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STUDY OF THE
HIGH YIELDING VARIETIES PROGRAMME
IN A DISTRICT IN MAHARASHTRA
(PADDY 1966-67)

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THE HIGH YIELDING VARIETIES PROGRAMME

FOREWORD

The present study was undertaken at the instance of the Ministry of Food and Agriculture, Government of India. Development of new varieties of rice, wheat, maize, jowar and bajra which promise to produce extraordinarily high yields in comparison with the yields of traditional varieties has created a new possibility and a hope that the country may be able to solve the food problem earlier than was expected. The propagation of these varieties in the most favourable areas and supplying them with the needed chemical fertilizers constitute today the principal programme of agricultural development in the field of foodgrains. In official circles, it is known as the High-Yielding Varieties Programme or HYVP, for short. The present study is an investigation into the implementation and operation of this programme in a rice-growing district in Maharashtra.

A point of major interest is the mechanics of fixing of targets and of reporting the achievements. It will be seen that the targets fixed bear little relation to the physical realities and therefore in spite of several revisions of targets, the achievement falls very much short of the targets. Of greater concern is the manner in which achievements are reported. The basis of estimating the achievements is the quantity of improved seed supplied or distributed and a certain standard recommended seed rate. The district authorities base their reported achievements on the quantities of seed distributed. The Department of Agriculture, in turn, reports its achievements on the basis of quantity of seed supplied to the district. In consequence the achievement reported by the Department of Agriculture is very much in excess of the achievement reported by the district. However, even the achievement reported by the district is very much in excess of the fact. When all factors are combined it seems that the actual achievement was only one-third of the achievement reported by the Department of Agriculture. This may be regarded inevitable in a programme where excessive concentration of efforts is made and the programme is being pushed with very high expectations. It is to be hoped, however, that, in due course, more realistic targets will be fixed and the reported achievements will be closer to the facts.

As this report is in the nature of a case study we thought it advisable not to disclose the identity of the district. It is believed that the study illustrates a phenomenon which is widely prevalent and is not necessarily confined to the particular district under report. It is hoped that the study will be found useful in improving the implementation and operation of agricultural development programmes generally and that no one concerned will regard it as unfair criticism.

Gokhale Institute of
Politics and Economics,
Poona 4.

V. M. Dandekar

Director

Dated 8th July, 1968.

PREFACE

The present study was conducted in the Agro-Economic Research Unit of the Gokhale Institute of Politics and Economics, Poona, for the Technical Committee of the Ministry of Food and Agriculture on the Study of the High Yielding Varieties Programme in the country. Its objectives were the examination, in depth, of the planning and implementation of the programme at the district, block and village levels and of the role of agricultural credit in the implementation of this programme. The study was restricted to a single crop, viz. paddy, and to a single district accounting for nearly one eighth of the area brought under the high-yielding varieties in the entire Maharashtra State.

The variety of paddy, viz., Taichung Native-1, had given good results on the experimental farms. The State had issued all the necessary directives in the implementation of the programme. The Institutional mechanism needed for the extension of the programme appeared to be fairly well-conceived at the state level. However, the implementation at the ground level in the district as well as the task of setting up of the target left many things to be desired. It is left to the readers of this report to note what happened in the actual implementation of the programme at the ground level and to the response of the variety on the cultivators' fields in that particular year even after it had been tested earlier in the same district.

Though naturally the identity of the selected district was not held back in the original report submitted to the Technical Committee, it was thought undesirable to do so, for obvious reasons, in this published report. The author is grateful to all the concerned officials in the selected district, who spared no pains in making available to him all the material that was needed for these investigations.

- S. W. Muranjan

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CHAPTER 1

INTRODUCTION

Introduction of the high yielding varieties in place of the local and the other improved ones, has attained considerable importance as a strategy for increasing the agricultural production in the country. Moreover as envisaged in the Fourth Five Year Plan itself, nearly two-thirds of the increase in food-grains production is to be achieved through growing the high yielding varieties alone.

High yielding varieties have been evolved in respect of rice, wheat, maize, jowar and bajra and they are already under trial on both the experimental farms and on cultivator's fields, under varying soil and climatic conditions since the last 2-3 years. The efforts made so far were essentially experimental in nature. It is only in the year 1966-67 that a somewhat massive programme had been launched to give these varieties a fair trial on the cultivators' holdings on a large scale. In the Maharashtra State, for example, the target was to cover 7.62 lakh acres under these varieties during the year 1966-67.

One of the main characteristics of these high yielding varieties is their response to very heavy doses of fertilizers and subsequently to the other inputs. It is, therefore, imperative that a programme of high yielding varieties should synchronise with a programme of higher credit disbursements to the cultivators to enable them to use the most responsive doses of fertilizers and the other inputs and derive the full benefits from these varieties. The All India Rural Credit Review Committee of the Reserve Bank of India, therefore, desired that the various Agro-Economic Research Centres may help in the work of the Committee by carrying out a quick study of the High Yielding Varieties Programme launched during the year 1966-67 in the selected districts in the country, to enable the committee to assess the credit requirements for these programmes. It is with this object in mind that an attempt has been made in the present study to assess and evaluate the programme in one of the districts of Maharashtra State with special emphasis on the role of the agricultural credit and the problems pertaining thereto in relation to the high yielding varieties programme.

The objectives of the study as indicated in a Note circulated for the second meeting of the Rural Credit Review Committee were to assess -

- (a) The response of farmers to the Programme and factors having a bearing on such response.
- (b) The extent of the resulting demand for credit and inputs and how such demand was met.
- (c) Role of institutions, such as the Co-operatives and Government in providing the services required in the context of the programme e.g. extension, demonstration, supply, credit etc., and
- (d) The extent of co-ordination among different agencies participating in the programme.

Though the primary emphasis was on the study of the role of agricultural credit in the High Yielding Varieties Programme, the study was planned so as to throw light also

on the working of the programme at the district, block and village levels.

Outline of the High Yielding Varieties Programme

The main contents of the High Yielding Varieties Programme 1/ as envisaged by the Central Ministry of Food and Agriculture were as given below.

1. Selection of suitable areas within the district and its phasing over the five year period.
2. Completion of preparatory arrangements such as placing full complement of staff in position and their training.
3. Production of certified seeds through National Seed Corporation, State Seed Corporations, State Seed Farms and the net work of registered growers.
4. Making suitable arrangements for supplying treated seeds to cultivators or ensuring such treatment before they are sown.
5. Organization of timely supplies of seeds to cultivators willing to take up this programme either through existing supply points or by way of opening new depots.
6. Ensuring the application of recommended quantity of fertilizers in order to achieve the main objective of increasing per acre crop yields.
7. Making adequate arrangements for the timely supply of plant protection equipment and pesticides.
8. Making suitable arrangements for supplying seed, fertilizer etc. on credit.
9. Ensuring systematic follow up of the programme at the level of the cultivator and the village so as to facilitate assessment of the performance and extending the area under these varieties.
10. Provision of adequate marketing facilities and price support.

The High Yielding Varieties Programme in Maharashtra State

The High Yielding Varieties Programme in Maharashtra State envisaged a coverage of an area of 5.82 lakh acres under the high yielding varieties in the kharif season and 1.80 lakh acres in the rabi season. The high yielding varieties which were to be introduced under the programme were paddy Taichung Native-1, Sonora wheat and the hybrid varieties of jowar, bajra and maize. The targets fixed for these varieties in the kharif and the rabi seasons and the areas covered 2/ under

1 Note circulated by the Programme Evaluation Organization (Planning Commission) - Evaluation Study on the Implementation of the High Yielding Varieties Programme.

2 The term "area covered" has been used throughout the discussion in the context in which it has been used by the Department of Agriculture. The Department of Agriculture has used the term to indicate the area for which seeds were made available. These areas are likely to be different from the areas actually brought under the variety as will be seen later.

these varieties in Maharashtra State have been noted in Table 1. The latest available figures for the areas under the respective crops in the State have been also noted in the same table to indicate the extent of the coverage under these varieties in relation to the total areas under the respective crops.

Table 1: THE TARGETS AND THE AREAS COVERED UNDER THE HIGH YIELDING VARIETIES OF THE DIFFERENT CROPS IN MAHARASHTRA STATE.

(Figures in lakh acres)

Crop	High yielding variety	Area* under the crop	Target for the high yielding variety	Target for the high yielding variety as a percentage to the area under the crop	Area covered under the high yielding variety	Area covered as a percentage to the target area
Paddy	Taichung Native-1	33.37	1.95	5.8	1.70	87.2
Jowar (Kharif)	Hybrid Jowar	62.01	1.20	1.9	0.27	22.5
Bajra	Hybrid Bajra	42.13	1.17	2.8	0.27	23.1
Maize (Kharif)	Hybrid Maize	00.70	1.50	285.7	0.81	54.0
Maize (rabi)	"		0.50		N.A.	-
Jowar (rabi)	Hybrid Jowar	90.03	1.00	1.1	N.A.	-
Wheat	Sonora	21.95	0.30	1.4	N.A.	-

N.A. : Figures were not available at the time of this inquiry which was conducted in December 1966.

Figures pertain to the year 1963-64.

Except for maize, in the case of all the other crops the targets for the high yielding varieties ranged from 1.9 per cent in the case of hybrid jowar to 5.8 per cent in the case of paddy. In case of maize, however, the target was placed at nearly three times the area under the crop in 1963-64. This was done with a view to introduce the high yielding variety of maize as a new crop in the State and in place of sugarcane displaced by the reduction in the canal water for the crop to encourage the cultivation of food crops.

The figures for the areas covered through these targets would indicate that an area of 1.70 lakh acres could be

covered under paddy TN-1 whereas there were considerable short falls in respect of the varieties of the other crops. These figures under area covered, as we were told, were, however, based only upon the seed made available for these crops by the Department of Agriculture at the State to the Agricultural Departments at the districts. The area over which the crops were actually grown were not available. The table would further indicate that an area of 0.81 lakh acres could be covered under maize even though the target was 1.50 lakh acres whereas for each of the jowar and bajra crops, the area covered was 0.27 lakh acres as against the targets of 1.20 and 1.17 lakh acres respectively. In terms of percentages, these achievements worked out to 87.2 and 54.0 per cents in case of paddy and maize whereas to only 22.5 and 23.1 per cents in case of jowar and bajra respectively.

These shortfalls in the targets were mainly due to the failures in the seed multiplication programmes for jowar, bajra and maize undertaken during the earlier summer. There was no shortage with the paddy seeds as they were procured from Andhra Pradesh. The figures for the seed multiplication programmes are given in a table below.

Table 2: AREAS UNDER THE SEED MULTIPLICATION PROGRAMMES FOR JOWAR, BAJRA AND MAIZE DURING THE SUMMER SEASON OF 1966.

Crop	Area planned	Area planted	Area failed	Area fully or partially successful
Maize	1950	1526	355	1171
Jowar	3155	1352	544	808
Bajra	1000	440	149	291

There was a delay in receiving the foundation seeds for the above crops and sowing had, therefore, to be continued till the middle of March 1966. This resulted in the reduction of the areas to be planted for these crops. The crops also failed after planting over certain areas due to various reasons such as shortage of water, sudden rise in the temperatures in April leading to failure of synchronization of the two parents etc. Consequently, hybrid seed production fell far short of the expectations. While maize was somewhat successful, bajra succeeded only partially and jowar failed over large areas. This short supply of seeds adversely affected the programme of cultivation of hybrid crops in the kharif season of 1966.

The same would have been the case even with the rabi crops. The original target for growing hybrid jowar in the rabi season was fixed at 6.1 lakh acres and that for maize and wheat at 3.50 and 1.00 lakh acres respectively. But bulk of the jowar foundation seed was received late in June from the U.S.A. and sowings had also to be delayed considerably because of delayed monsoon in the whole of the State. It would not have been, therefore, possible to supply seeds for such a large programme. The target for hybrid jowar, had therefore to be cut down from 6.1 to 1.00 lakh acres and that for maize from 3.5 to 0.50 lakh acres as noted in the table. The target for wheat was also reduced to 0.30 lakh acres. The areas covered under the rabi programme were not available when this inquiry was conducted.

Targets and achievements for paddy TN-1 in the different districts

As the programme had shown a good success in case of paddy TN-1, figures for targets and achievements under this crop in different districts were collected. They are given in Table 3 together with the areas under paddy in the respective districts. The districts have been merely indicated by serial numbers in the table to avoid the identity of the selected district.

Table 3: THE TARGETS AND THE AREAS COVERED UNDER TAICHUNG NATIVE-1 IN THE DIFFERENT DISTRICTS IN MAHARASHTRA

S. No.	Area under paddy	P A D D Y	
		Paddy-Taichung Native-1	
		Target	Area covered
1.	669,600	22,000	18,700
2.	531,100	25,000	29,000
3.	369,600	25,000	25,000
4.	333,300	45,000	39,000
5.	325,500	41,000	21,000
6.	267,200	10,000	4,000
7.	131,600	5,000	6,700
8.	94,800	6,000	7,600
9.	76,700	400	300
10.	71,600	2,000	2,000
11.	69,400	800	2,500
12.	64,500	500	1,000
13.	60,700	8,000	3,200
14.	44,300	300	300
15.	36,500	500	2,300
16.	28,300	300	300
17.	26,900	500	2,100
18.	24,900	200	1,600
19.	23,700	200	600
20.	20,400	300	300
21.	18,000	500	1,000
22.	14,500	300	300
23.	8,800	600	500
24.	8,400	400	400
25.	8,300	200	300
TOTAL:	3337,900	195,000	170,000

(NOTE: The figures for the areas under paddy relate to the year 1963-64.

Source: Department of Agriculture, Maharashtra State).

The table indicates that the high yielding variety of paddy was to be grown in each and every district in the State. The targets, however, varied from a mere figure of 200 acres in some districts to as high as 45000 acres in those districts in which paddy cultivation was largely concentrated. The figures for the areas under paddy and the targets, however, would indicate that these figures were not correlated anyway. In districts, 1 and 2, for example, the areas under paddy exceeded 5 lakh acres, as against the target of about 22 thousand acres, but in districts 4 and 5, the areas were about 3 lakh acres as against the target areas varying between 40 and 45 thousand acres. Though there was a target for the variety in each district, the target areas for districts 1 to 5 made up the bulk of the target area - 1.58 lakh acres out of the total target area of 1.95 lakh acres.

