to overestimate the rate of yield when the size of the cut was very small. We found however that in the case of jute, cuts of size bigger than, about 4' x 4' were practically free of bias. However, in view of the possibility of the yield based on the smaller size cuts having been overestimated we have rejected the records for the 4' 6" cuts and made all subsequent calculations on the basis of the records for 12' 12" cuts.

Yield of Aman Rice

46. The yield of rice (not in husk) in maunds per acre of cropped area based on sample-cuts of size 12' x 12' is shown for each district in Table (17) in which cols. (1) and (2) give as usual the name and geographical area in thousand acres of the districts; cols. (3) — (5) show the coverage of the crop-cutting work in different districts in terms of number of sub-blocks, sheets, mauzas and cuts of size 12' x 12'. The calculated rate of yield of Aman rice (not in husk) in maunds per cropped acre is shown in col. (6). (The figures for the two districts Hooghly and Howrah have been obtained from the crop-cutting work in the Burdwan-Hooghly-Howrah Flushing and Irrigation Scheme). Multiplying these rates of yield by the estimated area during the pre-harvest survey shown in col. (6) of Table (15) or by the estimated area at the time of harvesting shown in col. (10) of Table (15) we get two alternative estimates of the total yield of rice (not in husk) in thousands of maunds given respectively in cols. (7) and (8) of Table (17). On the whole it appears safer to adopt the estimated figure of 25.59 crores of maunds for the province as a whole as shown at the bottom of col. (8)

Alternative Methods of Calculating total Production

47. It is also possible to calculate the total production by using the rate of yield (y) and the proportion of land under aman paddy in each sheet (q). By multiplying these two we get the rate of total production per sheet or per acre of geographical area. Estimates based on this method have the great advantage of enabling the standard errors being calculated by straightforward methods. Relevant figures are given in Table (18) in which col. (1) and (2) give the name and total geographical area of the district in thousand acres; col.(3) the estimated area under aman paddy in thousand acres together with the corresponding standard error, and col.(4) the percentage variability (which is simply the standard error of the estimate area expressed as a percentage of the estimated area itself). In the same way, the rate of yield of rice (not in husk) in maunds per acre together with the standard error is shown in col(5) and the percentage variability in col.(6). Finally the total production of rice obtained by first calculating the average value of the joint product (yp) and then multiplying this by the total area of the district is shown in col.(7) together with the standard error, and the percentage variability of the estimated total production in col.(8). It would be noticed that by this method the total production comes out as 26.64 \pm 0.93 crores of maunds.

48. The standard errors have been calculated by appropriate multi-stage formulae. It would be noticed that for the province as a whole the estimated area has a standard error of 3.56 per cent; the mean rate of yield a standard error of 2.4 per cent, and finally the estimated total production has a standard error of 3.74 per cent. The margin of error for individual districts is naturally much higher.

49. We find that on the basis of the available material the estimated total production of Aman rice (not in husk) in Bengal in 1943-44 comes out as 25.39, 26.45 or 26.64 crores of maunds depending on the method of calculation. We also find that calculated standard error is 3.74 per cent, or say of the order of four per cent. We may, therefore, reasonably conclude that the total production of Aman rice probably lies somewhere between say 25.4 and 26.6 crores of maunds.

Section 6. General Discussion of the Results

50. It may be mentioned here that the sample estimate of the pre-harvest or seeded area is 244 lakhs or nearly 36 per cent higher than the official figures of about 180 lakhs of acre. The sample estimate of the harvested area is 212.55 lakhs of acre which also is about 18 per cent in excess of the official estimate. As this is the first year of the sample survey, no direct evidence is available to enable us to settle the matter either way or that. We, however, possess some indirect evidence. It is known that the work done during revisional Settlement operations in Bengal is on the whole quite reliable. We therefore attempted a comparison between the area under aman paddy as given in the Settlement Reports with the contemporaneous official figures. The material is shown in Table (19) in which col. (1) gives the name of the district; col. (2) the geographical area; and col. (3) the years of Settlement operations; col. (4) the area under Aman paddy as given in the Settlement reports; and col. (5) the average value of the area under Aman paddy as given in the official Season and Crop Reports for the years mentioned in col. (3). The successive official estimates are also given for the years 1934 - 1943 in the succeeding cols. (6) - (15).

51. It will be noticed that the official estimates were usually smaller than the corresponding Settlement figures. In fact the total area according to official estimates was only 144.58 lakhs of acre against a total Settlement figure of 192.16 lakhs of acre. The official estimates have thus to be increased by no less than one third. (or 33 per cent) in order to reach the Settlement figure.

52. A far more important point is that according to Settlement operations the total area under Aman paddy was not less than 192.16 lakhs of acres. In view of the unprecedented rise in prices in 1943 it is almost certain that the area sown with aman paddy in 1943-44 would be something greater than this. On this view of the matter the estimate obtained from the sample survey appear to be far more plausible than the official estimate.

53. We find that the sample estimate of the acreage under aman paddy at the time of harvesting was 18 per cent in excess of the official figure. We have already seen that the standard error of the area under aman paddy as estimated by the sample survey is 5.56 per cent. This shows that the internal agreement between the different sub-samples was on the whole fairly satisfactory. An external comparison with the settlement records shows that the official figures are usually serious under-estimates. In this situation the sample estimate appears to be quite plausible. The margin of error is however large, and the sample estimate may differ from the true value by something like 8 or 9 per cent.

54. It would be remembered that the estimated production of Aus rice (not in husk) was given as 7.70 crores of maunds. We have also seen that a plausible figure for the total production of Aman rice (not in husk) in Bengal in 1943-44 is 23.4 crores of maunds. Adding these two it appears likely that the total production of Aus and Aman rice (not in husk) in Bengal in 1943-44 was something of the order of 31 crores of maunds with a possible margin of error of say 7 or 8 per cent. This is as far as we can go in regard to the production of rice in Bengal in 1943-44 on the basis of available evidence.

**Section 7. Incidence and Effect of manuring on the Yield
of Aman Paddy : 1943-44.**

55. At the time of the survey of aman paddy information was collected regarding the extent of the application of manures. This furnished material for studying how far manures were being used for aman paddy and what effect these had on the yield of the crop. Table (20) shows the extent of the use of manures; col.(1) gives the name of the district, col.(2) the number of plots which were manured and col.(3) the number of plots which were not manured; the total number of plots covered in the tabulation is shown in col.(4). The percentages of plots manured and not manured are shown in cols.(5) and (6). It would be seen that manuring was on the whole quite usual in districts Backergunj, Pacca, Jessore, Khulna, Nadia, Pabna, Faridpur and 24-Parganas. On the other hand, the practice was practically neglected in districts Birbhum, Burdwan, Bankura and Midnapore. The primary material shows that cowdung is practically the only form of manure that is being used in the province; manure in the present report therefore means cowdung alone.

56. Information was also collected as to the amount of cowdung used per bigha, but these are often only rough guesses reported in a casual manner by the cultivators. In fact in many cases it was difficult to find out whether the total quantity of manure reported to have been applied referred to only the particular plot under investigation or all the plots cultivated by the owner.

57. In spite of the rather unsatisfactory nature of the preliminary material we have made an attempt to study the effect of manuring on the rate of yield. Relevant figures are given in Table (21) in which the mean rate of yield of Aman paddy in maunds per acre in plots receiving different quantities of manure have been shown by districts. Under each district the column headed "N" gives the number of plots for which information was available and the second column, the yield. It will be noticed that the quantity of cowdung used varied widely from 1 maund to 150 lbs per bigha.

58. It must be remembered that the comparison which we are making here gives only a kind of over-all average. In the case of unmanured plots we have no information what would have been the yield if manure had been used on the same plot. In the same way, we have records of yields of paddy in manured plots but have no knowledge as to how much less the yield would have been if no manure had been used at all. The comparison is thus not quite valid, as it is quite possible that the intrinsic fertility of the manured and unmanured plots were different. For example, suppose only the 1c at fertile plots were manured, then the increase with noticed would not give the total effect of manuring. On the other hand, suppose only the most fertile plots were manured then a great deal of the observed increase might be due to greater intrinsic fertility rather than to the manure. But looking at the figures given at the bottom of the table for the province as a whole it is interesting to observe that there is clear evidence of an increase in the rate of yield of paddy due to manuring. For example, in unmanured plots the over-all provincial average yield was 16.58 maunds of rice (not in husk) per acre for all districts combined. The average rate of yield is higher and about 17.34 maunds in plots receiving from 1 to 10 maunds of cowdung, and about 17.36 maunds per acre in plots receiving 11 to 20 maunds. There is an appreciable rise in the average yield to 18.35 maunds per acre on land receiving from 21 to 30 maunds of cowdung per bigha. There is further rise to 19.87 maunds per acre of land receiving from 31 to 50 maunds of cowdung per bigha. After this there is no further rise suggesting that there is probably not much additional gain in yield beyond the application of say from 1 to 50 maunds of cowdung per bigha.

59. The material is neither extensive nor reliable enough to bear more detailed analysis. We find however that the use of from 30 to 50 maunds per bigha on the whole increases the yield of rice (not in husk) per acre to 19.87 maunds from an average yield of 16.58 maunds in unmanured plots. There is thus a gain of about 3.25 maunds per bigha on an average due to the use of from 31 to 50 maunds of cowdung per bigha.

Section (8). Eye Estimation of the Yield of Aman Paddy

60. Various experiments have been made in different parts of the world regarding the possibility of making reliable eye estimates of the yield of crops. Several years ago a good deal of work in connexion with wheat was done in England which gave promising results. During Prof. H.A. Fisher's visit to India in 1937-38 I had the opportunity of discussing the question with him. In fact in a memorandum submitted to Lord Linlithgow (then Viceroy of India) Prof. Fisher suggested that experiments on eye estimation might be taken up in India at an early date. We did some work on the subject in a tentative way on the jute crop in 1940. I wanted to make a systematic effort in 1941 but was prevented from doing this on account of my own ill health. In 1942 I again gave instructions for eye estimation work being done on the jute crop but unfortunately owing to unforeseen difficulties and the not unnatural reluctance on the part of the supervising staff in the Field Branch no tangible progress was made. However in 1943 I decided to make a definite effort to explore the possibilities of eye estimation; and, as already mentioned in the introductory section, the results have been extremely promising.

61. Both in the Jute-crop as well as in the aman seasons I decided to offer prizes ranging from Rs.5 to 100 for proficiency in making eye estimates of the yield of jute and paddy. In the aman season examinations were arranged at 12 centres under the direct supervision of Field Supervisors and Statisticians and other senior workers sent out from the Statistical Laboratory. After a number of candidates had assembled at each centre the examiners (who were usually two or three in number) went round and made ready a number of sample-units of the proper size bounded by ropes for being harvested. Before the crop was cut each candidate was required to make an eye estimate of the yield in terms of maunds of rice (not in husk) per bigha, and these estimates were recorded in an answer book. In this way each candidate was required to make an eye estimate of the yield of from 15 to 30 cuts. After all the candidates had actually written down their own eye estimates, the crop on each of the plots was harvested and weighed in the presence of the examiners.

62. At each centre we thus had the weight of crop for each plot as actually measured by the examiners, and corresponding to each such weight we also had a number of values obtained by eye estimate by the different candidates. A specimen sheet of such results is shown in Table (22) in which actual records for a number of prize-winning candidates at Naogaon, Tarakeswar, Singur and Santiniketan are given in terms of maunds of rice (not in husk) per bigha. Col.(1) simply gives the serial number of the sample-unit at each centre. Under Naogaon we then have the different eye-estimates of the yield in maunds per bigha as given by worker Nos. 1, 2, 3, up to 9. This is followed by column headed "All" which gives the mean value of the yield based over the eye estimates of all 9 candidates; finally in the column headed "Actual" the yield as determined by direct weighing by the examiners themselves is given for each sample-unit. At the bottom of the mean value is given of all sample-units for each candidate separately and also for the two columns headed "All" and "Actual". At Naogaon we find that the mean yield for all 15 sample-units was 5.20 maunds per bigha. We also notice that the mean value of the eye estimates made by candidate No.1 was 5.25 by candidate No. 2 was 5.80, by candidate No.3 was 5.20 maunds and so on. A glance at the figures would show that some of the candidates were thus highly successful in giving reliable eye estimates of yield. There were however large differences between the candidates. For example, Naogaon candidate No.9 had a mean yield of 6.98 maunds per bigha again on actual value of 5.45 maunds.

63. The results were scrutinized and analysed in various ways. Agreement of mean values was certainly one criterion. But this was not sufficient. For example we found that there were candidates who consistently under-estimated or over-estimated but whose eye estimate values were more or less uniformly proportional to the actual values. It is clear that in such cases if the candidates could correct their bias they would be able to make extremely reliable eye estimates. This suggested finding the correlation between the eye estimates and the actual values as a second criterion. A candidate having a high correlation of his eye estimates with the actual values may be considered to be a more promising candidate than one having a low correlation. There was also a third factor. A candidate may guess very widely of the mark and yet by chance

chance cancellation of values largely in excess or in defect may reach a mean value near that of the actual value. It is clear that the standard deviation of the errors would throw some light on the ability of the candidates. As between two candidates having roughly the same mean values, the one with lower standard difference would be obviously more promising.

64. It is not necessary to enter into technical details but I may mention here that all these factors were taken into consideration in awarding the prizes. In the Asan season out of 148 candidates 25 were considered deserving of receiving prizes. It was also found that some of the top men had very good aptitude in making correct eye estimates of the yield.

65. Let us just consider for a moment the possibilities of the method. Our experiment shows that we had among our own staff men who could make eye estimates with a high degree of reliability. We found that the mean value based on 20 eye estimates often agreed with the actual value within 2 or 3 per cent. The work takes very little time. All one would have to do is to go round with a map and identify a number of plots selected at random in a village or within a group of villages and make a note of the yield of each such plot by eye estimation. One investigator would in this way be easily able to collect say from 30 to 40 eye estimated values in a group of villages. As already mentioned, we have reasons to believe that the mean value based on such a number of eye estimates would not probably differ from the actual value by more than two or three or say five per cent at the most when the work was done by competent men. Any such investigator moving from place to place would be able to make several hundred of eye estimates in the course of a month.

66. The work done this year therefore deserves being continued in future. The method appears to be extremely promising. But a good deal of further studies must be made before it can be standardized. Suitable men must be found and given necessary training. Finally there is the all important question of honesty. The fact that man is able to make good

good eye estimates does not mean that he would always do so in practice. It is clear therefore that it would not be possible to rely exclusively on eye estimation. Personally I believe that the ~~xxx~~ most promising line of advance would be to us, both eye estimation and the method of actual objective crop-cutting work in combination. Each would then act as a check on the other. Careful control experiments must be made regarding the type of organization, but given a little time and necessary facilities I feel confident that evolving a sound technique would merely be a matter of a little patient experimentation.

Section 9. Uncultivable waste and Fallow Lands.

67. During the survey of the Aman crop information was collected about the proportion of land lying fallow in all the 330 sub-blocks ~~examined~~ covered in the survey. A certain portion of this material picked up at random has been tabulated and the results are given in Table (23) in which col.(1) gives the name of the district; col.(2) the total geographical area in thousands of acres; cols(3) and (4) the number of police stations covered in the survey by the two field parties (A) and (B) respectively. The estimated area of culturable waste in thousands of acre based on the work done by the (A) and (B) parties are shown separately in cols.(5) and (6); and the pooled estimated values in ~~xxx~~ col.(7). In the same way estimated values of current fallow land in thousand acres are given in cols.(8) and (9) respectively for material collected by the two parties (A) and (B) and for the pooled material in col.(10). Finally the total area of culturable waste land or current fallow is shown by two parties (A) and (B) in cols.(11) and (12) respectively; and the pooled values in col.(13).

68. It appears from Table (23) that in the whole of Bengal about 88.3 lakhs of acres were either lying as current fallow or were culturable waste land in 1945-46.

69. For purpose of comparison we are showing Settlement and official estimates of current fallow and culturable waste in Table (24); col.(1) gives the name of the district and col.(2) the year during which settlement operations were made in each district. ~~xxx~~ Estimates of the culturable waste ~~inhabited~~ other than current fallow as given in settlement reports are shown in col.(3) and the area not available for cultivation in col.(4); and finally the total area of current fallow in col.(5); the total of these three items is given in col.(6).

70. The corresponding figures abstracted from the official publication in the "Area and Yield of the Principal Crops in India in 1937-38" is shown in cols.(7) to (9). ~~xxx~~ Area of culturable waste land other than current fallow has been shown in col.(7); the area not available for cultivation in col.(8) and the area of current fallow in col.(9) and finally the total of the items in cols.(7) to (9); is shown in col.(10).

71. It will be noticed that there are many discrepancies between the figures given in Settlement reports and those given in official publication on "Area and Yield of Principal Crops in India in 1937-38" and naturally between those two and the sample estimates. All we can say is that the sample values are of the right order. It is only for the sample survey has been repeated for 3 or 4 years that the real position can become known.

Sd/- P.C.Mahalanobis.
5/5/44.

Table (2). Distribution of Crop-cutting work in the Survey in 1941-42.