The figures for the areas covered under the variety indicate that the targets were completely achieved in some districts whereas they were even surpassed in some of the districts having lower acreage - targets. The largest area-coverage, viz., 39000 acres, was, however, for the district No. 4 which had also the largest target acreage of 45000 acres under the variety. This district was, therefore, selected for the present survey.

Selection of the villages for the survey

It was decided to conduct a detailed survey in the selected district by selecting two blocks and two villages from each block where the performance of the programme was considered to be the "best". The Agricultural Department of the Zilla Parishad in this district was, therefore, approached to suggest the two "best" blocks and two "best" villages in each block and the detailed survey was, therefore, restricted only to these suggested blocks and villages.

While the survey was being carried out in these villages, it was observed that the cultivators in one of the villages were reporting unduly low yields and very heavy expenditure on cultivation to prove that they had incurred heavy losses by participating in the programme. The cultivators in this village had received taccavi loans from the Zilla Parishad for this programme as the Cooperative Society in the village could not finance them during the year because of some dissensions and a small fraud. Their intention was to report losses through this inquiry for this village and ask for the redemption of their loans. Such a village had, therefore, to be dropped out of the list of selected villages and it had to be substituted by another village.

All the families in these four villages were listed and the families in each village were divided into two groups according to whether they had participated in the programme or not. The families in each group were then arranged in a descending order according to the size of the holdings in case of the non-participating families and according to the area under the high yielding variety in case of the participating families. Each group was then divided into five equal sub-groups. Three of the families were selected at random from each subgroup from the group of families participating in the programme and two from each subgroup from the group of families not participating in the programme. The objective was, thus, to select 15 participating and 10 non-participating families from each village. This procedure was, however, possible only in the case of the participants in all the four villages and the non-participants in three villages as the number of non-participants in the fourth village was only 8. All these non-participants in this village were, therefore, selected for the

survey and the balance of 2 non-participants was made good through selecting 12 instead of 10 non-participants from another selected village which contained the largest number of non-participants among the four villages. The non-participants in the latter village had for the purpose to be divided into six equal subgroups for the selection of two non-participants from each subgroup. The survey, thus, covered 60 participating and 40 non-participating families from the four selected villages.

A participant cultivator for the purpose of this inquiry was the one who had sown the seeds of the high yielding variety whereas the non-participant was the one who possessed some paddy land and had not sown the variety. A few cultivators had obtained the seed of the high yielding variety free, but had not attempted to sow it as would be seen later. They were considered non-participant cultivators though they were provided with the seed for the programme. On the contrary, there were a few cultivators who had not obtained the seed through the regular channels of the cooperative society or the Agricultural Department but had sown the high yielding variety by obtaining seed through their relatives. They were, therefore, considered as the participants for the purpose of this inquiry. Those who had sown the high yielding variety were thus considered as the participants whereas the others who held some paddy land but had not sown the high yielding variety were considered as the non-participants for the selection of the participants and the non-participants for this inquiry.

A schedule was designed for the participating and the non-participating families to elicit information required for the major objective of this inquiry pertaining to the credit requirements of the high yielding varieties programme. In addition, a number of case studies were conducted in each village to get details about the response of the farmers and the problems in the organization and implementation, of the programme in the selected villages. Data were also collected at the block and district levels to get a clear idea about the organization and implementation of the programme at those levels.

The inquiry in the villages covered a period of about 22 days from the 5th to the 26th December 1966. The collection of data at the Block, District and State levels took some time and it continued up to the 20th of January 1967.

How the programme was organized and implemented in the district and the selected blocks, has been discussed in Chapter 2; all the major features of the implementation of the programme at the village level have been brought out in Chapter 3 whereas the relevant data for the assessment of the credit requirements of the programme have been presented in Chapter 4. An attempt has been made in Chapter 5 to summarize the observations and draw conclusions from these investigations.

The Special Kharif Crop Campaign in Maharashtra State

Since the Special Kharif Crop Campaign, a plan scheme, was very intimately connected with the implementation of the High Yielding Varieties Programme in Maharashtra State, it is necessary to note here what this scheme is. The scheme was being implemented since 1964-65 as a district-level plan-scheme and its objective ^{1/} was to attract the farmers towards the

1 Leaflet No. 247 of the Department of Agriculture, Maharashtra State.

improved methods of cultivation for the food crops. In the year 1965-66, greater emphasis was laid in this scheme on the adoption of improved practices but in the year 1966-67 the scheme was oriented mainly towards the cultivation of the high yielding varieties. The targets under this scheme were the same as discussed earlier except that one lakh acres were to be cultivated under ragi by the improved methods in addition to the earlier targets for paddy, jowar, bajra and maize. The total financial provision for this scheme was Rs. 135.30 lakhs. 1/ This expenditure was to be incurred for raising of paddy nurseries, treatment of paddy and kharif jowar seeds, free supply of paddy seed in the non-paddy areas, free supply of fertilizers for ragi, free supply of fertilizers for kharif jowar, supply of fertilizers to small paddy growers and subsidy on fertilizer mixtures. The relevant details of this scheme are as noted below.

1. Preparation of nurseries for Paddy TN-1:

The objective under this item was to prepare nurseries of paddy TN-1 over 10,000 acres through the Gram-panchayats by giving a subsidy of Rs. 200 per acre to meet the cost of preparing such nurseries. The cost was estimated to be Rs.275 per acre as given below.

	Estimated cost	Subsidy
1 Seeds, 100 kgs.	115.00	110.00
2 Fertilizers and compost	140.00	70.00
3 Pesticides	20.00	20.00
Total:	<u>275.00</u>	<u>200.00</u>

The finance provided for the nurseries was Rs. 20 lakhs and it was estimated that the seedlings grown over these nurseries would be sufficient to grow TN-1 paddy over 1 lakh acres out of a total target of 1.95 lakh acres under the variety.

2. Preparation of nurseries for other improved paddy varieties:

Since it was not possible to grow TN-1 over the entire paddy area, provision was made for preparing nurseries of the other paddy varieties over 5000 acres. The Grampanchayats were to be given a subsidy of Rs. 120 as against an estimated cost of Rs. 200 per acre for this purpose as shown below.

	Estimated cost	Subsidy
1 Seeds, 100 kgs.	-	60.00
2 Fertilizers and compost	200.00	40.00
3 Pesticides	-	20.00
Total:	<u>200.00</u>	<u>120.00</u>

The finance provided for these nurseries was Rs. 6 lakhs.

3. Cultivation of paddy in the non-paddy areas:

The objective of this part of the scheme was to encourage cultivators in the non-paddy areas to grow paddy to overcome the scarcity of rice in the State. The seeds of paddy were to be provided free for the purpose. The finance provided for the purpose was Rs. 1.30 lakhs for distributing seeds over 10,000 acres.

4. Provision of subsidy for manure mixture:

The objective of supplying manure mixtures was to provide balanced nutrition for the plants. To achieve this objective a subsidy at the rate of Rs. 50 per ton was to be granted for manure mixtures used for paddy TN-1, hybrid jowar, hybrid bajra, hybrid maize and paddy grown in the non-paddy areas. The financial provision made for the purpose was Rs. 50 lakhs.

5. Supply of fertilizers to small paddy growers:

Since it becomes very difficult for the small farmers to use fertilizers for paddy, the objective of this part of the scheme was to grant a subsidy of Rs. 11 per acre to the small paddy farmers having a holding of two acres or below, for the use of fertilizers. The subsidy was to be granted only to those farmers who would use at least 50 kgs. of ammonium sulphate and 60 kgs. of super phosphate per acre. The finance provided for this subsidy was Rs. 22 lakhs.

6. Free distribution of fertilizers for ragi:

Since ragi is a crop of the poor farmers, this part of the scheme had made a provision of Rs. 25 lakhs for supplying fertilizers free for ragi cultivation at the rate of Rs. 25 worth of fertilizers per acre.

7. Free distribution of fertilizers for hybrid jowar in the scheduled tribe areas:

An amount of Rs. 10 lakhs was provided at the rate of Rs. 100 per acre for supplying fertilizers free of cost for growing hybrid jowar in the areas inhabited by the scheduled tribes.

8. Seed treatment

An amount of Rs. 1 lakh was provided for treating the seeds of paddy and jowar over 11 and 25 lakh acres at the rate of 10 and 4 paise per acre respectively.

These eight steps were expected to boost up the food-grains production in the State. Though the financial provision for these steps was Rs. 135.30 lakhs as mentioned earlier, the total finance granted for this scheme upto October 1966, came to Rs. 115.58 lakhs. 1/

Characteristics of the paddy TN-1 variety

Before proceeding to discuss the survey data, it is necessary to note the characteristics of the TN-1 variety which is the subject matter of this study. The characteristics and the cultural requirements of this variety as were given in a leaflet of the Agricultural Department 2/ are as noted below.

1 Letter No. KCC/1666/7-3/G-1, dated 28th October 1966, from the Director of Agriculture, Maharashtra State to the Chief Executive Officers of the Zilla Parishads in the State.

2 Leaflet No. 242 of March 1966 of the Department of Agriculture, Maharashtra State.

The variety had been tried at some of the experimental farms in the State and it was observed that the average yields on these farms varied between 2030 and 2101 kgs. per acre.

The major characteristics of this variety as were observed at the above experimental farms are as given below.

A. Merits:

1. It is a very dwarf variety having a height of 0.75 meter only when compared to the height of 1.25 to 1.50 metres in case of the local varieties.
2. The variety is not prone to lodging even at a rate of nitrogen supply as high as 60 kgs. of nitrogen per acre. The local varieties, on the contrary, easily lodge at a dose of 20 kgs. of nitrogen per acre.
3. It gives a very high response to application of fertilizers.
4. The leaves stand erect and grow vigourously.
5. Most of the tillers throw out ear-heads.
6. The ear-heads get full of grains which are heavy.
7. It is partially immune to the blast disease.
8. Though the grains are rough they have a white attractive colour.
9. After dehusking, the grains bear a proportion of 77 per cent to the original weight of paddy.
10. The grains contain much low moisture when compared to the other varieties.

B. Demerits:

1. The variety is susceptible to bacterial blight, gall fly and stem borer.
2. It becomes difficult to thresh the produce by the usual methods.
3. Though it was observed that the variety gave 25 to 50 per cent more yield than the local varieties at 60 kgs. of nitrogen, 40 kgs. of phosphoric acid and 30 kgs. of potash per acre, it did not yield more than the local varieties when the dose of nitrogen was reduced to 20 kgs. per acre.

Recommended cultural practices

The cultural practices recommended in the same leaflet ^{1/} noted above are as given below.

1. Seed treatment - The seed should be treated with 1 per cent mercury compound at the rate of 15 gms. per 5 kgs. of seed.

2. Preparing nurseries - The seed beds should be 9.9 meter in length and 1.2 meter in breadth as in the case of the Japanese method of paddy cultivation. For each guntha of the nursery 2 kgs. of ammonium sulphate should be used before sowing and 2 kgs. again after 15 days after sowing.
3. Transplantation - The seedlings should be uprooted lightly and the tops should be pruned. Three to four seedlings should be planted per hole at a distance of 22.5 cms. x 15 cms. or 25 cms. x 15 cms.
4. Use of fertilizers - Nine tons of compost or 2.5 tons of green manure should be added to the soil at the time of puddling. Then 25 kgs. of nitrogen (i.e. 125 kgs. of ammonium sulphate), 15 kgs. of phosphoric acid (i.e. 100 kgs. of superphosphate) and 15 kgs. of potash (i.e. 30 kgs. of potassium sulphate) should be added per acre at the time of transplanting. Again 15 kgs. of nitrogen (i.e. 75 kgs. of ammonium sulphate) should be used as top dressing after 4 to 5 weeks after transplanting.
5. Interculturing - The crop should be hoed twice, once after two weeks after transplanting and again after five weeks after transplanting.
6. Protection against pests and diseases - Clean cultivation, seed treatment and spraying the crop thrice are needed for controlling the blight, gall fly and the stem borers. The first spraying should be done two weeks after transplanting and it should be repeated again twice at intervals of two weeks. For preparing the spray, 20 ml. of 20 per cent endrine and 60 gms. of 50 per cent copper compound should be mixed with 20 litres of water.
7. Irrigation - After 15 days after the transplanting, there should be 4-5 cms. of water in the fields. The water should, however, be drained off after 25 days after transplanting and then after 30 days after transplanting 7-8 cms. of water should be kept in the fields till the maturity of the grains.
8. Harvesting - The crop should be harvested after 90 per cent of the ear-heads are matured.
9. Threshing - Since the grains of this variety do not come out easily, the crop may be threshed with the help of bullocks or threshing machines.
10. It takes about 4 months for the crop to be ready for harvest when cultivated during the kharif season and 4½ months when cultivated during the summer.

Executive functions assigned to the different officers for the implementation of the programme

The executive functions assigned to the different officers for the implementation of the High Yielding Varieties Programme as were given in a leaflet 1/ were as under.

1. Director of Agriculture:
 1. Provision of finance for the programme and
 2. Advice regarding the technique of cultivation.

2. Superintending Agricultural Officer:
 1. Supply of seeds to the Zilla Parishad from the taluka seed farms and
 2. Making the finance available to the district.
3. Chief Executive Officer of the Zilla Parishad:
 1. Complete responsibility for the implementation of the programme,
 2. Preparation of estimates for the seeds, fertilizers and pesticides and arrangements for their supplies to the rural areas prior to the monsoon and
 3. Securing the finance from the Superintending Agricultural Officer.
4. District Agricultural Officer, Campaign Officer and Agricultural Officers:
 1. Preparing time schedule for the implementation of the programme, and
 2. Distribution of seeds, fertilizers, pesticides and appliances to the Gram-panchayats and farmers in time.
5. Block Development Officer:
 1. Preparation of the block - nurseries and getting the village - nurseries prepared by the Gram-panchayats through the help of the Agricultural Assistants.
 2. Arranging for the distribution of seeds, fertilizers and pesticides to the farmers in time, and
 3. Organizing crop protection squads in every village and getting their help in spraying.
6. Grampanchayats and Farmers' Unions:
 1. Selecting farmers for preparing the Grampanchayat nursery at least over one acre and getting all the tillage done for the nursery.
 2. Supplying seeds, fertilizers and pesticides to the farmers selected for the nursery.
 3. Preparation of the list of the farmers who would be prepared to purchase the seedlings from the nursery.
 4. Organizing crop protection squads.
 5. Employing a watchman for crop protection against stray cattle.
7. Gram Sevaks and Agricultural Assistants:
 1. Assisting the Grampanchayat in the preparation of the nursery.
 2. Preparing a list of the farmers who were supplied with the seedlings from the nursery and intimating the Block Development Officer about the productivity from these seedlings.