Block No.	Block of Districts.	Period of work	Number of Crops Plots			Number of cuts.	
			(4)	(5)	(6)	(7)	(8)
1	Berhampur, Bargarh	24/11 - 25/12	6	240	150	600	150
2	Bargarh, Boudh, Buxa	27/11 - 17/12	5	210	150	500	150
3	Boudh	19/11 - 19/12	6	180	150	500	150
4	Chittanag, Dhenkanal, Khordha	6/12 - 26/12	6	237	240	600	150
5	Dhenkanal	24/11 - 23/12	6	220	150	500	150
6	Dumkani, Boudh	1/12 - 27/12	6	214	150	500	150
7	Boudh, Bargarh	26/11 - 21/12	6	204	150	500	150
8	Dumkani, Boudh	21/11 - 22/12	6	253	120	50	150
9	Boudh, Bargarh, Buxa, Boudh	27/11 - 11/12	6	227	150	500	150
10	Boudh, Bargarh	24/11 - 25/12	6	190	150	500	150
11	Boudh, Bargarh	2/12 - 27/12	4	202	150	500	150
12	Boudh	8/12 - 22/12	6	224	220	600	150
13	Boudh, Bargarh, Boudh	27/11 - 22/12	6	224	150	500	150
14	Boudh, Bargarh, Boudh	20/11 - 27/12	5	234	150	500	150
15	Boudh, Bargarh	20/11 - 23/12	6	220	150	500	150
16	Boudh, Bargarh	20/11 - 23/12	6	180	150	500	150
17	Boudh, Bargarh, Boudh	20/11 - 23/12	6	205	150	500	150
18	Boudh, Bargarh, Boudh	10/12 - 1/12	2	80	40	100	40
19	Boudh, Bargarh	20/11 - 21/12	6	210	150	500	150
20	Boudh, Bargarh, Boudh	4/12 - 25/12	6	215	150	500	150
21	Boudh	1/12 - 24/12	6	200	150	500	150
Total		11/11 - 21/12	119	5776	5000	5000	1570

Table (4): Distribution of Grids by Districts in Assam Census 1943-44.

Name of District	No. of Sub-blocks.			No of Families.			Number of Grids enumerated			
	Dupli- cated	Single.	Total.	Dupli- cated.	Single.	Total.	Dupli- cated.	Single.	Indivi- dual Total.	Actual Total.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Bokorganj	15	8	21	220	451	671	659	1561	2010	2669
Bankura	7	4	11	141	260	401	424	781	1205	1629
Birbhum	7	5	10	145	272	417	444	715	1150	1603
Bogra	7	2	9	178	278	456	555	852	1367	1902
Burwan	5	5	14	168	296	464	508	893	1532	1898
Chittaugong	4	6	6	-	102	102	-	507	507	507
Dacca	18	6	18	558	658	1214	1074	1307	2981	4655
Manipur	15	5	13	288	336	624	808	1180	1392	2765
Faridpur	10	6	16	352	620	972	1355	1562	2316	3871
Ferozshah	4	5	9	54	172	226	165	510	673	842
Furka	2	1	3	38	56	94	110	160	224	339
Jalpaiguri	5	4	11	162	219	371	455	856	1201	1746
Jessore	13	4	17	348	474	822	1045	1421	2466	3511
Jhalna	11	5	14	231	322	553	694	905	1550	2358
Kalish	8	2	10	173	217	390	518	651	1109	1687
Kamrup	17	7	24	311	478	787	953	1428	2381	3294
Karshidabad	8	5	11	177	251	428	520	764	1274	1794
Kamrengh	21	9	30	710	1186	1896	2150	3553	6600	7818
Katia	3	5	14	171	285	456	518	856	1362	1880
Kokhal	4	2	6	101	152	253	303	457	750	1061
Pubna	7	4	11	208	420	628	824	1354	1908	2532
Kajshahi	9	3	12	170	275	445	500	826	1374	1843
Krupur	12	7	19	437	804	1241	1512	2415	3725	5087
Niporah	8	4	12	251	476	727	752	1420	2181	2953
Pa Parganas	12	6	18	271	416	687	813	1248	2061	2874
Total	230	114	344	5633	9520	15153	16895	28641	45556	62431

Table 511 - Sample 26 Mats of the Area Under Aman Paddy in Bengal 1943-44

Name of Districts	Microplike area in the mandal area	Duplicate Sub-Blocks							Single (Non duplicate) Sub-Blocks						
		Number of		Sub-sample (A)			Sub-sample (B)		Number of			Sub-sample (C)			
		Sub-Blocks	Plots	Grids	2 nd mated Area ± standard Error	Percentage variability	2 nd mated Area ± standard Error	Percentage variability	Sub-Blocks	Plots	Grids	2 nd mated Area ± standard Error	Percentage variability		
1 Backerganj	2558	13	220	659	1967 ± 74.2	3.8	1857 ± 110.7	6.0	8	451	1351	1746 ± 175.6	10.1		
2 Bankura	1594	7	141	424	835 ± 59.6	7.1	801 ± 54.4	6.8	4	260	781	1038 ± 108.8	10.5		
3 Birbhum	1116	7	145	444	759 ± 70.2	9.2	777 ± 32.1	4.1	3	272	715	775 ± 53.5	6.9		
4 Bogra	944	7	178	535	635 ± 59.6	9.4	698 ± 59.2	8.5	2	278	832	581 ± 20.2	3.5		
5 Burdwan	1734	7	168	504	1059 ± 130.7	12.3	1152 ± 107.8	9.3	5	276	888	983 ± 238.5	24.3		
6 Dacca	1753	12	358	1074	848 ± 80.6	9.5	729 ± 80.3	8.6	6	636	1907	891 ± 89.1	10.0		
7 Dinajpur	2556	13	268	803	1551 ± 63.6	4.1	1634 ± 77.2	4.7	5	296	1189	1631 ± 145.4	8.9		
8 Faridpur	1505	11	352	1055	796 ± 48.0	6.0	871 ± 75.4	8.7	6	620	1861	953 ± 71.3	7.5		
9 Hooghly	770	4	54	163	391 ± 80.9	20.7	485 ± 53.9	11.1	5	172	516	473 ± 28.8	8.2		
10 Howrah	342	2	38	115	282 ± 7.5	2.7	275 ± 6.7	3.9	1	56	169	236 ± 19.0	8.1		
11 Jalpaiguri	1847	7	152	455	889 ± 20.1	3.4	683 ± 43.8	6.4	4	219	836	835 ± 132.6	15.9		
12 Jessore	1871	13	348	1045	907 ± 122.0	13.4	921 ± 124.8	13.6	4	474	1421	1095 ± 124.2	12.1		
13 Khulna	1592	11	231	694	1148 ± 66.2	5.3	1144 ± 80.6	7.9	3	322	965	1305 ± 87.4	6.7		
14 Kaldah	1275	8	173	518	439 ± 129.5	29.6	479 ± 127.4	25.5	2	217	651	510 ± 185.6	95.3		
15 Kidnapur	3395	17	311	933	1813 ± 131.1	7.5	2057 ± 188.8	7.2	7	476	1428	2128 ± 281.8	13.2		
16 Kusrinidabad	1307	8	177	520	358 ± 112.5	31.4	406 ± 124.3	30.6	3	251	754	205 ± 140.7	47.4		
17 Mymensingh	2913	21	710	2130	1950 ± 207.3	10.6	2221 ± 177.5	8.0	9	1186	2558	2175 ± 228.7	10.5		
18 Nadra	1811	9	171	512	340 ± 235.1	65.3	364 ± 39.5	10.9	5	285	856	482 ± 114.1	23.7		
19 Noakali	894	4	101	302	605 ± 41.3	6.8	584 ± 53.6	9.2	2	152	457	563 ± 323.2	57.5		
20 Patna	1164	7	208	624	789 ± 84.2	10.7	789 ± 38.8	4.9	4	422	1284	832 ± 27.7	3.3		
21 Rajshahi	1411	7	170	507	1078 ± 102.3	9.5	1094 ± 74.3	6.8	3	275	825	585 ± 230.2	39.4		
22 Rangpur	2368	12	437	1312	1276 ± 31.6	2.5	1189 ± 68.1	5.7	7	804	2413	1299 ± 134.8	10.4		
23 Tipperah	1608	8	251	752	1161 ± 22.0	2.0	1029 ± 42.3	4.1	4	476	1429	1044 ± 65.1	6.2		
24 RA Pargana	2276	12	271	813	1359 ± 127.0	7.3	1541 ± 117.4	7.6	6	416	1248	1627 ± 133.8	8.2		
25 Chittagong	1145	-	-	-	632	-	632	-	6	102	307	632 ± 88.3	14.0		
		43546	230	6875	23840	514.9	212	24044	463.9	117	114	2864	24667	887.4	

Table (6) Combined Estimate of Area under Aman Paddy in Bengal in 1945-46 with Sub-Sample comparisons.

Name of Districts	Administrative area in thousand acres	Number of Sub-Blocks	Sheets	Grids	Combined Estimate		Percent variability	Sub-Sample comparisons (Fisher's %)		
					Estimated area + Standard Error	Percent		A-B	B-C	C-A
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
1. Backerganj	2508	4	891	2663	1677 + 73.5	3.9	0.85	1.16	0.55	
2. Bankura	1634	18	542	1623	867 + 45.1	5.2	0.42	1.64	1.35	
3. Birbhum	1218	17	562	1603	770 + 31.5	4.1	0.23	0.22	0.02	
4. Bogra	3944	16	634	1932	655 + 28.8	4.4	0.75	0.86	1.87	
5. Burdwan	1742	20	632	1036	1008 + 37.8	9.1	0.72	0.28	0.76	
6. Dacca	1733	30	1352	4953	803 + 48.2	5.4	0.71	0.38	0.32	
7. Dinajpur	2556	31	932	2735	1609 + 58.8	3.7	0.35	0.50	0.03	
8. Faridpur	1335	26	1324	3971	864 + 39.1	4.4	0.64	1.35	0.79	
9. Hooghly	770	13	280	842	451 + 34.9	7.7	0.37	0.01	0.18	
10. Howrah	142	5	132	93	273 + 8.4	3.1	0.55	2.25	1.79	
11. Jalpaiguri	1647	18	523	1746	737 + 47.6	6.0	0.33	0.40	1.03	
12. Jessore	2071	30	1170	3511	310 + 71.4	7.7	0.38	0.38	0.53	
13. Shulin	1532	25	784	2353	1153 + 45.4	3.9	0.33	1.44	2.61	
14. Malda	1476	15	583	1687	473 + 172.9	33.6	0.34	0.15	1.02	
15. Malnapur	3395	41	1038	3294	2030 + 121.8	6.0	1.05	1.04	0.24	
16. Murshidabad	1837	19	605	1734	383 + 73.3	13.5	0.39	0.23	0.53	
17. Nyaonisingh	3268	51	2606	7818	2104 + 213.7	5.6	1.03	0.73	0.19	
18. Nadia	1611	20	627	1680	386 + 68.1	22.7	0.32	0.37	0.98	
19. Noakhali	804	10	354	1061	586 + 110.1	18.8	0.1	0.13	0.06	
20. Palna	1164	15	644	2532	801 + 32.2	4.0	-	0.49	0.90	
21. Rajshahi	1611	31	615	1843	937 + 87.8	9.2	0.13	1.96	2.10	
22. Rangpur	2038	31	1678	5037	1249 + 51.4	4.1	1.16	0.17	0.75	
23. Tipperah	1638	20	978	2933	1084 + 36.3	3.5	1.23	1.35	0.19	
24. Parganas	1476	30	958	2874	1538 + 72.9	4.7	1.05	2.45	0.48	
25. Chittagong	1645	6	102	307	632 + 60.3	24.0	-	-	-	
Total	43546	574	29786	62431	24446 + 375.3	1.5	0.33	0.61	0.62	

Table (7): Estimated Ground Variances Aman Paddy Sub-Sample (A) 1945-44.

Districts.	Between Grids within Sub-blocks.		Between Sub-blocks.		Estimate of	Variance of	
	D.F.	Variance,	D.F.	Ratio.	St. ge. Bet. Sub-block	mean, between grids within sub-block	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	
1	Backerganj	1002	28.52	14	10.57	4.10	28.82
2	Banarua	653	63.08	6	5.17	2.73	63.08
3	Birbhan	667	51.09	6	20.62	10.43	51.09
4	Bogra	829	45.49	6	27.35	9.67	45.49
5	Burdwan	868	50.49	9	37.06	21.01	50.49
6	Dacca	1523	45.68	11	25.57	8.76	45.68
7	Dinajpur	946	51.05	10	4.48	2.05	51.05
8	Faridpur	1611	38.87	9	18.15	3.65	38.87
9	Hooghly	259	59.52	3	15.51	13.91	59.52
10	Howrah	133	30.03	1	1.06	0.03	30.03
11	Jalgaiguri	562	59.40	6	5.77	3.61	59.40
12	Jessore	1561	53.10	12	42.90	19.16	53.10
13	Khulna	1036	32.49	11	20.42	7.28	32.49
14	Kulna	739	32.28	7	85.62	29.17	32.36
15	Lalbagur	1562	49.83	17	19.96	10.78	49.53
16	Murshidabad	775	39.63	7	57.37	22.83	39.63
17	Dymonningh	2934	35.97	20	83.08	20.34	35.08
18	Nadia	639	38.51	8	12.67	5.73	38.51
19	Hooghly	459	37.47	4	8.54	5.21	37.47
20	Pabna	852	49.22	6	46.32	18.16	49.22
21	Rajshahi	815	35.37	9	44.49	18.35	35.37
22	Rangpur	1988	45.26	11	21.95	0.60	45.26
23	Tipperah	1193	44.86	7	1.94	0.23	44.86
24	24 Barganas	1233	54.22	12	25.62	13.56	54.22
25	Chittagong						

Table (9) : Estimated Ground Variances : Aman Paddy Sub-Samples (B) 1943-44.

Districts	Between grids within Sub-blocks.		Between Sub-blocks.		Estimated of variance of Stage mean.	
	D.F.	Variance.	D.F.	Ratio.	σ^2	σ^2
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1 Backerganj	946	56.83	14	17.41	9.51	36.83
2 Bankura	624	67.52	6	3.81	2.11	67.52
3 Birbhum	658	54.75	6	3.91	1.69	54.75
4 Bogra	635	38.42	6	25.72	9.60	38.42
5 Burdwan	741	52.13	9	22.65	15.06	52.13
6 Dacca	1452	44.06	11	25.01	8.87	44.06
7 Dinajpur	980	48.24	10	6.92	3.23	48.24
8 Faridpur	1328	42.04	9	34.85	9.33	42.04
9 Hooghly	229	62.28	3	6.38	6.01	62.28
10 Howrah	208	40.29	1	0.06	0.00	40.29
11 Jalpaiguri	546	58.39	6	0.93	0.00	58.39
12 Jessore	1342	50.39	22	48.02	20.33	50.39
13 Khulna	1334	42.69	11	21.97	10.40	42.69
14 Malda	662	42.00	7	43.17	22.13	42.00
15 Midnapur	1532	43.86	17	42.88	21.10	43.86
16 Murshidabad	671	39.41	7	59.28	27.24	39.41
17 Mymensingh	3086	40.15	20	58.12	15.55	40.15
18 Nadia	785	47.55	8	3.15	1.16	47.55
19 Noidadhi	494	53.48	4	18.64	6.11	53.48
20 Pubna	773	46.03	6	6.78	2.43	46.03
21 Rajshahi	927	48.12	9	15.42	7.46	48.12
22 Rangpur	1302	48.88	11	12.65	3.79	48.88
23 Tipperah	1128	47.07	7	6.09	1.71	47.07
24 24 Pabna	1255	46.56	12	28.03	12.00	46.56
25 Chittagong						

Table (3) : Estimated Ground Variances; mean Paddy Sub-Samples (C) 1943-44.

Districts.	Between Grids within Sub-block.		Between Sub-blocks.		Estimates of Variance of Stage means, Sub-blocks, within Sub-block	
	D.F.	Variance.	D.F.	Ratio.	σ_1^2	σ_2^2
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1 Backerganj	684	56.56	7	54.80	14.32	86.58
2 Bankura	339	55.81	3	11.80	59.59	55.81
3 Birbhum	268	49.18	2	5.06	2.21	49.18
4 Bogra	315	57.88	1	0.79	-	57.88
5 Burdwan	265	49.67	3	29.90	76.32	49.67
6 Dacca	924	42.88	5	22.18	5.88	42.88
7 Dinajpur	598	50.71	6	12.81	7.15	50.71
8 Faridpur	959	42.47	5	18.83	4.66	42.47
9 Hooghly	325	54.58	3	5.97	5.52	54.58
10 Howrah	-	-	-	-	-	-
11 Jalpaiguri	259	59.36	2	8.49	4.66	59.36
12 Jessore	371	72.55	3	6.69	4.28	70.50
13 Khulna	266	32.40	2	10.00	3.25	32.46
14 Maldah	135	16.04	1	413.67	106.98	16.04
15 Meänapur	437	46.88	3	29.27	15.98	46.18
16 Murshidabad	331	46.09	2	23.91	13.73	46.09
17 Nymensidai	1415	44.38	8	40.44	11.15	44.38
18 Nadia	437	48.66	4	13.61	7.05	48.66
19 Noakhali	-	-	-	-	-	-
20 Pabna	544	55.72	3	3.52	0.65	55.72
21 Rajshahi	-	-	-	-	-	-
22 Rangpur	1091	44.05	6	35.01	9.55	44.05
23 Tipperah	613	41.33	3	9.85	2.65	41.33
24 24 Parganas	354	56.39	4	13.35	0.29	56.39
25 Chittagong	326	59.37	5	9.63	6.15	59.39

Table (10) Percentage frequency distribution of grid proportions under Aman Paddy
(Based on approximately equal number of grids)