3. Preparing estimates for the supplies of seeds, fertilizers and pesticides required for the village and supplying the farmers with these through the Block Development Officer.
4. Helping the farmers in seed treatment and checking and ensuring with the help of the Sarpanch of the Grampanchayat that all the farmers had treated the seeds before sowing.
5. Holding demonstrations in the villages about the use of improved practices.

A time table of work ^{1/} for the high yielding varieties programme for paddy was also worked out along with the assignment of these executive functions. It was stated in the leaflet that the selection of the fields for the nursery should be done between the 20th and 25th May. The Gramsevak, Agricultural Assistant and the Agricultural Officer should also hold a meeting in the village and explain this scheme. Between 25th and 31st May, the seeds, fertilizers, pesticides etc. should be stocked in the villages. The other details in this leaflet pertain to the technique of cultivation. It was also mentioned in the leaflet that the paddy seedlings grown on the nurseries through the agency of the Grampanchayat should be sold at Rs. 15 per guntha to the farmers, or in other words for Rs. 600 per acre. It was noted earlier that the cost over seeds, compost, fertilizers and pesticides per acre of the nursery was estimated at Rs. 275 per acre for which a subsidy of Rs. 200 was to be granted. This meant that the Grampanchayats would have to incur a cost of only Rs. 75 per acre over materials and the balance of Rs. 525 would account for the cost over labour, rent for the land and profits accruing to the Grampanchayat if any. The outcome of such a well planned nursery programme will be noted in great many details just in the ensuing two chapters.

1 Leaflet No. 248 of May 1966 of the Department of Agriculture, Maharashtra State.

CHAPTER 2

ORGANIZATION AND IMPLEMENTATION OF THE PROGRAMME IN THE SELECTED DISTRICT AND BLOCKS

Section I - THE DISTRICT

The district

The selected district has an area of 2,712.3 sq. miles and a population of 10.59 lakhs according to the 1961 census. The density of population in the district is 390 persons per sq. mile as against the density of 334 persons per square mile for the State.

The number of inhabited villages in the district is 1,778. The villages in the area are, however, fairly small and on an average a village has a population of 536 persons only as against an average of about 800 persons for the State.

Though the rainfall is quite heavy it is not uniform in all the parts of the district. It increases considerably as one goes from the west to the east. The western zone gets on an average 215 cms. of rainfall; the central zone gets 300 cms. whereas the eastern zone gets 391 cms. The bulk of the rain is received from June to September. The rainfall reliability in this district is slightly high. ^{1/} The heavy rainfall, high rainfall reliability, smaller size of the villages from the point of the organization of programmes were, thus, factors favourable for undertaking a large scale programme for the introduction of the high yielding varieties in the district.

Out of the total geographical area of 16.97 lakh acres in the district, about 23.9 per cent is under forests. Barren and unculturable land accounts for 17.9 per cent of the area whereas the culturable waste lands account for 8.9 per cent only. The area under tree crops and groves accounts for 5.2 per cent and an area of only one per cent is under the permanent pastures. The forests, unculturable and culturable waste lands together accounting for nearly half the area, however, provide enough grazing facilities for the cattle.

The net cultivated area accounts for 5.44 lakh acres or 32.0 per cent of the total area. About 33,000 acres or 6 per cent of the net cultivated area are cropped more than once for growing a second crop of mainly beans and pulses. The facilities for irrigation are practically limited in this district and irrigated crops are raised hardly over 8,000 acres. Out of the total cropped area of 5.77 lakh acres, 3.33 lakh acres or 57.7 per cent is under paddy and 7.8 and 4.2 per cents under ragi and vari respectively. Pulses account for 5.1 per cent of the cropped area. The fodder crops in which are included mainly the grass lands of the district cover 21.8 per cent of the cropped area and they constitute the major item under the class of nonfood crops. Food crops thus, account for 77.1 per cent of the cropped area whereas the nonfood crops cover 22.9 per cent.

For administrative purposes, the district is divided into 8 talukas and 6 mahals. The areas of the Zilla Parishad and the Panchayat Samitis which were established in the year 1962, correspond to the district and the taluka or mahal boundaries respectively.

1 Being a tract of heavy and assured rainfall, the Fact-finding Committee appointed in the State in 1960 had reported that no area in this district could be considered a scarcity area.

Paddy Development Schemes Preceding the High Yielding Varieties Programme and the Agricultural Staff in the District

Since the staffing pattern for the High Yielding Varieties Programme was based on the staffing pattern for the earlier Paddy Development Schemes, it is necessary to make here a brief reference to the earlier schemes. The Paddy Pilot Scheme was introduced in this district in the year 1957-58 in one Paddy Pilot Block which covered 5 talukas. In the year 1959-60, two more blocks were started to include three more talukas from the district. These three Paddy Pilot Blocks covering eight talukas of the district, continued till the year 1961-62. Thereafter their place was taken up by the blocks for the scheme of Intensive Cultivation of Food Crops which was a district level Plan Scheme. The staff provided for the Paddy Pilot Scheme consisted of one Assistant Registrar of Co-operative Societies, one Agricultural Campaign Officer, and four Supervisors for Co-operation at the district level and one Agricultural Officer and ten Agricultural Assistants at the block level. In 1962, the staff concerned with Co-operation was transferred under the Deputy Registrar of Co-operative Societies. For the Intensive Cultivation Blocks the staffing pattern consisted of one Agricultural Officer and 10 Agricultural Assistants for each block and one Agricultural Campaign Officer and one Co-operative Officer at the district level for all the blocks. In 1963-64, 6 more talukas were taken up under the scheme to cover the entire district, except one taluka, and the whole area was reorganized into 8 Intensive Cultivation Blocks. In 1964-65 again, there was reorganization of the area into 10 Intensive Cultivation Blocks which were continued till the year of the survey. The High Yielding Varieties programme was undertaken in all these blocks and the staffing pattern for this programme was therefore, the same as that for the Intensive Cultivation Blocks. In addition to the normal staff there were, thus, 10 Agricultural Officers and 100 Agricultural Assistants, at the block level and one Agricultural Campaign Officer, and one Co-operative Officer at the district level to implement the target of 45,000 acres under the high yielding variety in this district. Out of the total agricultural technical staff of 141 officers and assistants in the district as many as 111 officers and assistants were, thus, concerned mainly with the implementation of this target and the other targets for introducing improved methods of cultivation for other paddy varieties and ragi. The Parishad Agricultural Development Officer headed the Departments of Agriculture and Animal Husbandry and there was a District Agricultural Officer for the Department of Agriculture. The Agricultural Campaign Officer held the charge for the implementation of the High Yielding Varieties Programme. It is, however, curious to note that only the Parishad Agricultural Development Officer and the District Agricultural Officer were graduates in agriculture whereas the remaining 139 members of the technical staff including the Extension Officers at the Community Development Blocks, had completed their education in Agriculture only through the Agricultural Schools after their higher primary or secondary education in vernacular.

Agencies connected with the High Yielding Varieties Programme

Besides the Agriculture and the Cooperation Departments, the other agencies which were to participate in the programme were the District Central Cooperative Bank and the District Central Cooperative Sale and Purchase Union. The District Central Cooperative Bank was to advance adequate credits to the primary credit Cooperative Societies in the villages through its branches in the different talukas. So also the District Central Cooperative Sale and Purchase Union was to supply the

materials viz., seeds, fertilizers and pesticides to these societies through the taluka level sale and purchase unions. The jurisdiction of these two cooperative agencies covered the entire district and it was, therefore, possible for these agencies to operate through the 528 primary societies covering all but one of the villages in this district.

Fixing the target

As early as in the month of February 1966 the Agricultural Department in the district was informed about a small target of growing paddy TN-1 over 15,000 acres during the kharif season of 1966-67. The district had already undertaken a programme of growing the variety over 218 acres during the summer of the year 1965-66 with the help of irrigation. Moreover, the variety had given good results at the Research Station as well as on the well known paddy farm run with foreign collaboration, in this district. The cultivators had become conscious of this variety as they had already heard about it and some of them had even observed the variety grown at the Research Station and the Paddy Farm in their vicinity. It was, therefore, easy to achieve such a small target of 15,000 acres for the kharif season especially when some of the cultivators were to actually harvest the variety in the previous summer season. No attempts were, however, made to distribute this target over the blocks but the Agricultural Officers were informed that they may have to implement a target of about 1000 to 1500 acres under the variety in each block.

On the 8th of March 1966 when the Chief Executive Officer of the Zilla Parishad of this district attended a meeting at the Secretariat, he was, however, informed that the Government had decided to allot a target of one lakh acres under the variety during the kharif season for his district. The Parishad Agricultural Development Officer was expected to chalk out a programme for the implementation of this target so as to reach the Secretary within 10 days.

On the 15th of March 1966 a meeting of the field staff consisting of the Agricultural Officers and the Extension Officers (Agriculture) was, therefore, held at the district headquarter to consider the implementation of the target. A number of difficulties involved in the implementation of such a large target were discussed at this meeting. The note prepared after this meeting gives certain estimates about the areas under different types of paddy in the district. Out of the total area of 3.33 lakh acres under paddy in the district, 0.70 lakh acres were under the saline lands and were not, therefore, suited for growing this variety. Out of the remaining area of 2.63 lakh acres under sweet rice, 1.31 lakh acres were under the late varieties and only 1.32 lakh acres were under the early and mid-late varieties. Since the TN-1 was a mid-late variety, it was estimated that only 0.65 lakh acres would be suitable for growing this variety in the district. It was, therefore, decided that the target in the first year could be at the most only of the order of 20,000 acres. The field staff was, however, asked to be prepared for a target of one lakh acres.

There were discussions even after this meeting and finally the district officials agreed to a target of 40,000 acres. The Secretary, Ministry of Agriculture and Co-operation was informed accordingly. On the 13th April 1966, the Superintending Agricultural Officer for the division sent the break up for the targets for the districts in his division and the target for the concerned district was 40,000 acres. On the 19th April 1966 the confirmation of this target was also received from the Director of Agriculture for the State.

On the 18th April 1966, the Deputy Registrar of Co-operative Societies in the district was also informed about the target by the Registrar of Co-operative Societies for the State. The Deputy Registrar was asked to form a Committee of the concerned officials in the district to estimate the requirements of seeds, fertilizers etc. and to decide upon the organization for the programme.

Estimation of the inputs and the organization for the programme

On the 18th April 1966, the Chief Executive Officer of the Zilla Parishad called a meeting of the Officials of Zilla Parishad, Co-operative Department, and representatives of the District Central Co-operative Bank and the District Central Co-operative Sale and Purchase Union to consider the implementation of the programme in respect of distribution of seeds, fertilizers, finance, pesticides etc. On the 25th April 1966 a meeting of the officials of the Agriculture and Cooperation Departments, Extension Officers, Bank Inspectors, Supervisors of the Cooperative Unions and representatives of the Bank and Sale and Purchase Union was also held at the district head-quarter. The Block Level officials had already given thought to the target of one lakh acres as instructed earlier and hence it was now easier to decide upon the villages and the targets for the selected villages when the target came down to 40,000 acres. The Parishad Agricultural Development Officer could, therefore, submit in the meeting of the 25th itself, a list of the villages and a list of the societies through which the programme could be undertaken. It was decided that the target of 40,000 acres would be implemented through 207 of the 528 primary societies and in 721 of the 1778 villages in the district.

A number of estimations were made and decisions were taken in these two meetings: 1/ The total requirement of fertilizers was estimated at 14,000 M. Tons. But since there was already a stock of 4,500 M. Tons in the district, the additional quantity required was 10,000 M. Tons. It was, therefore, decided in the meeting of the 18th that a committee of the Parishad Agricultural Development Officer, Deputy Registrar of Co-operative Societies, Managing Director of the Bank and the Industries and Co-operation Officer of the Zilla Parishad should meet immediately the Secretary for Agriculture at the Secretariat to arrange these supplies. The committee met the Secretary and the necessary arrangements were made.

As the Zilla Parishad had undertaken a programme of growing the variety over a small area in the summer, it was possible to procure some quantity of seed locally. The total quantity of seed required was estimated to be 400 M. Tons for an area of 40,000 acres at the seed rate of 10 kgs. per acre. It was expected that it should be possible to collect half of this quantity i.e. 200 M. Tons from the locally grown produce. It was decided to procure the remaining quantity of 200 M. Tons from Andhra Pradesh.

No estimates were made for the pesticides but the pesticides which were available readily in the markets were to be stocked for the purpose. The programme of spraying was to be undertaken in blocks of 25 to 500 acres and hence it was

1 These are well brought out in a circular of the Agricultural Department of the Zilla Parishad, dated the 25th April 1966 and in a letter sent by the District Deputy Registrar of Co-operative Societies to the Registrar for the State, on the 27th April 1966.

decided to carry out spraying on a community basis through the co-operatives and the Grampanchayats.

While selecting the villages, it was suggested by the Dy. Registrar of Cooperative Societies, that villages having 'D' class or defunct societies should be omitted from the programme. Similarly efforts should be made jointly by all those concerned to recover the loans with the defaulter members.

The other decisions taken during these meetings were as given below.

1. The Agricultural Officers, Extension Officers (Agriculture and Co-operation), Bank Inspectors and Supervisors at the Block level should hold meetings of the Agricultural Assistants, Gramsevaks and the Group Secretaries of the Societies. The Agricultural Assistants and the Gramsevaks should prepare a list of farmers who are prepared to participate in the programme and prepare estimates for the seeds, fertilizers and pesticides. This work should be completed by the 3rd May 1966 and these demands for the materials should be sent to the District Sale and Purchase Union, District Agricultural Officer and the Deputy Registrar of Co-operative Societies so as to reach them by the 5th May 1966.

2. The District Sale and Purchase Union should supply these materials by the 15th May 1966.

3. The normal credit statements should reach the Bank by the 5th May 1966 and the work of sanctioning these statements by the Bank should be over by 15th May 1966 so that the materials supplied by the District Sale and Purchase Union by the 15th could reach the cultivators by the 20th May 1966.

4. The finance required per acre for paddy TN-1 should be supplied as below.

1. Cash	(a) for cultivation	Rs. 100	
	(b) for consumption		
	in September	<u>Rs. 20</u>	Rs. 120
2. Fertilizers in kind			Rs. 150
3. Pesticides in kind			Rs. 35
4. Seeds in kind			<u>Rs. 20</u>
	Total:		<u>Rs. 325</u>

The N.C. Statements should be prepared at this scale of finance.

5. In case if a farmer is not the member of the society, he should be immediately enrolled as a member upon the payment of the entrance fee only. Otherwise estimates of his requirements of materials as seeds, fertilizers and pesticides should be sent to the Block Development Officer.

6. The pesticides should not be, however, handed over to the farmers. Instead, they should be pooled and used for the purpose of collective spraying. The societies should also purchase spraying appliances and organize the labour for the purpose. A 50 per cent subsidy should be given towards the cost of spraying.

7. Cultivators should be selected very carefully for this programme. Preference should be given to those who have facilities for lifting water.

8. Committees consisting of the Extension Officers for Agriculture and Cooperation, the Bank Inspector and the Supervisor of the Sale and Purchase Union should be formed to supervise the programme at the block level. The committees should be supervised by the Agricultural Officers for the blocks. The committees should hold responsibility for achieving the target and also for the after care in respect of harvests, sales and recovery of the loans. The work of these officers should be evaluated from the targets achieved and it should be noted in the confidential reports for these personnel.

9. At the district level, the programme should be supervised by the District Agricultural Officer and the Agricultural Campaign Officer. The former official was made responsible for the programme in six of the thirteen blocks whereas the latter in the remaining seven blocks.

Dissemination of knowledge about the variety

A decision was taken in the above meeting itself to bring out a leaflet giving all necessary information about the variety to the farmers. A number of aspects in addition to those covered in the leaflet for the State noted earlier, were covered in the district and the block leaflets. It was mentioned in these leaflets that the variety should be grown in place of the mid-late variety in this district but it may be possible to grow the variety even in place of the late varieties where the soils are well drained. The land, as emphasized in these leaflets, should not be very light or ill-drained. In the district leaflet, however, mention was made only of the mid-late soils. It was also mentioned in the district leaflet that the variety yielded three times greater than the local varieties but one of the demerits of this variety was that it required fertilizers in large quantities. It was stated to be an all season variety. In view of the scarcity of nitrogenous fertilizers it was suggested through these leaflets that the cultivators should use 30 kgs. of nitrogen for this variety instead of 60 kgs. From these various leaflets, however, there appeared to be some confusion about the recommended dose of fertilizers. The leaflet issued through the State, 1/ for example, recommended a dose of 40 kgs. of nitrogen. Leaflet issued through the district 2/ recommended a dose of 60 kgs. of nitrogen and a proportionate input of phosphatic fertilizers. Leaflets issued through the Blocks, however, invariably recommended a dose of only 30 kgs. of nitrogen. It was not, however, possible to clarify this confusion. Perhaps an anticipated scarcity of fertilizers might be responsible for these variations in the recommendations.

Since the variety was being grown as a summer crop in the district the Chief Executive Officer of the Zilla Parishad issued a circular on the 16th April 1966 to all the Block Development Officers to arrange for the visits of the farmers in their blocks to the fields growing the variety in one of the blocks. It was mentioned in this circular that the trips should be arranged before the 20th of May as the harvesting

1 Leaflet No. 242 of the Department of Agriculture, Maharashtra State.

2 Leaflet No. 3 of the Department of Agriculture, Zilla Parishad of the concerned district.

would start thereafter. The Block Development Officers were advised to hire special buses for the purpose and recover the charges for the same from the Gram Panchayats deputing the farmers from their villages.

The target under the Kharif Crop Campaign

While arrangements were being made for the achievement of the above target, a revised target of growing paddy TN-1 over 45,000 acres was allotted to this district under the Kharif Crop Campaign. Half the area under the target was to be achieved through what was termed as a 'Normal Scheme' i.e. distribution of seeds, fertilizers etc. to the individuals through the societies and half through the supply of seedlings through the Gram Panchayat nurseries. The fertilizers, pesticides, and finance was to be provided to the cultivators using the nursery seedlings by the societies as under the 'Normal Scheme'. Certain marginal adjustments had, therefore, to be made in the targets fixed for the different blocks as the original target of 40,000 acres went up to 45,000 acres.

Blockwise targets and their achievements

The areas under paddy and the targets and achievements in the different blocks are given in Table 4. Here again the Blocks have been represented merely by serial numbers to cover their identity. Though the overall target was 45,000 acres, the sum of the targets distributed over the blocks came to 42,450 acres. This was due to the difficulties in adjusting the small changes in the original targets on account of the revised target under the Kharif Crop Campaign. The target for the nursery was fixed at 23,000 acres which should have been in fact 22,500 acres as informed by the State, but this gap was also a result of the frequent adjustments in the targets for the blocks. The target for the normal scheme was 19,450 acres. As the figures would indicate the targets were distributed in terms of one, two, three, four or five thousands according to roughly the size of the blocks or the area under paddy in the blocks.

The total area covered under the variety came to 26,041 acres according to the figures supplied by the District Agricultural Officer. In the earlier discussion in Chapter 1, it was noted that an area of 39,000 acres was reported to have been covered under paddy TN-1 in this district. This figure was taken from a Note prepared by the Agricultural Department at the State level for the Government of India as the district level coverages were available in that Note. The figure given by the Department at the district level is, however, quite low and this gap was due to the difference in the quantity of seed supplied by the district to the farmers. The figure given by the District Agricultural Officer was based on the quantum of seed distributed to the farmers, which was a criterion adopted by the Agricultural Assistants for reporting the areas covered. Nearly 26,000 bags of the seed were distributed in the season and as one bag was meant for one acre, the reported achievement was of the order of 26,000 acres. 1/

1 A Report "On the position of Co-operative Credit Structure in the concerned district" prepared by the Reserve Bank of India in connection with this enquiry, also quotes a figure of 25,556 acres which corroborates the figure reported by the District Agricultural Officer.

Table 4: AREAS UNDER PADDY AND THE TARGETS AND ACHIEVEMENTS UNDER PADDY TN-1 IN THE DIFFERENT BLOCKS

(Figures in acres)

Block serial number	Total area under paddy	T a r g e t			Achievement or Area covered			Per- cent of achievement
		Nur- sery	Normal Scheme	Total	Nur- sery	Normal Scheme	Total	
1	42,851	2,500	2,500	5,000	1,070	2,930	4,000	80.0
2	39,405	2,500	2,500	5,000	2,500	1,394	3,894	78.0
3	39,088	2,500	1,500	4,000	1,130	1,370	2,500	62.5
4	33,577	2,000	2,000	4,000	190	810	1,000	25.0
5	32,339	2,250	1,750	4,000	950	2,150	3,100	77.7
6	30,918	2,500	1,500	4,000	2,500	1,500	<u>4,000</u>	100.0
7	29,389	2,000	1,000	3,000	-	1,574	1,574	52.5
8	18,830	2,000	2,000	4,000	1,890	1,610	<u>3,500</u>	87.5
9	16,552	250	250	500	10	25	35	7.0
10	12,657	500	500	1,000	30	170	200	20.0
11	10,610	500	450	1,000	-	450	450	45.0
12	9,878	1,000	1,000	2,000	50	450	500	25.0
13	8,835	1,000	1,500	2,500	100	1,000	1,100	44.0
14	8,736	1,000	1,000	2,000	-	188	188	9.4
Total: 333,665		23,000	19,450	42,450	10,420	15,621	<u>26,041</u>	61.4

Out of the coverage of 26 thousand acres, 10.5 thousand acres were covered through the distribution of seedlings from the nurseries and 15.5 thousand acres under the normal scheme. When compared to the targets, the achievement was much greater under the normal scheme than under the nursery scheme even though the cost of nurseries was to be subsidized. This was, because of the total failure of the nursery scheme in nearly 8 of the 14 blocks.

If one takes into account the figures under both the schemes one would find that only 61 per cent of the target was achieved and not 86 per cent as reported in the figures at the State level. In block No. 6 the achievement was 100 per cent whereas in block No. 8 it was 87 per cent. In three other blocks, the achievement was around 80 per cent. In 4 blocks it varied from 40 to 60 per cents whereas the performance was poor in the remaining 5 blocks. Block Nos. 6 and 8 were, therefore, suggested to us by the Department for this survey.

Distribution of seeds

The total quantity of seeds received from Andhra Pradesh was 3132 quintals and that procured locally was 2650 quintals. The total quantity ready for distribution was, thus, 5782 quintals. 1/ Out of this quantity only 4287 quintals or 74.1 per cent was distributed and 1495 quintals remained in balance. Out of this balance again, 612 quintals remained with the District Sale and Purchase Union and the remaining with the Blocks and the Co-operative Societies.

The seed procured from Andhra Pradesh was packed in bags of 10 kgs. each whereas that procured locally was packed in 15 kgs. bags. One bag was thought to be sufficient for an acre and in the targets reported from below one acre had been assumed to be covered per bag of the seed distributed. The seed brought from Andhra Pradesh was received in the third week of May. The seed distribution programme, therefore, continued from the last week of May to the first week of June.

The local seed was purchased at Rs. 62.5 per quintal but because of the cost of transport from Andhra, the seed supply for the programme had to be made at Rs. 115 per quintal. This price was, however, decided at the State level.

Supply of fertilizers

The supplies of fertilizers made by the District Sale and Purchase Union in the different months have been brought out in the Table 5.

The total quantity of fertilizers supplied from April to September 1966 was 6451.29 M. Tons. All this quantity was not, however, meant for local paddy and other crops. The supplies of fertilizers were, however, somewhat delayed and the bulk of the supply was made in June and not upto the 15th of May as decided in the earlier meeting. Yet nearly 7/8th of the supplies had reached the farmers by the end of June and about 800 M. Tons were supplied after June. Manure mixtures which

1 This quantity was much in excess of the earlier estimation of 400 M. Tons arrived at in a meeting at the district level. This difference was due to firstly the upward revision of the target and secondly the expectation that the recommended seed rate of 10 kgs. per acre may not prove to be adequate for an acre. The locally procured seed was therefore, packed in 15 kgs. bags and not 10 kgs. bags as decided earlier.

for the high yielding variety only but also

Table 5: SUPPLY OF FERTILIZERS IN THE DIFFERENT MONTHS

(Figures in M. Tons)

Month (1966)	Ammonium Sulphate	Ammonium Sulphate Nitrate	Area	Mixtures (9:9:5 or 9:9:6 in grains or powder)	Total
April	72.00	-	-	-	72.00
May	1210.50	32.64	-	14.00	1257.14
June	2862.65	27.64	0.10	1516.90	4407.29
July	261.10	-	-	194.70	455.80
August	143.45	115.81	0.20	52.00	311.46
September	37.60	-	-	-	37.60
Total:	4587.30	176.09	0.30	1777.60	6541.29

were popular in certain parts of the district were, however, ready for distribution mainly in June and hence ammonium sulphate which was available in May had to be moved to all the areas in the interior, irrespective of the demand for specific fertilizers in an area.

The quantities of fertilizers supplied were completely in accordance with the demands made by the Block Development Officers. But the estimate for the total requirement of fertilizers for the district proved itself to be quite large and this resulted in a heavy balance of fertilizers lying unused with the District Sale and Purchase Union which by the end of November was about 4082 M. Tons. In view of the estimate of 14 thousand M. Tons arrived at in the meetings, the District Sale and Purchase Union could acquire about 11.5 thousand M. Tons but the societies could lift up only 6.5 M. Tons or a little more than half of the stock made by the Union. The Sale and Purchase Union was, however, mainly an agency for the supplies. The arrangements for the seeds and fertilizers were made by the State Agricultural Department whereas the Union had mainly to receive these materials and supply according to the demand from the societies.

Supply of Credit

The preparation of Normal Credit Statements for the societies for supplying finance for paddy TN-1 could be commenced from the first week of May itself. The initial progress was, however, slow but upto the 21st of May, 218 N.C. Statements for an area of 17,694 acres could be sent to the Bank. It may be recalled here that the programme was to be undertaken only through 206 societies as decided by the Parishad Agricultural Development Officer in the meetings. But by the 1st of June, the number of such statements itself went up to 306. Out of these 175 N.C. Statements moved up from the Bank Inspector to the Bank and 64 statements had been already sanctioned by the Bank. As many as 242 statements remained unsanctioned even by the 1st of June. The bank had by this time sanctioned an amount of Rs. 15.67 lakhs. The N.C. Statements included the names of even the cultivators who had not repaid their previous loans. The District Deputy Registrar of Co-operative Societies observed in his review that 4140 defaulter members had been

included in these statements and the amount outstanding with them was Rs. 12.24 lakhs. 1/

The Bank had, however, adopted a policy not to finance the defaulter members even for the high yielding varieties programme. The Bank was quite considerate in that it adopted a policy of fresh financing to those societies which had repaid at least 25 per cent of the demand in respect of their previous loans.

The total number of N.C.Statements received by the Bank remained at 306 even by the end of June as no more statements were sent to the Bank after the 1st of June. Out of these statements, the Bank sanctioned 222 statements and rejected 84 statements as the recoveries from these societies were below 25 per cent of the demand. The number of members covered by the sanctioned statements was 12,416, planning to grow paddy TN-1 over 14,360 acres only. The amount sanctioned for these members was Rs. 42.59 lakhs. This amount included Rs. 2.67 lakhs for seeds, Rs. 19.17 lakhs for fertilizers, Rs. 6.39 lakhs for pesticides and Rs. 14.36 lakhs as the cash component. The Maharashtra State Co-operative Bank also sanctioned a credit limit of Rs. 50.00 lakhs for the programme in view of these demands for the variety.