Class Interval	Blocks																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	All
.00	9.4	13.4	18.3	6.7	24.5	14.2	14.4	16.1	8.5	21.7	15.4	13.0	41.4	60.8	59.4	12.8	22.2	11.9	20.4	21.2	26.0	21.2
.05	1.2	1.8	4.2	2.7	0.8	3.0	0.8	2.0	2.0	2.7	3.4	3.2	3.0	1.5	2.7	0.8	2.3	1.4	1.7	2.2	1.9	1.7
.10	1.1	1.7	4.0	2.1	1.4	2.4	1.0	2.6	1.8	2.6	2.3	3.4	2.6	1.6	1.7	1.9	1.8	1.5	1.6	2.2	2.0	1.4
.15	1.1	1.9	2.7	1.7	0.9	2.2	2.4	2.4	2.5	2.3	2.4	2.6	1.5	1.3	1.7	1.0	1.7	1.1	1.1	1.5	1.7	1.3
.20	1.2	3.2	3.3	2.2	0.7	2.0	1.4	2.4	1.9	2.2	2.0	2.4	1.7	1.2	1.5	0.9	2.0	1.2	1.3	1.8	1.8	1.0
.25	1.7	3.0	2.8	2.4	0.8	2.0	1.5	2.3	2.3	2.9	1.6	2.4	1.7	0.5	1.4	1.0	2.2	1.2	1.4	1.2	2.0	1.5
.30	1.9	3.4	3.0	1.7	1.3	2.3	1.6	2.3	1.7	2.5	2.8	2.9	1.1	0.8	1.8	1.1	1.5	0.9	1.5	1.4	1.5	1.1
.35	1.6	3.6	3.5	2.2	1.2	2.3	1.7	2.8	2.3	2.7	1.6	1.8	1.6	1.2	1.0	1.2	1.4	1.1	0.9	1.5	0.9	1.3
.40	2.0	3.6	3.0	2.7	2.1	2.6	1.7	2.9	2.1	2.9	2.3	2.6	1.7	0.8	1.1	1.4	1.5	1.0	1.4	2.1	1.6	1.2
.45	2.1	4.2	2.6	2.3	1.8	2.6	2.3	2.3	2.2	3.1	2.8	2.8	1.4	0.9	1.1	1.3	1.6	0.9	1.3	1.4	2.5	1.5
.50	2.2	4.4	3.6	2.8	2.2	3.3	2.2	3.7	2.5	3.5	2.9	3.1	2.0	0.9	1.1	1.8	1.7	1.2	1.2	1.7	1.9	2.3
.55	2.4	4.7	3.0	2.6	1.6	2.4	2.9	3.4	2.9	3.1	2.8	2.6	1.5	0.7	1.3	1.7	2.0	0.9	1.6	1.8	1.6	2.1
.60	2.8	4.3	3.2	2.9	2.2	3.1	2.4	2.8	2.6	3.7	2.6	3.2	1.5	1.2	1.5	1.3	1.6	1.4	2.1	2.2	1.7	1.7
.65	2.5	4.0	3.2	2.8	2.4	3.0	2.6	4.0	2.8	3.5	3.2	3.6	1.8	1.2	1.4	2.2	2.3	1.3	1.2	2.2	1.6	1.9
.70	2.7	4.1	3.9	3.2	2.4	3.2	2.9	4.2	2.4	3.4	2.7	3.1	2.0	1.1	0.9	2.4	2.1	1.6	2.5	1.7	2.3	2.1
.75	3.7	4.2	3.8	3.5	2.6	3.8	2.8	3.4	3.2	3.1	3.0	3.4	1.4	1.2	1.0	2.4	2.1	2.0	2.4	1.5	2.2	2.0
.80	3.6	3.6	3.4	3.6	3.0	4.6	2.8	4.2	3.3	3.5	3.7	3.4	2.2	1.0	0.7	2.5	2.9	1.7	2.3	2.5	2.2	2.6
.85	4.1	3.6	3.2	3.7	3.4	4.4	3.8	4.7	3.1	3.4	3.7	3.3	2.6	1.6	1.2	3.3	3.4	3.3	2.4	3.1	2.8	2.4
.90	6.0	3.3	3.6	5.5	3.9	5.0	4.2	4.3	4.5	4.7	6.1	4.4	2.7	2.0	1.0	3.6	5.7	5.0	3.0	4.0	3.5	3.8
.95	6.5	3.5	3.4	7.1	5.8	5.5	6.2	3.9	5.5	5.6	7.2	6.6	3.6	1.8	1.4	6.3	5.1	5.6	5.0	4.6	4.6	5.1
.00	40.2	20.7	18.3	35.6	35.0	26.1	38.4	23.3	40.0	16.9	25.5	26.2	21.0	17.0	15.1	49.9	32.9	53.8	43.7	38.2	33.7	40.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table (4) Progressive Estimate of The ~~Proportion~~ Land Under Aus Paddy (Summer Survey 1943-44) by District

Period of Survey	Dumuria		(874) Sundarban		(1094) Burdwan		(1116) Bardhaman		(1734) Dacca		(1755) Faridpur		Hazaribagh		(770) Hooghly		(312) Jalpaiguri		(1847) Jessore		(1871) Khulna		(1592) Maldah		(1275) Medinipur		(3375) Purnia		(5163) Rangpur		(2097) Nadia		(1882) Nandia		(874) Rajshahi		(611) Tippera		(1602) Barisal		(2276) Total			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)	(41)	(42)	(43)		
4/6 - 31/5	3	.25							5	.24	2	.25						1	.97	2	.09					5	.22	1	.12	2	.04					3	.27	1	.04	2	.22	2	.24	
1/6 - 8/6	4	.27							6	.33	2	.17						2	.31	2	.08					5	.14	1	.27	3	.14				1	.20	1	.50	2	.01	3	.17	2	.24
9/6 - 5/16	1	.20							5	.27	1	.11						2	.08	3	.15					4	.23	1	.44	3	.16				1	.01	2	.26	2	.14	2	.25	5	.15
11/6 - 24/6	3	.17							4	.18	4	.17						1	.34	5	.06					5	.28	1	.12	2	.19				3	.15	2	.25	6	.07	2	.25	5	.14
24/6 - 24/6	3	.08							5	.17	2	.20						2	.23	3	.04					7	.22	2	.22	1	.33				2	.43	2	.01	2	.29	2	.17		
1/7 - 8/7	3	.23							3	.46	4	.17						3	.3	3	.03					7	.32	3	.21		.015				1	.22	1	.63	2	.24	4	.21		
9/7 - 15/7	3	.21	1	.01			2	.07	1	.05	1	.15						1	.11	5	.04					2	.24						.21	2	.59	1	.20	1	.19	4	.24			
14/7 - 21/7	3	.22	2	.14		.03	3	.03	1	.06		.20						2	.01	3	.29	1	.08	2		4	.11						.10	4	.23	1	.25	1	.51	4	.26			
24/7 - 31/7	5	.25			2	.01	2	.03	1	.06		.24						1	.07	3	.04	2	.08	2		5	.07	6	.14	3	.23				2	.29	1	.33	2	.04	3	.27		
1/8 - 8/8	2	.12	1	.03	3	.01	3	.03				.15	2		.05	2			.07	6	.24	2	.02			2	.01	3	.03	2	.3	2	.14	1	.08	1	.09	3	.28	1	.03	3	.46	
9/8 - 15/8	1	.13	2	.03	2	.03	2	.03				.06	2		.05				.02	2	.19					5	.03	2	.4	3	.01				1	.21	1	.06	1	.40	2	.40		
14/8 - 23/8	3								3				2						.02	2	.28					5									2									
24/8 - 31/8	3								3				2						.01	2	.47					5																		
1/9 - 8/9	2												2						.02	1						5																		
9/9 - 15/9	1												2						.02							5																		
16/9 - 23/9	2												2						.02							5																		

Table (14.)

Progressive estimates of the proportion of Land Under Aman paddy Winter Survey 1943-44 by Districts

Period of Survey	Bachergangy (2568)		Bankura (1694)		Bimham (1116)		Burdwan (1731)		Dacca (1753)		Faridpur 1606		Hooghly (770)		Howrah (342)		Jalpaiguri (1847)		Jessore (1871)		Khulna (1692)		Maldah (1275)		Midnapore (3355)		Mymensingh (3963)		Mysore (10307)		Nadia (1811)		Noakhali (894)		Raysahi (1611)		Tepperia (1608)		24 Parganas (2276)		All Districts		
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean			
15/9-22/9	2	0.873					40	0.632			33	0.77													45	0.910	33	0.637			129	0.331	18	0.414			18	0.619	85	0.488	114	0.657	
23/9-30/9	207	0.827	57	0.564			72	0.730	56	0.468	275	0.638			49	0.685	48	0.401	244	0.503	131	0.769			42	0.700	654	0.664	71	0.379	213	0.363	180	0.701	147	0.156	30	0.607	111	0.680	334	0.591	
1/10-7/10	114	0.751	117	0.504	48	0.859	207	0.640	187	0.498	282	0.653			31	0.713	235	0.461	278	0.601					217	0.665	194	0.72	14	0.164	193	0.150	108	0.634	134	0.312			115	0.713	222	0.537	
8/10-15/10	35	0.713	121	0.562	15	0.784	158	0.538	120	0.666	465	0.563							312	0.437	293	0.652			335	0.606	181	0.688	93	0.405	121	0.205			45	0.242	73	0.572	30	0.936	111	0.519	
16/10-23/10	94	0.770	127	0.453			131	0.600			514	0.572							308	0.585	479	0.640	18	0.515	230	0.646	210	0.601	229	0.394	128	0.138	130	0.764	83	0.755	347	0.643			39	0.545	
24/10-31/10	86	0.687	86	0.552	114	0.646	106	0.706	95	0.572	529	0.596	81	0.692			54	0.502	194	0.338	249	0.683	60	0.707	232	0.706	197	0.615	153	0.239	34	0.283	126	0.587	63	0.672	324	0.732	76	0.922	317	0.542	
1/11-7/11	53	0.822			90	0.806	87	0.666			226	0.67			18	0.745					226	0.778			235	0.670	138	0.719	159	0.086	60	0.193			102	0.804	33	0.654	42	0.900	54	0.558	
8/11-15/11	15	0.916					166	0.604			17	0.557	27	0.244								21	0.873			39	0.837			30	0.066	40	0.134			30	0.247	175	0.680	29	0.575	111	0.528