The scale of finance adopted for paddy TN-1 by the Bank was Rs. 300 per acre. Even though the Bank had agreed to finance the variety at Rs. 325 per acre according to the recommendation of the Agricultural Department and the decision in the earlier district meeting, the Bank had to adopt the scale suggested by the Reserve Bank. Though the N.C.Statements were, therefore, proposed at the scale of Rs. 325 per acre, the Bank had to sanction the loans at the scale of Rs. 300 only.

The actual loan that could be lifted up by the primary societies through all these sanctions of Rs. 42 and Rs. 50 lakhs by the District and the State Banks, however, amounted to only Rs. 4.85 lakhs. An amount of Rs. 1.19 lakhs was disbursed in the month of June, 1.86 lakhs in July and the remaining amount of Rs. 1.80 lakhs in August and September. These amounts were disbursed through 48 societies. Various factors were being said to be responsible for such an unexpected short fall.

The cultivators had already received their regular short-term loans for paddy and other crops against the N.C.Statements prepared earlier for the usual short-term loans. This had sufficed their requirements of cash and as the discussion would later indicate they were even reluctant to borrow larger amounts in cash.

The supply of fertilizers was received by the cultivators either against the N.C.Statements for the Japanese Method of Paddy Cultivation Loans or directly through the societies without the execution of bonds. Moreover, the Agricultural Assistants, as would be revealed later, were in a hurry to distribute the fertilizers with the help of the office bearers and the staff of the Societies and they were, therefore, just after distributing the seeds and fertilizers to all those who were not defaulter members. They did not care even to execute the bonds. Once the cultivators had obtained the seeds and fertilizers through such distribution and had met their normal requirements of cash as stated earlier, there was no need for

them to borrow more against the N.C. Statements specially prepared for the 'Taichung Scheme'. Moreover, if a cultivator was to execute a bond it would have meant purchasing also a share to the extent of 10 per cent of the value of the seeds and fertilizers, he had obtained. The seed and fertilizer supply, thus, being made simply as a credit sale by the society to its members, there was no further need for the additional loans.

Some other factors must have also been responsible for the short fall. It might be possible that members might not have cleared up their dues to the society by the time of borrowing these loans even though their names were included earlier in the N.C. Statements. Perhaps the Bank also might be doubtful about the success of the programme and hence might not have shown any interest in getting involved to a greater extent by taking over a recovery of the cost of seeds and fertilizers supplied by the Sale and Purchase Union, by converting this cost into a loan. ^{1/} The officials have, now started thinking of getting these bonds executed from the cultivators. There was, thus, no co-ordination between the Bank and the Sale and Purchase Union in respect of the seed and fertilizer distribution.

The cultivators who were either non-members or defaulter members were supplied with seeds and fertilizers as a taccavi loan directly by the Zilla Parishad. Such taccavi loans were, however, given only in those villages in which the societies were either defunct or were declared as defaulters. It was not possible to collect the figures for the quantum of the taccavi loans.

Supply of pesticides

As the Home Guards organization in the district agreed to undertake the work of collective spraying in some of the blocks, it was decided that the Home Guards should undertake the work of spraying in eight blocks and the Co-operative Societies or Gram-panchayats should organize spraying in the remaining blocks. The Zilla Parishad also issued a leaflet requesting all those concerned to co-operate with the Home Guards in this matter. The area assigned to the Home Guards in the 8 blocks ^{2/} was 12,000 acres. A reference to the achievements in these blocks discussed earlier would reveal that the area reported to have been brought under the variety in these 8 blocks was 23,568 acres whereas the area that could be assigned to the Home Guards for spraying came to 12,000 acres only. Yet according to the District Officials all the area under the variety in these blocks was assigned to the Home Guards for the purpose of spraying!

The variety was to be sprayed thrice at an interval of 10 days. The spraying commenced from the 2nd of August. The area of 8 Blocks was divided into certain number of zones for the purpose of spraying. The Home Guards were divided into parties of 3 each and one sprayer was supplied to each party.

1 Report on the position of Co-operative Credit Structure in the concerned district, prepared by the Reserve Bank of India refers to this as one of the factors for the short fall.

2 Block Nos. 1 to 8 in Table 4, which contained large areas under paddy and which were contiguous, were assigned to the Home Guards for spraying.

The total number of power sprayers available was 230 which meant that the area to be sprayed in a period of 10 days was 52.2 acres per sprayer. Each party of Home Guards was expected to spray about 8 to 10 acres per day and each Home Guard was to receive Rs. 3½ as an allowance per day for the purpose. The expenditure over the daily allowance for the Home Guards was to be borne by their organization as the work was undertaken mainly to train the Home Guards in public welfare activities as in the case of fire control.

The pesticides had been already stocked in the rural areas. The sprayers had been also made available to the organization through some of the sprayers arrived late. The main bottleneck was, however, the availability of petrol which had not been stocked in the villages. The supply of petrol was to be made by the Blocks. The Home Guards were not given the funds to spend for the purpose. The Home Guards, therefore, approached the Zilla Parishad with a request to hand over the amount required for petrol to them but the Accounts Officer of the Zilla Parishad refused to make available the amount directly to the Home Guards on the technical ground that the Home Guards was a non-Governmental organization. The Home Guards could not, therefore, purchase the petrol from the markets and had to carry petrol from the Block head-quarters. It was, however, neither possible for them to carry petrol through the State Transport Buses nor could they have transport of their own. At many a places, they had to remain idle for want of petrol and this resulted in smaller output per day for many of the spraying squads. There was also some resistance from the farmers at some places for getting their crops sprayed because of the flowering of this variety much earlier than the expectations. The Home Guards, therefore, completed the first spraying and a decision was taken to discontinue the work while the second spraying was going on, on account of these great many difficulties. Moreover, the work was proving to be uneconomic from the point of view of their organization as the parties could spray only 2 to 3 acres per day at some places for want of petrol. The work was, therefore, discontinued from the 25th of August.

An area of 10,000 acres was covered by the first spraying whereas the second spraying was undertaken on 5000 acres only. As against the area of 12,000 acres assigned to them, the Home-Guards claimed that for the first spraying they had covered practically all the area under the variety in these eight blocks and the area was only 10,000 acres. The Home Guards organization had to spend Rs. 32,000 on the allowances for the Home-Guards engaged in the spraying work.

The Home Guards were prepared to undertake such programme again if they were given the complete control over the programme or if the stocks of all the materials were ensured in the villages to be covered. The cultivators also seemed to be much benefited, as a number of queries had been made even thereafter by the cultivators from a few Blocks as to whether the Home Guards could again undertake spraying of their crops on a limited scale.

Early flowering

The variety did flower earlier than the expectation in many a villages in the district. Since the variety had flowered earlier even in the other districts, the news appeared in the press and there was much discussion about the success of the variety. This created a suspicion about the variety in the minds of many cultivators and they could not, therefore, attend to their crops properly. A few of the cultivators as we were told by the officials, stopped transplanting and grew the other

varieties instead, whereas a few others did not use the second dose of fertilizers or used the fertilizers in meagre quantities. The officials at the State level and in the district, therefore, toured the entire district to pacify the cultivators and to note the gravity of the problem. They, however, observed that though there was early flowering in many a cases, those who had taken proper care of the nurseries, transplanted the crop in time and used adequate doses of fertilizers, had succeeded in getting a good growth for the crop. These observations were given publicity in the press. The Chief Executive Officer also issued a circular to the Block Development Officers on the 12th of August 1966, advising them to publicise that there was nothing wrong with the crop and if the farmers were to use fertilizers for the crop again the crop would tiller and give a good harvest. The cultivators were, however, not in a mood to follow this advice and in most of the cases the crop was left to the mercy of nature. At places, however, the cultivators were reported to have been so much aggravated that some of the Agricultural Assistants and Agricultural Officers, were actually threatened and beaten for giving the cultivators wrong advice to grow the variety. This aspect of cultivation and the success of the variety will be noted in more details while discussing the implementation of the programme in the selected villages in Chapter 3.

Section 2: THE SELECTED BLOCKS

General Features

Both the selected Blocks were located on the eastern side of the district, getting the benefit of the higher rainfall when compared to the rainfall on the western side. One of these Blocks was in the north whereas the other was in the south. ^{1/} The villages in both Blocks had on an average a small size, the average population of a village in the southern Block being only 381 persons. Forests, miscellaneous trees, groves and waste lands figured conspicuously in the land use pattern in both Blocks. Depending upon their extent, the area available for cultivation was only 25 per cent in the southern Block and about 45 per cent in the northern Block. Paddy accounted for 40 and 60 per cent of the cropped areas in these Blocks. Ragi and vari were the other cereals, each of which occupied less than 3 per cent of the cropped area. Pulses were being grown on a still smaller scale usually as a double crop after the harvest of paddy in the paddy fields. Facilities for irrigation had not developed in either of these Blocks. The irrigated areas, therefore, hardly exceeded 500 acres in each Block. There were, however, a number of rivulets in both Blocks. Lately attempts are being made to utilise these water resources for growing either vegetables or a second crop of paddy in the summer.

The target

According to the staffing pattern noted earlier, two officials were posted in each Block for agriculture, one an Extension Officer (Agriculture) and the other an Agricultural Officer for the scheme of Intensive Cultivation of Food Crops. Each of these officials knew about the high yielding variety TN-1 long before a target was assigned to their Blocks. Moreover, the variety was being grown already as a summer crop in

1 Block No. 6 (in Table 4) was in the south and Block No. 8 was in the north.

the northern Block. As noted earlier, initially the Agricultural Officers were asked to implement a target of 1 to 1.5 thousand acres per block but later they were asked to raise it to as much as possible to match the target of 1 lakh acres for the district. The targets in these Blocks finally rested at 4,000 acres for each Block. The Agricultural Officers were informed about these targets in the meeting of the 25th April, 1966, held at the district head-quarter. These targets were distributed tentatively among the Agricultural Assistants and adjustments were made later to cover the entire targets for the Blocks. The Agricultural Assistants were, however, initially asked to implement the targets only through the distribution of seeds and fertilizers through the societies in accordance with the earlier programme. The target for the nursery programme was received in the last week of May. Different decisions were taken up at this stage for these two different Blocks. For the northern Block it was decided that the total target for the programme should be divided on a 50:50 basis under the two schemes. For the southern Block, however, a decision was taken that only 1500 acres should be covered through the distribution of the seeds through the societies and the remaining 2500 acres through the distribution of the seedlings under the nursery scheme. The target was not divided on a 50:50 basis in this block even though such a division was contemplated in the original state scheme but greater area under the target in the Block was shifted to the nursery scheme. This might be perhaps, due to greater difficulties in achieving the total target in this Block by asking the cultivators to grow the variety mainly through purchasing the seeds. It was now easier to achieve the target in this Block as a large part of the target was to be covered solely by distributing the seedlings free. The Agricultural Assistants were informed of this revision in the first week of June.

Organization for the target

Official committees as envisaged in the district meeting were not set up in any of these Blocks. However, the Agricultural Officer, Extension Officers (Agriculture and Co-operation), Bank Inspector, and the Supervisor of the Co-operative Union in each of these blocks met a number of times and worked together to discuss and solve their mutual difficulties.

The Agricultural Assistants were asked to contact the Chairman and the Secretary of every Society in their circles and prepare a list of the members who would be eligible for borrowing through the societies. The defaulter members were to be eliminated from this programme unless they were prepared to purchase the seeds and fertilizers in cash. Where the societies themselves had been declared as defaulters, the programme was to be channelized through the block agency by giving taccavi loans. The Agricultural Assistants were asked to hold meetings in the villages and the Agricultural Officers for the programme themselves were to tour the villages to address such meetings personally. The Agricultural Officer in the southern Block did tour practically the entire Block for the programme but in the other Block where the variety was grown in summer, not much need was felt for such extensive efforts. Meetings were, therefore, organized only in a few villages in the northern Block and the Agricultural Officer contacted the cultivators in the other villages during his regular tour programme. One gets the impression that no pains were spared by these officials to make the whole programme a success.

Special leaflets describing the technique of cultivation of this variety were even printed in the Block in the northern

part. In the other Block, however, a few leaflets supplied by the District Agricultural Officer were passed on to the Agricultural Assistants for informing the cultivators about the technique of cultivation for this variety. The dose of fertilizers recommended in both Blocks was, however, 30 kgs. of nitrogen per acre and not 40 or 60 kgs. as recommended at the District and the State level.

Distribution of seeds and achievement of the target

The first consignment of seeds was received in the southern Block on the 21st of May. This seed was procured locally from the summer crop grown in the northern Block. The seed was received at intervals and the last consignment for this Block was received on the 28th of May. The seeds were, however, supplied quite late to the northern Block and all the seeds for this Block were received on the 4th of June. Since the latter Block was located near the central godowns of the District Sale and Purchase Union and since it was customary to sow the crop in the northern part only after the commencement of the monsoon, this Block was supplied with the seeds from the last consignments. The practice in the southern part was, on the contrary, to sow the seeds in the dry soil sometime by the end of May before the outbreak of the monsoon. Anyhow, the seeds were supplied quite in time in both Blocks. Since the locally procured seed was ready for distribution earlier, the southern Block was supplied with a part of the seed from the local procurements from the northern part and a part of the seeds from Andhra Pradesh whereas the northern Block received the seeds supplied entirely from Andhra Pradesh.

The details about the distribution of seeds under the nursery and the normal scheme in the selected Blocks have been given in Table 6.

The programme either under the nursery or the normal scheme was undertaken in practically all villages excepting a few in each Block. In the southern Block, the programme was undertaken through 53 of the 63 Societies and the remaining 10 Societies could not participate in the programme as they were declared as the defaulter societies by the Bank. Two of the 53 societies were also defaulter societies but taccavi loans were specially channelized to the members of these societies by the Zilla Parishad for the implementation of the programme. So was the case with 6 of the 24 societies in the northern Block through which taccavi loans were channelized for the cultivation of the new variety. As a result, all the societies in this Block could participate in the programme. The response for the nursery scheme was also fairly wide in the northern Block as, as many as 21 of the 22 Grampanchayats could participate in the programme. On the contrary in the Southern Block 13 of the 60 Grampanchayats did not participate in the programme.

If one refers to the quantum of seeds distributed in these two Blocks under the two schemes one would find that a greater quantum of seed was distributed in the southern Block when compared to the northern one even though a relatively large number of Grampanchayats and societies had taken active part in the programme in the northern Block. An area of 4217 acres could be covered under the programme in the southern Block whereas the area that could be brought under the variety in the northern Block came to 3712 acres. The quantum of seed distributed for the purpose in the southern and the northern Block were 516 and 371 quintals respectively but these quantities had no relationship with the areas covered as the earlier Block was

supplied mainly with 15 kgs. bags whereas the latter Block received only the 10 kgs. bags. The reports about the area covered were based entirely on the number of bags supplied to the cultivators and each bag was taken to cover an area of one acre irrespective of the size of the bag.

Table 6: DETAILS ABOUT THE DISTRIBUTION OF PADDY TN-1 SEEDS IN THE SELECTED BLOCKS.

I t e m	Southern Block	Northern Block
I Distribution of seeds for the nursery programme		
1. Number of Gram-panchayats in the Block	69	22
2. Number of Gram-panchayats participating in the nursery programme	56	21
3. Number of bags distributed for the nursery programme	1894	1890
4. Quantity of seeds distributed (quintals)	232.3	189.0
5. Area covered under the nursery programme (acres)	1894	1890
II Distribution of seeds through the Co-operative Societies under the Normal Scheme		
1. Number of Co-operative Societies in the Block	63	24
2. Number of societies through which the seeds were distributed	53	24
3. Number of bags distributed through the Societies	2323	1822
4. Quantity of seeds distributed (quintals)	284.1	182.2
5. Area covered under the normal Scheme (acres)	2323	1822
III Total seed distribution		
1. Number of villages in the Block	167	147
2. Number of villages in which the seed was distributed	152	140
3. Total number of bags distributed	4217	3712
4. Quantity of seeds distributed (quintals)	516.40	371.2
5. Total area covered under paddy TN-1 (acres)	4217	3712

Distribution of fertilizers

The first consignment of fertilizers was received in the southern Block on the 15th May and in the northern Block on the 10th June. The delay in the case of the northern Block was for the same reason of its location near the central godowns of the District Sale and Purchase Union as in the supplies of seeds. The supply of fertilizers was quite in time but it continued even in the month of June in the case of the former Block and upto August in the case of the latter. Upto the 30th of June, the southern Block was supplied with 323 tons of manure mixture and 450 tons of ammonium sulphate together valued at Rs. 2.49 lakhs and fertilizers worth Rs. 17,000 were supplied later in July and August. Compared with the supplies for the previous year, the quantum of fertilizers supplied to the southern Block during the year was much large as only 60 tons of fertilizers were supplied to this Block during the previous year. Figures were not available for the supplies made to the northern Block as the societies in this Block were supplied with fertilizers directly by the District Sale and Purchase Union and not by its agency at the block level. In addition to the regular supplies of fertilizers through the societies, 11.6 and 32.0 tons of ammonium sulphate were supplied free for the nursery programmes in the southern and the northern Block respectively. As per instructions from above, instructions were issued to the Co-operative Societies and the Gram-sevaks to give preference in the supply of fertilizers to those cultivators who had purchased the paddy TN-1 seeds.

Disbursement of loan in cash

The work of preparing the N.C. Statements was commenced in both Blocks quite in time in the first week of May. The Bank could, however, sanction credit for paddy TN-1 for 38 out of the 63 societies in the southern Block and for only one out of the 24 societies in the northern Block. Quite a large proportion of the societies in the latter Block had been declared as the defaulter societies and hence they were not eligible for fresh loans. Secondly, many of the societies had already borrowed finance under the short term and the other credit facilities. Quite a large number of societies could not, therefore, become eligible for the fresh loans for the High Yielding Varieties Programme.

In spite of these sanctions for the special loan, the societies themselves did not come forward to lift up the loan. Only one society in the northern Block lifted a loan of Rs. 8,200 for its members against the statement sanctioned for the High Yielding Varieties Programme whereas not even a single society in the southern Block came forward to disburse the loan. All the sanctions for the southern Block, therefore, remained unutilized. The cultivators in both Blocks had already received their cash loans through the N.C. Statements prepared earlier for the short term and the "Japanese Method of Paddy Cultivation" Loans. An amount of Rs. 6.78 lakhs had been disbursed by this time in the southern Block through these schemes as against only Rs. 4.99 lakhs in the previous year. So also Rs. 8.52 lakhs had been disbursed in the northern Block as against the disbursement of Rs. 8.54 lakhs in the previous year. The cultivators desiring to grow the TN-1 variety had also received the fertilizers either against these earlier N.C. Statements or without the execution of bonds. There was, therefore, no more need for the cultivators to borrow for the Taichung Variety. Except for the single society mentioned above none of the societies, therefore, came forward to disburse the amounts sanctioned specially for the High Yielding Varieties Programme.

Use of pesticides

The programme of spraying was undertaken in both Blocks by the Home Guards. The spraying was commenced by the 8th of August in the southern Block and roughly by the same time in the other Block. The Home Guards completed the first spraying over the entire area in the southern block except for a part of a village which could not be covered because of certain difficulties. The area sprayed, however, came to 2258 acres only as against the achievement of the target over 4000 acres as reported by the Block Agency. The Platoon Commandant stated emphatically that all the area assigned to them by the Agricultural Assistants was completely covered except the small part of a village mentioned above. This clearly indicated that there was a gross difference between the area actually brought under the variety in this Block and the area reported to have been brought under the variety by the Block Agency. It was not possible to know about the area sprayed in the northern Block as we could not meet the Platoon Commandant of that area.

Post-distribution organization

The rains commenced on the 5th of June in the southern Block and on the 8th of June in the northern Block. The crop germinated within a fortnight. The germination of the seeds which were procured locally and sent in part to the southern Block, was found to be somewhat poor. Greater emphasis was, therefore, laid in this Block on the preparation of nurseries through the Gram-panchayat at this stage, as was stated by the Agricultural Officer for the Block. ¹/ The seeds obtained from Andhra Pradesh had germinated well and there was, therefore, no problem about the germination of the seeds in the northern Block.

The rains, however, disappeared for sometime in July. The variety also flowered quite early in both Blocks. It became very difficult for the officers in both Blocks to convince the people about the productivity of the new variety. No leaflets were issued through either of these Blocks though the Chief Executive Officer of the Zilla Parishad had advised the Block Development Officers to inform the people about the use of fertilizers to counteract the effects of early flowering.

One more problem which had come up with the variety at this stage was that it was becoming difficult to uproot the seedlings as the seedlings could not be easily uprooted along with the roots. Actual digging had to be resorted to in certain cases to avert this difficulty. There was also some wastage of seedlings on this account. The District Agricultural Department suggested that if ammonium sulphate was to be thrown over the seedlings a day before uprooting them, it would help the uprooting. This advice, however, reached the farmers after the transplanting was nearly over. No leaflets were again, issued for the purpose.

1 Poor germination of the locally procured seed was stated to be the main reason for the splitting up of the total target not on the 50:50 basis but in favour of the nursery programme in this Block. This reason was put forth by the Agricultural Officer for the scheme of Intensive Cultivation of Food Crops. As a matter of fact, the seed distributed earlier had not germinated and the results of germination were not even known to the officers in the Block when the seed was distributed for the nursery programme.

IMPLEMENTATION OF THE PROGRAMME IN
THE SELECTED VILLAGES

1

Characteristics of the selected villages

All the four selected villages were relatively small in size and had a population varying between 299 and 729 persons. The average population worked out to 500 persons per village. There were 189 households in the two villages selected from the Southern Block and 201 households in the villages selected from the northern Block. These households stayed in 163 and 182 houses in the villages in these two Blocks respectively. Eighty-three per cent of the houses in the southern Block were, however, tiled whereas most of the houses in the villages in the northern Block were thatched with paddy straw. This gave the immediate impression that the cultivators in the villages in the southern Block belonged to a somewhat better living class. This was also so as quite a large number of persons from the villages in the southern Block were employed either in the military or in the industries elsewhere. As a result, as many as 50 of the 189 households in the villages selected from the southern Block consisted mainly of women and children but only 6 households in the villages from the northern Block belonged to this category. Most of the households in the southern Block were also engaged in cultivation. In the northern Block, however, only three-fourths of the households were engaged in cultivation and the remaining households were engaged in labour. These labour families belonged mainly to the trival Thakur and Katkari communities. A few of the households of these communities were also engaged in cultivation but in many a cases the lands they held were suitable only for growing the inferior hill millets as ragi and vari. Except in one village, all the cultivating families in the remaining three villages were engaged in the cultivation of paddy as would be seen from the data given in the Appendix to this Chapter. To avoid the identity of these villages the two villages selected from the southern Block have been denoted by numbers 1 and 2 and the villages from the northern Block by numbers 3 and 4.

Paddy was the principal crop in all these villages. Inferior millets such as ragi and vari occupied upto a fourth of the cultivated area therein. Quite large acreages in the villages in the northern Block were being irrigated in the rabi season and were being used for the production of vegetables. Summer paddy had been introduced in village No. 3 since the last 3-4 years and the TN-1 variety of paddy was also grown on 32 acres in this village in the summer of the year 1966. No attempts were made in village No. 4 for growing paddy in the summer with the help of irrigation. Irrigation was totally absent in village No. 2 in the southern Block whereas hardly a couple of acres had been brought under vegetable cultivation lately in village No. 1 in the same Block.

Despite the small size of these villages, there was a school in every village, imparting education either upto the 4th or the 7th standard. Each of these villages was under the jurisdiction of a Group Grampanchayat and a Primary Cooperative Society, covering a few of the neighbouring villages.

1 Figures relating to the characteristics of the four selected villages and the various aspects of the implementation of the programmes therein, have been presented in the Appendix to this Chapter.

The targets and the dissemination of knowledge about the programme

The four Agricultural Assistants for these four selected villages had under their jurisdiction a number of villages varying from as many as 10 to 13. They were informed about the targets for this programme in the Block meetings which were held by the end of April. Each of these Agricultural Assistants had been given a target of implementing the programme over about 500 acres or so in the villages under their jurisdiction. The Agricultural Assistants in the villages in the southern Block had been given the liberty to break up the targets over the villages whereas the targets for the individual villages under the jurisdiction of the Agricultural Assistants in the northern Block had been fixed through the Block itself. These targets were to be achieved entirely by supplying seeds to the farmers either on credit or for cash, through the societies.

Meetings were held in village No. 1 and 2, to inform the cultivators about the new variety and its high productivity. In village No. 1 the meeting was attended by the Vice Chairman of the Panchayat Samiti as well as the Agricultural Officer for the programme. Whereas, in village No. 2 the meeting was organized by the Agricultural Assistant himself and the Agricultural Officer visited the village only in the first week of June when he learnt that it was difficult to organise the programme in the village. The Agricultural Assistant in village No. 3 had been transferred to an irrigation project, for some time and there was also no need to guide the cultivators about the programme as the cultivators had already experienced the high yielding nature of the variety from the summer crop grown in this village. The Agricultural Assistant in village No. 4 had been, however, facing many difficulties in implementing the target in his area and he had, therefore, to specially request the Block Development Officer and the other officials to visit the villages and hold meetings to pave his way for the achievement of the target. Through all these meetings in the different villages, it was emphasized that the variety would produce about 20 quintals of paddy per acre which meant that it would be possible to nearly triple the production merely through selecting this variety. It was also emphasized that preference would be given in the distribution of fertilizers to those who would agree to grow this special variety. The meeting in village No. 1 was, however, held on a day when there was a religious function in one of the households and only a few cultivators could therefore, attend the meeting. In the meeting in village No. 2, there was a dissension on the issue of giving preference in the distribution of fertilizers to those growing the new variety and one of the groups in this village even challenged the Agricultural Officer in this matter.

The Agricultural Assistants prepared lists of the cultivators who would participate in the programme with the help of the Chairman and the Secretary of every society. It was observed in village No. 2, that the backward class cultivators in this village, belonging to the Navbuddha Community were practically eliminated in this process of dissemination of knowledge about the new variety. On the contrary in village No. 4, it was observed that the Agricultural Assistant had contacted even the tribal Thakur and the Katakari communities for the programme. So was the case in village No. 1 wherein even the Navbuddha families were persuaded to participate in the programme. Whether to persuade a section of the cultivating class for participation in the programme or not, it appears, depended entirely upon the efficiency of the Agricultural Assistants and the nature of the mutual contacts they had developed in the villages. The Secretaries of the Cooperative Societies also took active part

in the programme in collaboration with the Agricultural Assistants and sent the N.C. Statements for the programme for their societies to the Bank in time. The Agricultural Assistants were informed about the nursery programme involving the free distribution of seeds, by the end of May or first week of June when all those cultivators who were desirous of growing the variety had purchased the seeds either in cash or on credit.

Distribution of seeds

The quantities of seeds distributed, seeds used by the farmers and the areas brought under the new variety in the selected villages have been noted in Table 7.

The distribution of seeds at the village level commenced with persuading the non-defaulting members of the societies in growing the variety since they were the cultivators who could purchase the inputs on credit needed for the variety. There were 30 non-defaulting cultivators among the 54 paddy cultivators in village No. 1. The Agricultural Assistant succeeded in distributing 637 kgs. of seeds among all these families. The supply of fertilizers for paddy cultivation was strictly linked with the purchase of paddy TN-1 seeds in the southern Block and those who wanted the so scarce fertilizers for paddy cultivation, had no alternative but to purchase paddy TN-1 seeds. A number of cases could be noted in this village wherein the cultivators purchased paddy TN-1 seeds merely to secure fertilizers for their crop. On the contrary, there was a dissension on this issue in the meeting held for the propagation of the variety in village No. 2 in the same Block. A group which was led by a retired policeman in this village resolved to defy such restrictions. As a result the Agricultural Assistant for this village could sell only 180 kgs. of paddy TN-1 seeds among 11 of the 120 paddy cultivating families in this village. The supply of seeds to this village was also somewhat delayed. Fourteen of the 25 cultivators who had agreed to try out the new variety initially had already sown the local variety and hence they could not purchase the seeds of the new variety. There was no problem with the distribution of seeds in village No. 3 in the northern Block as the cultivators had grown the variety during the summer. The Agricultural Assistant could, however, distribute 500 kgs. of seeds only among 16 of the 46 paddy cultivating families in this village, as a number of them possessed the farm produced seeds. In village No. 4, in the northern Block, on the contrary, it was possible to persuade only 9 of the 89 paddy cultivating families to purchase the seeds from the society as a large number of them were defaulters.