Table (16) Comparison of Yield of Aman Paddy based on cuts of size (12' x 12') and (6' x 6')

rial of ald dt.	no. of houzes	mean yield of paddy in tolns per - sq. feet.				No. of dif erences in Yield (12'x 12')-(6'x 6') i.e. (u)-(v) in excess betweu Smaller of + 5. +5 and -5. torn -5.		
		12' x 12' out (u) Sample (A).	12' x 12' out (u) Sample (B).	6' x 6' cut (v) Sample (A).	6' x 6' cut (v) Sample (B).	(7)	(8)	(9)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	54	24.74	23.58	24.54	21.87	29	6	19
2	41	17.47	17.23	22.80	22.95	8	2	35
3	48	14.72	13.19	21.62	20.94	13	0	36
4	14	13.50	14.89	21.35	18.00	5	1	8
5	74	14.02	13.78	20.02	19.55	4	1	55
6	13	20.37	20.71	20.71	20.64	5	0	8
7	53	19.74	18.65	18.97	17.76	17	13	26
8	41	12.43	11.78	19.71	19.45	3	1	37
9	57	18.21	17.58	21.79	20.60	22	1	54
10	65	18.51	19.36	22.14	22.20	24	2	40
11	54	13.25	17.58	20.87	20.57	12	0	42
12	54	19.39	17.99	22.60	22.89	12	1	41
13	41	16.24	17.40	22.65	22.49	9	1	30
14	45	17.98	16.73	20.00	23.85	13	3	27
15	11	11.47	11.28	23.63	23.92	0	0	15
16	52	21.25	23.02	34.49	33.13	7	1	45
17	35	22.78	22.68	32.92	27.61	18	1	20
18	24	15.69	13.70	23.87	24.17	2	1	21
19	61	20.23	19.95	25.86	24.12	27	5	30
20	43	6.14	6.52	28.76	27.74	1	1	47
21	21	11.20	9.84	12.55	13.71	7	2	11
Total	847	16.96	16.09	21.93	21.36	233	36	622

Estimated area under Aman Paddy before and at harvest time.

Name of District.	Geographical area in 1959 acres.	Main Area (Pre-harvest) Survey				Area Survey at Harvest time.					
		Number of Sub-Sheets, Grids, Block.		Estimated area under main paddy + standard error.		Number of Sub-Sheets, Grids, Block		Estimated Area under Aman paddy + Standard error.			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)		
Buckerganj	248	84	831	2669	1577	+ 75.5	8	36	769	1618	+ 221.1
Bankura	1878	18	543	1629	387	+ 45.1	4	60	480	831	+ 80.8
Birbhum	3116	17	582	1605	770	+ 51.3	4	60	480	537	+ 80.1
Bogra	344	16	634	1902	685	+ 28.8	3	50	240	873	+ 60.4
Burdwan	1750	3	632	1896	1030	+ 97.8	2	30	240	1132	+ 289.1
Faltingong	1445	6	102	307	632	+ 88.3	1	15	120	802	+ 70.7
Jabca	1735	39	1332	4054	369	+ 48.2	3	102	316	638	+ 141.5
Majpur	2536	31	932	2735	1639	+ 58.0	6	90	720	1366	+ 151.1
Medinipur	1535	26	1324	3971	869	+ 38.1	4	59	472	762	+ 79.3
Mughly	1771	13	230	642	451	+ 56.3	-	-	-	(370)*	
Narail	144	3	132	399	270	+ 8.4	-	-	-	(157)*	
Nilpatpur	1147	13	525	1747	797	+ 47.6	3	45	360	981	+ 68.5
Paraganas	3421	20	1170	3511	930	+ 71.4	5	71	568	664	+ 85.3
Balua	1532	25	734	2853	1153	+ 45.4	4	58	464	1118	+ 64.8
Balutab	1275	18	563	1687	473	+ 172.9	4	60	480	323	+ 143.9
Bidnapur	3325	21	1036	3294	1030	+ 121.8	7	104	832	1412	+ 211.2
Birebidabad	1307	13	605	1734	333	+ 73.8	4	59	472	761	+ 58.2
Buachingh	1445	31	2636	7818	4194	+ 118.7	19	242	1336	1724	+ 239.0
Budia	1812	23	627	1880	396	+ 85.1	6	75	603	277	+ 81.3
Buainia	834	13	354	1061	586	+ 110.1	2	30	240	335	+ 59.9
Bubna	1124	13	344	253	301	+ 32.2	6	85	680	477	+ 58.3
Bujshani	1611	21	615	1643	337	+ 87.6	5	75	603	773	+ 139.5
Bugpur	2303	31	1878	5037	1449	+ 51.4	7	104	832	1123	+ 168.0
Bupperah	1630	20	878	2353	1064	+ 26.9	5	45	360	785	+ 206.1
B Parganas	2172	10	358	2374	1336	+ 72.9	6	84	672	1123	+ 193.2
Bangal	43345	574	20786	62451	24446	+ 375.3	119	1679	13432	21855	+ 675.0

Table (17) Yield per acre and Production of Aman Rice : 1961-62.

Name of District.	Geographical area in thousand acres.	Coverage of Crop cutting work in terms of the number of			Yield of Rice (not in husk) in maunds per cropped acre.	Total Production of Rice (net in husk) in thousand maunds based on area as estimated during	
		Sub Blocks.	Sheets	Cuts (12' x 12')		Main Survey.	Harvest Survey time.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1 Backerganj	2633	6	96	168	14.38	26999	26150
2 Bankura	1694	4	63	-	15.80	13636	13219
3 Bhabhua	1116	4	87	120	12.10	9316	4882
4 Bogra	945	5	37	59	14.27	9045	12522
5 Burwan	1731	2	31	558	10.58	*11426	12502
6 Chittagong	1645	1	15	-	10.32	6840	8319
7 Dacca	1755	8	102	196	9.19	8147	5847
8 Dinajpur	2556	6	97	168	10.24	16373	14700
9 Faridpur	1235	4	57	117	10.67	8216	7329
10 Ferozpur	773	-	-	556	13.26	* 6682	5738
11 Ghazipur	1145	-	-	270	9.28	* 2595	1549
12 Jalpaiguri	1647	3	45	82	10.51	8376	9259
13 Jessore	1371	5	71	133	8.78	8161	7582
14 Khulna	1692	4	56	94	14.70	16946	16451
15 Malda	1375	4	67	58	8.30	8979	2761
16 Namopore	1135	7	104	126	6.51	13322	9197
17 Narendrapur	1107	4	59	114	9.59	3674	7300
18 Narsingdi	2353	19	242	326	7.22	16262	15489
19 Nona	1211	6	75	146	7.39	2867	2047
20 Noakhali	834	2	30	58	10.82	6369	3624
21 Patna	1164	6	85	164	10.47	8359	4996
22 Rajshahi	1311	5	75	143	10.60	13371	6136
23 Rangpur	1103	7	104	128	9.23	11398	10419
24 Tippera	1506	3	45	106	14.13	15968	11091
25 24 Parganas	2276	6	84	112	11.83	18165	13260
Total	45536	113	1673	4739	10.80	264327	20916

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figure

Table (28);

Total Production of Aman Rice in Bengal in 1943-44.
In thousand mounds calculated by mathematical formula (ATP)

Name of district	Geographical area in thousand acres.	Area under Aman Paddy in thousand acre			Yield of Rice (net in husk) in mounds per acre.			Total production of Rice (net in husk) in thousands.		
		Mean	+ S.E.	P.V.	Mean	+ S.E.	P.V.	Mean	+ S.E.	P.V.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Backerganj	2566	1801	+ 211	11.7	16.15	+ 9.85	5.1	29527	+ 4795	16.5
Bankura	1694	888	+ 81	9.1	9.95	+ 1.25	12.1	9419	+ 1438	15.3
Birbhum	1116	876	+ 50	5.2	15.20	+ 1.09	8.5	11374	+ 449	5.8
Bogra	2944	395	+ 60	15.5	8.25	+ 1.21	14.7	3719	+ 568	9.9
Burdwan	1751	1127	+ 289	25.6	19.76	+ .78	7.2	15685	+ 1438	9.2
Dacca	1753	572	+ 142	24.8	11.37	+ .66	5.8	6321	+ 1955	28.8
Elkhajpur	2522	1437	+ 151	10.5	12.49	+ .45	3.5	23277	+ 2400	11.6
Faridpur	2505	369	+ 80	21.7	11.77	+ .71	16.5	4335	+ 854	18.1
Hooghly		578						6882		
Howrah		173						2515		
Jalpaiguri	2627	881	+ 87	7.6	11.12	+ .91	8.2	9999	+ 1375	16.8
Jessore	1371	865	+ 85	5.5	10.01	+ .20	12.0	6619	+ 1405	17.0
Khulna	2332	1152	+ 65	5.7	14.85	+ .91	6.1	16886	+ 1585	9.4
Kaldah	1275	329	+ 144	45.6	13.23	+ 1.61	15.7	6367	+ 1872	29.4
Kishorepur	2505	1429	+ 211	14.9	8.50	+ 1.49	17.6	14621	+ 2518	17.2
Kurichidson	1807	791	+ 58	7.5	11.41	+ .68	8.0	3323	+ 615	7.4
Lynchburg	2522	1811	+ 239	15.2	9.55	+ .43	4.5	22375	+ 2355	11.9
Nadia	1441	515	+ 81	25.9	8.18	+ 1.15	14.1	3301	+ 934	27.5
Northchulna	294	355	+ 60	18.0	12.02	+ .76	8.5	4454	+ 120	2.5
Pabna	1164	475	+ 58	12.5	11.62	+ .52	4.5	5573	+ 649	11.6
Rajshahi	1611	772	+ 140	18.1	11.80	+ 1.57	11.6	9247	+ 2235	23.1
Rangpur	2308	776	+ 108	12.5	11.62	+ 1.27	11.0	13643	+ 2009	14.5
Tripura	1608	352	+ 208	59.1	1.71	+ 5.45	25.2	5842	+ 2363	59.7
24 Parganas	2276	1106	+ 180	16.5	14.47	+ 2.02	16.5	15995	+ 2267	14.2
Chittagong		322						8519		
Total	43546	13169	+ 6715	8.56	11.53	+ 9.25	7.46	266413	+ 93668	5.74