There was also another reason for such a low response for the purchase of the seeds through the society in village No. 4. All the Agricultural Assistants were informed about the nursery programme practically when the distribution of seeds through the societies was over. In village No. 4, however, the supply of seeds through the society was itself delayed on the point of supplying the inputs for this variety to the defaulter members. Moreover, there was some confusion at the level of the Supervising Union for the Block itself on this point. Before the society could distribute the seeds, the Agricultural Assistant received the bags of seeds for free distribution under the nursery scheme. Since no cultivator was interested in sowing the nursery seeds for the village panchayat, the Agricultural Assistant distributed the seeds free of cost among the cultivators desiring to try out the new variety. Once the seeds were received free, there was no need on the part of the cultivators to purchase the seeds on credit through the society on their account.

Table 7 : QUANTITY OF SEEDS DISTRIBUTED, SEEDS USED BY THE FARMERS AND THE AREAS BROUGHT UNDER PADDY TN - 1 IN THE SELECTED VILLAGES

ITEM	Southern Block			Northern Block			TOTAL
	Village No.1	Village No.2	Total	Village No.3	Village No.4	Total	
1 Number of paddy cultivating families	54	120	174	46	89	135	309
2 Quantity of seeds distributed through the Societies (kgs.)	637	180	817	500	120	620	1437
3 Number of cultivators getting the seeds through the societies	30	11	41	16	9	15	66
4 Quantity of seeds distributed for the village-panchayat nurseries (kgs.)	120	220	340	350	520	870	1210
5 Number of cultivators getting nursery seeds	6	10	16	11	25	36	52
6 Total quantity of seeds distributed either through the Societies or for the nurseries (kgs.)	757	400	1157	850	640	1490	2647
7 Total number of cultivators getting the seeds either through the Societies or for the nurseries or both	33	15	48	24	31	55	103
8 Number of cultivators getting the seeds not from the above two sources but either through their relatives or by borrowing	3	1	4	14	3	17	21
9 Total number of cultivators acquiring the seeds through all sources	36	16	52	38	34	72	124
10 Number of cultivators sowing the seeds	33	15	48	38	31	69	117
11 The target covered as reported by the Agricultural Assistants on the basis of the number of bags distributed (acres)	54.5	40.0	94.5	85.0	64.0	149.0	243.5
12 Area actually brought under the variety (acres)	29.5	12.05	41.55	75.0	19.3	94.3	135.85
13 Area under paddy held by the cultivators growing the new variety (acres)	85.35	48.30	133.65	159.05	76.25	235.30	368.95
14 Proportion of area under the new variety to the area under paddy (percent)	34.5	24.1	31.1	47.2	25.3	40.1	36.8

The seeds supplied for the nursery programme were distributed free of cost among the individual cultivators in the other three villages also. This was so because it was not possible for village panchayats to have their own nurseries. The Agricultural Assistants in the villages in the southern Block were instructed to distribute the nursery seeds among the individual cultivators after the selection of the cultivators with the consent of the chairman of the village panchayat. The Agricultural Assistants in the villages in the northern Block selected the cultivators on their own account. The supply of the nursery seeds to the villages in the southern Block was, however, much delayed. Many cultivators had even sown their before crops were distributed for raising the nurseries. the seeds

The free supply of seeds for the nurseries led to great many malpractices in the process of seed distribution. The Agricultural Assistants made an attempt to distribute the nursery seeds and the seeds under the normal scheme in a disproportionate way in the different villages in their circles merely to accomplish the total targets of seed distribution for their circles. It was possible to accomplish the target fully in the southern Block on this account. Secondly, in the process of distribution, the Agricultural Assistants got an opportunity to favour some cultivators at the cost of the others. Even those cultivators who had purchased the seed from the society were given the nursery seeds. This resulted in such a large supply of seeds to a few cultivators in these villages that the quantities of seeds they had received, far exceeded the quantities they required to bring their entire holdings under the new variety. Moreover, it was inevitable to avoid the duplication in the supply of seeds to some cultivators in village No. 1 and 3 as the number of cultivators who could participate in the programme was nearly exhausted after the distribution of seeds through the society. A large part of the nursery seed was also distributed among the cultivators who were defaulters and who were not eligible for the supply of seeds through the societies. Moreover, the Agricultural Assistant for village No. 4 took this as an opportunity and he could accomplish his target by distributing the nursery seeds mainly among the defaulters who were in a majority in this village. A few of the cultivators in village No. 3 and 4 received even upto 5 to 6 bags or 50 to 60 kgs. of the seeds free. There were yet a few cultivators who were desirous of trying out the variety but they could not receive the seeds through either of these sources (Table 7). They had to share the seeds with their relatives and neighbours purchasing the seeds through the societies. In village No. 4, it was observed that one of the cultivators belonging to the tribal community, had borrowed the seeds from another cultivator receiving the free nursery seed, at 25 per cent rate of interest. The nursery seed distribution was, however, a free distribution and none of the cultivators questioned such disparities in the distribution of seeds. Moreover, no cultivator could come to know of the quantities, others received free. Further in village No. 1, the nursery seed was distributed in terms of fractions of a bag such as 1.5 bags or 2.5 bags as was recorded in the accounts maintained by the Agricultural Assistant. After interrogating the cultivators receiving these seeds it was, however, discovered that the cultivators receiving 1.5 bags had received only one bag and those receiving 2.5 bags had received only 2 bags. These interrogations were made on the face of the Agricultural Assistant himself. It was observed that 3 bags or 30 kgs. of seeds valued at Rs. 34.5 remained unaccounted for in this process of distribution even though the records maintained by the Agricultural Assistant were quite clear and above all suspicion. There was also a gap in the quantities recorded for

the nursery seed distribution and the quantities received by the cultivators in a few cases in village No. 3. The free nursery seed distribution thus, resulted in an over supply of seeds to some of the cultivators, supply of seeds to the defaulters who were incapable of acquiring the other inputs for the crop and it provided a great scope for malpractices and fraudulent behaviour on the part of the Agricultural Assistants. This naturally had an impact on the manner in which the seeds could be used by the cultivators.

Use of the seeds supplied

Since a number of cultivators receiving the nursery seeds in the southern Block had already sown their crops before the nursery seed distribution, they could not sow the nursery seeds. In village No. 1, it was observed that out of the 6 cultivators receiving the nursery seeds (Table 7) only 3 cultivators had used a part of the seed for resowing as the germination of the seeds received from the society was unsatisfactory. One cultivator plainly confessed that he had consumed the seeds whereas the other two cultivators gave suspicious replies because of the presence of the Agricultural Assistant during these interrogations. In the implementation of the nursery programme in this village therefore, it was clear that 30 kgs. of seed was consumed by the Agricultural Assistant himself whereas a larger part of the remaining 90 kgs. of seed was consumed by the farmers receiving the seed. Moreover, the nursery seed distribution could not add to even a single acre under the variety in this village.

As far as the use of the nursery seed was concerned, similar was the nature of observation in the other villages though the magnitude of the wastage of seed varied from one village to the other. In village No. 2 for example, one of the cultivators receiving only the nursery seed had not sown it whereas three cultivators receiving 70 kgs. of the nursery seed had used only a part of it over an area of 1.25 acres. In village No. 4 again three cultivators had not sown the nursery seed. In many a cases in village No. 3 and 4, only parts of the nursery seed were used for growing the crop.

Even the seed which was purchased through the societies was not used fully. This was for the obvious reasons that the seed was packed in 10 and 15 kgs. bags whereas the farmers wanted to try out the variety only on fractions of an acre or so. So also some of the farmers especially in the southern Block, had to purchase the TN-1 seed merely to get the fertilizer for the local variety.

All these factors leading to a wastage of the valuable seed, had an impact on the actual per acre rate of seed at which these villages were supplied with the seed. From the quantities of seeds supplied to these villages and the areas devoted by the farmers to the variety in these villages, the per acre input of seed worked out to 25.6 kgs., 33.1 kgs. and 33.2 kgs. for village No. 1, 2 and 4 respectively. It was not possible to work out a similar seed-rate for village No. 3 as a part of the seed was farm produced. There was, thus, a gross wastage of seed when compared to the recommended seed rate of 10 to 15 kgs. per acre.

The areas brought under the new variety in village No. 1, 2 and 4 were 29.5, 12.05 and 19.3 acres respectively (Table 7) whereas according to the reports of the Agricultural Assistants, these areas came to 54.5, 40.0 and 64.0 acres in the respective villages. It was only in village No. 3 where a part of the seed

was farm-produced that the gap between the report of the Agricultural Assistant and the area brought under the new variety was found to be narrow. After adding up these data for all the selected villages, one finds that the coverage reported by these Agricultural Assistants was 180 per cent of the areas actually brought under the variety. If one excludes village No. 3 from these calculations then the proportion works out to as much as 260 per cent.

Except for village No. 2, the response of the cultivators to the variety appeared to be quite good as more than one third of the cultivators had tried out the variety in the first year itself. The response was the best in village No. 3 wherein nearly 83 per cent of the cultivators had participated in the programme. It is only in village No. 2, that the response was poor partly because of the discussions on the point of the supply of fertilizers and partly because of the delay in the supply of seeds. The cultivators growing the new variety had again devoted quite significant proportions of their holdings for growing this variety. In village No. 2 and 4, the variety was grown on nearly one fourth of the total paddy holding of the cultivators participating in the programme whereas in village No. 1 and 3, the variety occupied 34 and 47 per cent of the total paddy holding of the participating cultivators in these villages respectively.

Extent of participation and the size of the holdings

The participants and the nonparticipants in the selected villages have been classified according to the size of the holdings under paddy in Table 8. It would be observed from the table that the total number of paddy cultivators in the selected villages was 309 out of whom 37.86 per cent had participated in the programme. The extent of participation was quite low and around 10 per cent in the first two size groups upto one acre but above this acreage the extent was quite large rising upto 86 per cent in the groups upto 5 acres. In the last group, however, the extent of participation was somewhat low because of the nonparticipation of 3 of the cultivators in this size group from village No. 4, who belonged either to the carpenter or the barber community. Barring such cases in village No. 4, all the cultivators having a holding above 4 acres in the remaining three villages had participated in the programme. This was, however, evident because it was possible for the large holders to devote a part of their holdings for trying out the new variety whereas the small holders had no alternative but to devote either their entire holdings or at least a major part of their holdings for the purpose if they desired to follow the large holders. Yet a few of the cultivators in the first two groups in village No. 1, 3 and 4 had tried out the variety. None of the cultivators in these groups in village No. 2 had, however, sown the crop even though more than 50 per cent of the cultivators in this village were small holders. This was evident for the reasons already noted earlier.

It is from among these participants and the nonparticipants that a sample of 60 participants and 40 nonparticipants was drawn for the purpose of this enquiry as noted in Chapter 1. The selected cultivators have been classified according to the size of the cultivated holding (and not the paddy holding as in Table 8) in Table 9. It would be observed from this table that the proportion of participants went on increasing from 12 per cent to 87 per cent from the lowest to the highest group. This was, also in accordance with the trend of participation in relation to the size of the holding under paddy noted in the earlier table. Out of the 60 participants only 4 had a holding

Table 8 : CLASSIFICATION OF THE PARTICIPANT AND THE NON-PARTICIPANT FAMILIES IN THE SELECTED VILLAGES ACCORDING TO THE SIZE OF HOLDING UNDER PADDY.

Size group (acres)	Village No. 1			Village No. 2			Village No. 3			Village No. 4			T o t a l			Percentage of the participants to the total number of paddy cultivators
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
I 0.01 - 0.50	1	5	6	-	31	31	2	1	3	2	18	20	5	55	60	8.33
II 0.51 - 1.00	1	6	7	1	31	32	2	5	7	3	11	14	7	53	60	11.66
III 1.01 - 2.00	14	6	20	3	36	39	4	1	5	11	16	27	32	59	91	35.16
IV 2.01 - 3.00	8	5	13	5	5	10	12	1	13	6	5	11	31	16	47	65.95
V 3.01 - 4.00	5	-	5	4	1	5	5	-	5	5	3	8	19	4	23	82.60
VI 4.01 - 5.00	3	-	3	-	-	-	5	-	5	4	2	6	12	2	14	85.71
VII 5.01 & above	1	-	1	2	-	2	8	-	8	-	3	3	11	3	14	78.57
T O T A L	33	22	55	15	104	119	38	8	46	31	58	89	117	192	309	37.86

- 1 = Participants
 2 = Non participants
 3 = Total number of paddy cultivators.

Table 9 : CLASSIFICATION OF THE SELECTED FAMILIES ACCORDING TO THE SIZE OF THE CULTIVATED HOLDING

Size group (acres)	Village No. 1		Village No. 2		Village No. 3		Village No. 4		Total		Percentage of the participants in the total number of selected culti- vators	
	1	2	1	2	1	2	1	2	1	2		Total
I 0.01 - 0.50	-	1	-	1	-	2	1	3	1	7	8	12.50
II 0.51 - 1.00	1	2	-	2	1	4	1	1	3	9	12	25.00
III 1.01 - 2.00	4	3	3	6	-	1	3	3	10	13	23	43.47
IV 2.01 - 3.00	5	3	4	1	7	1	6	1	22	6	28	78.57
V 3.01 - 4.00	2	1	5	1	2	-	1	-	10	2	12	83.33
VI 4.01 - 5.00	2	-	1	1	2	-	2	1	7	2	9	77.77
VII 5.01 & above	1	-	2	-	3	-	1	1	7	1	8	87.50
TOTAL	15	10	15	12	15	8	15	10	60	40	100	60.00

1 = Participants

2 = Non-participants

upto 1 acre; 32 had a holding between 1 and 3 acres; 17 had a holding between 3 and 5 acres whereas the remaining 7 cultivators had holdings exceeding 5 acres. Out of the 40 nonparticipants, on the contrary, as many as 16 had a holding below 1 acre, 19 between 1 and 3 acres and only 5 cultivators had their holdings exceeding 3 acres.