Table (19) Area under Aman Paddy in thousands of acres, 1934-1943

Name of District	Geography Area in thousands	Settlement Period			Season and Crop									
		Year	Settlement	Seasoning	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Backerganj	2568	1900-08	1313	1107	1416	1415	1430	1430	1430	1430	1430	1340	1380	1400
Bankura	1694	1917-24	440	563	384	361	420	397	411	413	398	426	412	427
Birbhum	1116	1924-32	610	533	339	453	633	595	628	620	267	578	601	620
Bogra	944	1922-29	502	338	370	388	390	390	370	390	370	390	390	580
Burdwan	1751	1927-34	672	572	400	390	561	514	547	573	435	657	460	623
Chittagong	1645	1923-33	564	435	441	442	442	442	450	442	442	442	442	486
Dacca	1753	1910-17	732	626	638	660	657	667	638	671	633	771	764	800
Dinajpur	2556	1934-40	1474	798	795	796	801	824	830	842	702	830	712	1063
Faridpur	1505	1904-14	813	503	745	817	809	861	828	849	803	929	921	950
Hooghly	770	1930-37	412	211	168	190	270	270	278	245	251	230	265	280
Howrah	342	1934-39	196	94	94	84	100	102	101	85	196	179	193	196
Jalpaiguri	1847	1906-16	684	512	401	397	399	328	359	398	375	400	335	331
Jessore	1871	1920-24	715	492	400	390	401	368	472	469	469	477	482	560
Khulna	1592	1920-26	905	761	768	755	793	790	730	780	855	887	888	1010
Maldah	1275	1928-35	363	223	120	130	136	121	122	129	109	259	136	310
Midnapur	3395	1911-17	1537	1488	1437	1138	1350	1408	1201	1383	1303	1463	1419	1393
Murshidabad	1307	1924-32	425	296	186	256	438	433	429	429	395	430	412	438
Nymensingh	3963	1908-19	1456	982	1407	1415	1415	1430	1457	1430	1412	1445	1456	1517
Nadia	1811	1918-26	370	154	125	152	175	280	300	290	300	306	306	330
Noakhali	894	1914-18	601	614	690	670	589	680	680	670	640	505	560	595
Pabna	1664	1920-29	461	403	481	500	502	497	458	503	458	496	456	514
Rajshahi	1611	1912-22	823	593	655	721	729	719	627	654	621	800	691	726
Rangpur	2308	1931-38	1069	667	651	661	680	685	690	625	300	690	532	652
Tippurah	1608	1915-19	906	780	821	821	813	813	792	766	778	884	923	980
24 Parganas	2276	1924-33	1172	730	731	730	740	779	884	883	873	948	950	1032
	43546	-	19216	14458	14655	14732	15703	15823	15762	15995	14814	16812	16106	17272

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Table (2) Effect of Bon dung manuring on the yield of Amara Paddy on mounds
per acre 1943-44

Districts	1st		1-10 mds		11-20 mds		21-30 mds		31-50 mds		50-75 mds		76-100 mds		101-150 mds		Average	
	N	yield	N	yield	N	yield	N	yield	N	yield	N	yield	N	yield	N	yield	N	yield
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)		
1) Bhekerganj	68	24.07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	168	24.00
2) Bhanupur	6	6.31	2	11.34	34	13.84	20	15.31	24	16.75	8	16.52	4	16.07	-	-	93	14.62
3) Birkhann	-	-	-	-	24	19.36	14	21.59	32	20.41	20	20.72	18	23.33	12	22.04	20	21.0
4) Bogra	24	13.84	-	-	14	22.01	10	30.25	28	14.18	-	-	-	-	2	18.91	78	17.66
5) Birkhann	8	16.52	4	11.34	10	14.37	18	17.02	16	17.96	-	-	-	-	-	-	56	16.33
6) Dacca	144	17.47	-	-	4	22.64	4	18.91	4	18.91	4	18.91	-	-	-	-	160	17.70
7) Dinajpur	46	14.52	4	28.36	28	17.47	39	18.64	40	21.21	16	18.53	4	18.91	-	-	176	18.34
8) Faridpur	98	18.04	-	-	2	15.12	4	22.69	4	19.85	-	-	-	-	-	-	108	18.49
9) Gajipur	6	11.73	8	19.36	12	11.15	2	18.91	-	-	-	-	-	-	-	-	84	16.41
10) Jessore	114	15.43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	114	15.43
11) Khandua	86	22.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	86	22.50
12) Meherpur	24	12.97	20	15.31	10	21.17	2	18.91	2	34.98	-	-	-	-	-	-	58	18.15
13) Medinipur	16	15.12	52	15.12	24	12.25	20	13.69	31	11.34	20	10.84	-	-	-	-	168	17.37
14) Murshidabad	62	14.11	6	12.59	16	19.74	2	18.91	18	22.46	-	-	-	-	-	-	104	16.78
15) Nizamanpur	322	14.63	88	15.81	58	14.41	10	21.17	20	23.25	4	11.34	8	17.02	2	15.12	512	17.29
16) Nadia	134	11.99	-	-	-	-	4	11.53	-	-	-	-	-	-	-	-	138	11.98
17) Noakhale	12	17.02	18	16.60	14	19.06	4	23.14	2	24.58	6	22.38	2	20.80	-	-	58	17.72
18) Pabna	164	17.81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	164	17.81
19) Rajshahi	38	14.77	38	16.60	6	22.64	10	21.36	10	20.23	6	23.63	-	-	-	-	108	16.64
20) Rangpur	66	17.51	36	17.90	56	19.51	18	16.34	6	11.34	4	20.80	6	22.04	4	26.47	196	17.77
21) Sirajah	16	18.30	36	24.50	20	18.72	2	17.02	8	15.81	8	16.07	2	18.91	-	-	92	26.38
22) Faragana	112	21.25	-	-	-	-	10	24.96	4	24.58	-	-	-	-	-	-	126	21.65
	1716	16.58	312	17.34	655	17.38	143	18.85	244	17.87	96	16.97	44	19.03	20	19.62	2972	17.71

S.R. Rinnow
Director

Table (22); Eye estimate of the yield of Aman paddy in mainnds per Bigha: 1943-1944

Sample Unit No	Narsingam										Tarakeswar								Singur					Santuriketa								
	1	2	3	4	5	6	7	8	9	All	Actual	1	2	3	4	5	6	7	8	All	Actual	1	2	3	4	All	Actual	1	2	All		
1	4.0	3.0	3.8	4.0	3.5	4.5	2.5	3.8	6.5	3.9	3.5	9.5	7.0	8.0	1.5	9.2	8.0	8.0	8.0	8.0	8.0	9.9	8.0	6.7	8.5	8.0	8.6	8.7	3.9	5.0	4.2	6.1
2	4.0	3.5	4.0	3.5	3.0	4.0	2.0	3.5	5.0	3.6	3.2	9.5	8.0	9.0	6.0	9.5	7.8	8.5	6.0	8.5	8.5	9.4	4.0	5.0	4.5	2.5	6.3	4.8	5.2	6.0	5.6	6.3
3	2.5	2.5	2.2	2.0	3.0	2.5	1.5	1.2	3.0	2.3	2.4	6.5	8.5	8.0	5.0	6.8	8.2	8.0	7.0	7.7	7.7	7.5	4.6	4.8	7.2	7.5	7.9	5.7	7.0	6.0	4.5	6.8
4	1.5	1.2	2.0	1.8	2.5	2.0	1.2	1.0	3.2	1.9	1.1	2.8	3.5	5.0	4.0	5.0	5.5	3.0	4.2	4.2	3.1	5.2	5.0	8.0	7.0	7.7	7.0	7.5	7.0	7.2	7.2	
5	2.0	4.5	3.8	4.0	4.5	3.5	4.0	3.5	4.2	3.8	3.1	9.0	7.0	3.5	8.0	7.0	8.5	9.0	9.0	8.3	6.0	8.0	2.0	1.2	2.0	3.3	2.1	7.0	6.0	6.5	6.1	
6	2.0	3.5	3.2	3.2	4.0	3.0	3.0	3.2	4.0	3.2	2.6	10.0	9.5	11.0	11.0	3.5	10.5	10.2	11.0	8.7	8.5	9.0	5.2	8.0	7.0	9.4	7.8	7.0	7.0	7.0	6.0	
7	1.2	1.2	2.0	1.8	2.0	1.2	0.8	1.0	1.5	1.4	1.1	8.0	10.0	10.0	10.0	9.5	10.0	9.0	9.0	9.4	8.0	10.0	8.0	8.5	8.5	10.8	8.3	6.5	7.0	6.7	5.2	
8	3.0	2.0	2.2	2.0	3.0	2.5	1.8	1.5	3.0	2.3	2.1	6.0	6.5	6.0	5.0	6.5	6.2	3.5	4.0	5.4	4.7	11.5	8.0	9.0	8.5	9.3	7.1	7.0	8.5	7.7	7.3	
9	1.4	1.5	1.2	1.5	1.5	1.2	1.5	1.0	1.5	1.2	1.2	1.5	0.5	1.2	1.2	1.2	1.5	2.0	1.3	1.7	1.7	1.2	9.0	6.5	6.5	6.6	7.7	3.8	4.5	4.2	3.5	
10	3.0	1.4	1.2	1.1	1.2	1.2	1.0	1.5	1.2	1.2	1.2	4.5	5.0	3.5	4.0	4.5	3.5	3.5	7.0	4.4	4.8	6.0	8.0	6.5	6.0	6.6	5.6	2.8	2.8	2.8	3.0	
11	8.5	6.5	7.8	8.0	8.0	10.0	5.5	8.0	7.5	7.8	5.8	5.0	5.5	6.0	5.5	6.0	6.2	6.0	6.5	5.8	4.9	2.8	3.5	4.2	5.0	3.9	4.3	3.5	4.0	3.7	3.4	
12	10.0	8.5	10.0	10.0	12.0	10.0	11.5	11.0	12.5	11.3	12.6	5.5	6.0	7.0	7.2	6.8	6.8	7.0	6.7	6.7	6.0	2.5	3.5	5.0	4.9	3.9	4.3	9.0	9.0	9.0	8.4	
13	9.0	6.5	9.0	9.0	11.0	9.0	10.0	10.0	9.0	9.2	9.4	7.5	7.5	8.2	8.0	7.5	8.2	6.0	7.5	7.6	9.2	8.0	10.0	10.5	9.0	9.6	8.9	8.6	9.0	8.7	8.2	
14	2.5	2.5	1.5	1.8	1.5	2.5	1.2	1.2	2.2	1.9	2.4	1.8	1.2	1.5	1.5	1.8	1.5	1.2	1.9	1.6	1.5	8.5	10.0	11.0	9.2	9.7	8.5	7.2	8.0	7.6	7.0	
15	1.5	3.0	1.8	2.5	2.0	3.0	2.0	1.8	3.0	2.3	2.6	3.0	2.0	2.9	2.5	4.0	3.2	4.5	4.5	3.3	3.0	10.0	9.8	10.0	9.5	9.9	12.3	8.0	8.5	8.2	6.2	
16																						10.2	10.0	10.0	9.5	10.0	10.1					
17																						9.5	9.8	10.5	9.5	9.9	9.5					
18																						9.5	10.0	10.0	9.5	9.7	8.1					
19																						10.8	9.8	11.0	9.5	10.3	11.7					
20																						11.5	10.0	11.0	9.5	10.5	9.8					
Mean	5.25	5.20	5.20	5.13	5.65	5.48	4.75	5.35	6.98	5.45	5.20	5.95	5.85	6.36	6.65	5.85	6.33	6.08	6.44	6.12	5.87	7.54	7.46	8.04	7.13	7.41	6.23	6.55	6.93	6.05		
Index	0.24	0.23	0.28	0.22	0.15	0.18	0.21	0.28	0.29	0.16	0.11	0.11	0.20	0.21	0.25	0.25	0.26	0.30	0.21	0.21	0.16	0.20	0.24	0.18	0.18	0.14	0.19	0.16				

Table (23) continued on page 2 of 2

Districts	Geographical Cal area in thousand acres	Number of River Stations		Utilizable water in thousand acres			Current Fallow in thousand acres			Total in thousand acres		
		A	B	A	B	C	A	B	C	A	B	Columned
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Abhergaon	25 68	21	16	72	49	60	76	82	79	148	131	139
Bankura	16 94	5	5	202	34	118	182	444	323	384	478	431
Birbhum	11 16	5	5	106	74	90	56	42	49	162	116	139
Bogra	9 44	4	4	123	80	182	22	26	24	145	106	125
Burdwan	17 31	5	5	179	156	168	113	100	106	292	256	274
Dacca	17 53	6	6	295	348	322	122	160	141	417	508	463
Dunapur	25 56	7	7	363	369	366	212	208	210	575	577	576
Faridpur	15 05	15	9	205	239	322	26	27	26	231	266	249
Hooghly	7 70	5	4	66	112	89	45	62	54	111	174	143
Kourah	3 42	2	2	4	5	4	13	5	9	17	10	13
Jalpaiguri	18 47	5	5	154	229	192	337	392	364	491	621	556
Jessore	18 71	16	11	401	308	354	98	128	113	499	436	468
Khulna	15 92	15	11	116	116	116	106	30	68	222	146	184
Maldah	12 75	5	5	150	135	142	33	76	54	183	211	197
Midnapur	33 95	9	9	388	600	494	287	422	354	675	1022	848
Murshidabad	13 07	11	5	340	371	356	74	120	97	414	491	453
Nymensingh	39 63	12	12	906	591	748	241	439	340	1147	1030	1088
Nadia	18 11	13	9	739	606	672	106	155	130	845	761	803
Noakhali	8 94	4	4	40	20	30	19	31	25	69	51	55
Palna	11 64	6	6	112	161	106	129	118	124	241	219	230
Rajshahi	16 11	6	6	111	110	110	63	126	94	174	236	205
Rangpur	23 08	8	8	252	288	270	138	196	167	390	484	437
Tripura	16 08	6	6	117	263	190	11	54	32	128	317	223
24 Parganas	22 76	8	8	193	213	203	105	193	149	298	406	352
Chittagong	16 45	3	-	67	(67)	67	115	115	115	182	182	182
Total	4 35 46	202	168	5701	5484	5592	27293	3751	3240	8430	9235	8633

Table (2a). Official estimate : Land lying fallow and cultivable waste.

Name of districts	Settlement Records,					Area & Yield of principal crops 1927 - 28,				
	Year of Settlement Survey	Cultivable area other than current fallows in thousand acres	Area not available for cultivation in thousand acres.	Current fallows in thousand acres.	Total in thousand acres.	Cultivable waste other than fallows in thousand acres.	Net available for cultivation in thousand acres.	Current fallows in thousand acres.	Total in thousand acres.	
1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
Bankura	1927 - 1924	511	514	72	897	179	513	548	1038	
Birbhum	1924 - 1922	141	135	24	350	118	252	51	421	
Bogra	1923 - 1929	49	78	8	155	108	129	100	528	
Burdwan	1927 - 1924	153	233	24	360	242	412	474	1158	
Dacca	1913 - 1917	101	337	9	447	22	184	44	250	
Dinajpur	1924 - 1920	124	229	93	466	267	509	551	1318	
Faridpur	1924 - 1914	106	186	14	306	-	65	-	65	
Howrah	1924 - 1929	24	64	9	97	91	65	78	229	
Jalpaiguri	1926 - 1916	329	189	84	593	226	180	265	771	
Jessore	1926 - 1924	151	219	59	449	212	549	366	1127	
Mulna	1920 - 1926	192	249	98	449	441	340	9	690	
Nalanch	1922 - 1925	27	75	5	107	514	142	265	619	
Najibpur	1911 - 1917	620	57	89	1242	834	516	144	1494	
Nurshahi	1921 - 1922	157	169	59	387	99	225	126	462	
Nyasaingh	1923 - 1913	358	262	84	1324	286	1156	37	1609	
Nadia,	1912 - 1926	221	198	129	548	244	414	76	736	
Noakhali	1926 - 1929	74	222	4	300	46	168	17	251	
Panna	1912 - 1926	63	192	51	292	25	159	95	229	
Rajshahi	1921 - 1928	166	229	29	415	165	265	261	681	
Rangpur	1915 - 1913	246	391	66	705	3	392	175	484	
Tipperah	1924 - 1915	46	272	5	325	59	459	23	523	
24 Parganna	1925 - 1923	268	401	55	622	369	375	312	1244	
Chittagong	1926 - 1920	280	589	265	934	166	228	50	444	
Total		4059	6429	1306	11785	4708	7625	5978	16531	