Cropping pattern of the selected participants and nonparticipants

The size of the cultivated holding and the cropping pattern of the selected participants and nonparticipants is noted in Table 10. The participants cultivated on an average 3.18 acres whereas the nonparticipants cultivated 1.70 acres. Practically the entire cultivated holding in the case of both was being used for the cultivation of the kharif crops. About one seventh of the holding in case of the participants and about one ninth of the holding in case of the nonparticipants was being used for the cultivation of the rabi crops. The double cropped area nearly corresponded to the area under the rabi crops in case of the participants whereas the difference between the two areas in case of the nonparticipants was insignificant. The participants had devoted 33.5 per cent of the area under the kharif crops to the cultivation of paddy TN-1, 56.8 per cent for local paddy and about 10 per cent for the other crops. The nonparticipants had used 85 per cent of the area for local paddy and the remaining 15 per cent for the cultivation of the other crops. About 60 to 70 per cent of the area under rabi crops in case of both the participants and the nonparticipants was under rabi paddy and the remaining under the other crops especially vegetables. Though this proportion was nearly equal in case of both these groups of cultivators, the size of the holding under vegetable cultivation was much smaller in case of the nonparticipants when compared to the participants.

Both the participants and the nonparticipants had planned to grow TN-1 over about 70 per cent of their paddy area in the rabi season. Since the rabi crops had not been sown by the time of the investigations in the month of December the above discussions for the rabi crops relate to only the crops planned and not the crops sown. It is, however, interesting to note that the cultivators who did not participate in the programme in the kharif season had also planned to devote some area to paddy TN-1 in the rabi season whereas some of those who had participated in the programme had planned to grow a local variety for a part of their area even after an experience with the nature of paddy TN-1 in the kharif season. This was an indication that the variety had not yet been completely accepted by the cultivators but it had to undergo even further trials.

The table would further indicate that the participants in the smaller size groups had devoted a larger proportion of their holdings to paddy TN-1 than the participants in the upper size groups. In the first size group for example, the entire holdings were devoted to this variety whereas in the second group 87 per cent of the area was under this variety. This percentage, however, declined to 40 per cent in the middle size groups and to 30 per cent in the upper size groups. There was, thus, no alternative for the small farmers desiring to try out the variety but to devote their entire holdings for the variety. The large holders could, on the contrary, devote small proportions of their holdings to the new variety and grow their normal varieties over the other parts.

Table 10 : CROPPING PATTERN OF THE SELECTED FAMILIES

Size group	Partici- pants or non-parti- cipients	Average size of sown culti- vated holding (acres)	Area more than once (ac- res)	Total cultivated area per family (acres)			K h a r i f Area under			R a b i Area under			Percent of area under Paddy TN-1 in the		Percent of area under other crops in the	
				Kha- rif	Habi area	Other area	Pa- ddy TN-1	Local or varie- ty	Other crops	Pa- ddy TN-1	Local or varie- ty	Other crops	Kharif season to the total kharif paddy	Rabi season to the total rabi paddy	Kharif sea- son to the total under the kharif sea- son	Rabi sea- son to the total area under the rabi season
1.01- .50	A	0.50	-	0.50	-	-	0.50	-	-	-	-	100.00	-	-	-	-
	B	0.40	-	0.39	0.01	-	-	0.39	-	-	0.01	-	-	-	-	100.00
0.51-1.00	A	0.71	-	0.71	-	-	0.54	0.08	0.08	-	-	87.10	-	11.27	-	-
	B	0.85	0.12	0.85	0.12	-	-	0.75	0.10	0.11	-	100.00	-	11.76	-	8.33
1.01-2.00	A	1.58	-	1.51	0.07	-	0.60	0.79	0.12	-	-	43.16	-	7.95	-	100.00
	B	1.59	0.04	1.55	0.08	-	-	1.33	0.22	-	-	-	-	14.19	-	100.00
2.01-3.00	A	2.64	0.59	2.63	0.60	-	0.97	1.44	0.22	0.38	0.11	40.25	77.55	8.37	-	20.00
	B	2.54	0.17	2.54	0.17	-	-	2.42	0.12	0.17	-	-	100.00	4.72	-	-
3.01-4.00	A	3.54	0.36	3.54	0.35	-	0.93	2.13	0.48	0.15	0.15	30.39	50.00	13.56	-	14.28
	B	3.38	0.50	3.38	0.50	-	-	2.25	1.13	-	0.50	-	00.00	33.43	-	-
4.01-5.00	A	4.52	0.61	4.46	0.61	-	1.63	2.32	0.57	0.43	-	41.47	100.00	12.61	-	34.85
	B	4.78	-	4.50	0.28	-	-	3.38	1.12	-	-	-	-	24.89	-	100.00
5.01 & above	A	6.77	0.71	6.77	0.71	-	1.93	4.38	0.49	-	0.29	30.59	0.00	7.24	-	60.56
	B	5.50	-	5.25	0.25	-	-	5.00	0.25	-	-	-	-	4.76	-	100.00
TOTAL	A	3.18	0.44	3.17	0.45	-	1.06	1.80	0.31	0.21	0.10	37.06	67.74	9.78	-	31.11
	B	1.70	0.09	1.67	0.12	-	-	1.44	0.23	0.05	0.02	-	71.43	13.77	-	41.67

A = Participants

B = Non-participants

Other factors limiting participation

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Apart from the size of the holding, creditworthiness etc. it was observed that a few other factors had also influenced the participation of the cultivators in the programme. One important factor which had influenced the participation of the cultivators was the absence of the male heads of the households in these villages and their employment outside. There were also a few cases in which the male heads of the households were disabled to work on the farm because of very old age or chronic illness and such households had therefore, refrained from trying out the new variety. In village No. 1, for example, only 3 of the 33 participant households belonged to the category of households wherein the male heads of the households were not staying in the village. On the contrary as many as 15 of the 21 nonparticipant households belonged to the above category. So also in village No. 2 none of the households of the above category had participated in the programme even though as many as 22 households of the above category had grown local paddy. There were only 8 nonparticipant households in village No. 3 and in three of these households the male heads of the households were employed outside the village in industries. There were no households of such a category in village No. 4.

In the sample of cultivators selected for the detailed enquiry it was observed that out of the 60 participant households only 5 belonged to the above category whereas in the sample of 40 nonparticipant households this category accounted for as many as 18 or nearly half the number of the selected households.

Maratha was the dominant cultivating community in all these villages. The participation of the other communities in the programme, however, varied from one village to the other. Though members of the Navbuddha community had participated in the programme in village No. 1, they had refrained from it in village No. 2 for reasons noted earlier. A few households of the tribal community had on the contrary participated in the programme in village No. 4. It was, however, observed that households of the communities such as the barbers and carpenters which were somewhat in large numbers in village No. 2 and 4 had refrained from the programme even though some of these households owned large sized farms.

The tenurial status of the cultivators was observed to have no relation to the participation of the cultivators in the programme. Even some of the tenants had participated in the programme. Moreover, it was observed through the study of the selected families that the participants owned only 68 per cent of their cultivating holding whereas the nonparticipants owned 85 per cent of their holding. There were two reasons responsible for this. Firstly, paddy was a seasonal crop and it did not involve any investment on the part of the cultivators. Secondly, the tenant cultivators were fully protected against any ejection from the land through the tenancy legislation in the State. In village No. 4, the compensation which the tenants were to pay to the landlords had even been settled.

Distribution of fertilizers and their use

Fertilizers were distributed either by the end of May or in June in all the selected villages. Ammonium sulphate and manure mixture (9:9:5) were distributed in village No. 1 and 4 whereas only ammonium sulphate was made available to village No. 2 and 3. There was a great demand for the manure mixture

especially in village No. 2. It was, however, not possible to organize the supplies of fertilizers according to the nature of demand in all areas as whatever type of fertilizer that reached the Taluka Sale and Purchase Union from the District Union, had to be supplied in truck loads immediately to one area after the other.

The per acre dose of fertilizer recommended in these villages was either 150 kgs. of ammonium sulphate and 100 kgs. of superphosphate valued at Rs. 93 or 150 kgs. of manure mixture and 50 kgs. of ammonium sulphate valued at Rs. 96. These fertilizers were to be applied in two doses, the second dose being of 50 kgs. of ammonium sulphate only. This recommendation thus, implied a dose of 30 kgs. of nitrogen and 15 kgs. of phosphoric acid valued at about Rs. 95 per acre.

All those getting the seeds through the societies were supplied with fertilizers as far as possible with reference to the above recommendation but those getting the seeds for the nursery programme could get only small quantities of fertilizers which were to be used for raising the seedlings only. The quantity to be supplied for the nursery programme was 15 kgs. of ammonium sulphate for 10 kgs. of the seed and it was to be given free. Those cultivators getting the seeds both from the society and also for the nursery, could get fertilizers at least from the cooperative societies. But these cultivators getting only the nursery seed had to grow the variety entirely with this meagre supply of fertilizer made for the nursery.

Though the quantum of fertilizer distribution through the societies was to be with reference to the recommended dose the actual quantities given to the farmers varied from one individual to the other. This was, however, either due to the short supply of fertilizers available at a time or partly due to the reluctance on the part of some of the farmers to borrow large quantities of fertilizers on their accounts. The details of fertilizer distribution and its use in the selected villages have been given in Table 11.

The entire fertilizer distributed through the society in village No. 1 was meant for growing paddy TN-1 whereas in village No. 2 about one third of the fertilizer was distributed for the new variety and the remaining for local paddy. In village No. 3 again only one tenth of the fertilizer distribution was meant for paddy TN-1 and the remaining for the local varieties. In this village, however, the fertilizer distribution was mainly with reference to the N.C. Statements prepared for the Japanese Method of Paddy Cultivation loans (J.M.P.C.) and those purchasing the paddy TN-1 seed through the society or using their farm-produced seed were advanced credit on the J.M.P.C. account. Only three of the cultivators who could not borrow on the J.M.P.C. account were given fertilizer specially on the paddy TN-1 account. In village No. 4, the quantum of fertilizer distributed was itself very meagre because of the presence of a large number of defaulters in this society. A larger part of the fertilizer was, however, distributed among those purchasing the paddy TN-1 seed through the society.

The supply of fertilizers in all the villages except in village No. 3, was made hurriedly and practically without any reference to the N.C. Statements. Only the defaulter members were eliminated from this distribution. Though the bonds had not been executed, the transactions had been

Table 11: DETAILS OF FERTILIZER DISTRIBUTION AND ITS USE IN THE SELECTED VILLAGES

I t e m	Village No. 1	Village No. 2	Village No. 3	Village No. 4
1. Value of fertilizers distributed through the societies (Rs.)	3717	3278	5758	1448
2. Value of fertilizers distributed through the societies for paddy TN-1 (Rs.)	3717	998	508*	1147
3. Average value of the fertilizers supplied through the society per bag of the seed supplied through the same source (Rs. / bag)	87.4	55.4	*	95.6
4. Value of fertilizers distributed for the nursery (Rs.)	54	138	235	357
5. Average value of the fertilizers supplied through the society and for the nursery per bag of the seed supplied through the two sources (Rs. / bag)	73.2	28.3	*	23.8
6. Average value of the fertilizers available per acre of the area actually sown (Rs./acre)	127.8	94.2	*	78.8
7. Actual input of fertilizers by the selected participants for paddy TN-1 (Rs./acre)	99.8	66.4	30.8	28.6
8. Actual input of fertilizers by the selected participants for local paddy (Rs./acre)	5.69	15.23	2.57	Nil

* The fertilizer distribution even for paddy TN-1, in this village was with reference to the N.C.Statement for the J.M.P.C. loan. Only 3 of the cultivators who could not borrow on the J.M.P.C. account were given fertilizers worth Rs. 508 with reference to the Taichung scheme.

entered in the records of these societies and the amounts had been shown as debited to the Sale and Purchase Unions in the two Blocks.

The Agricultural Assistants supplied fertilizers for the nursery to those farmers getting the nursery seed. Here again the Agricultural Assistants were found to be indulged in malpractices since the fertilizer was to be distributed free. In village No. 1, for example, the Agricultural Assistant had shown in his records that a quantity of 1.8 quintals of fertilizer was distributed free for the programme. After interrogating the cultivators on the face of the Agricultural Assistant himself, it was observed that he had distributed only 1.3 quintals and not 1.8 quintals as shown in his records. It was not possible to know the whereabouts of half a quintal or 1 bag of ammonium sulphate costing Rs. 21. The same was observed to be the case in village No. 4 whereas it was not possible to verify the distribution in the other villages. The Agricultural Assistants had distributed the fertilizer in bags and groups of two or three cultivators were asked to share each bag irrespective of the quantity of seed they had received. Here again the cultivators had blindly signed the records or had entered their thumb impressions therein. On the part of the Agricultural Assistants, they complained that they could not weigh the quantities as they were provided with only a small balance which could weigh say upto 4 kgs. of fertilizer at a time.

It would be interesting to work out here the average per acre supply of fertilizers for the new variety in these villages and the actual per acre input of fertilizers in the respective villages as revealed through the study of the selected cultivators.

In village No. 1, the value of the fertilizers supplied for the variety worked out to Rs. 87.4 per acre or per bag of the seed supplied through the society (Table 11). Because of the nursery seed distribution, however, the value of the fertilizer supply per bag of the seed supplied in this village worked out to Rs. 73.2. This should have been the magnitude of the use of fertilizer in this village if all the seed and fertilizer was to be used properly. But as noted earlier much of the seed was wasted and hence the cultivators should have used fertilizer at the rate of Rs. 128 per acre for the area of 29.5 acres they had actually devoted to this variety. In fact, however, a study of the selected cultivators indicated that they had used fertilizer worth Rs. 99.8 per acre for the new variety and fertilizer worth Rs. 5.6 per acre for the local paddy even though they were supplied with the fertilizer strictly for the new variety. Moreover, the non-participants who were not given any fertilizer had used fertilizer worth Rs. 7.8 per acre for local paddy. It was not possible to know wherefrom the nonparticipants obtained their supplies!

Similar was the nature of observation in the other villages. In village No. 2 and 4 the supplies of fertilizer for the variety through the societies worked out to Rs. 55.4 and Rs. 95.6 per acre but because of the nursery seed distribution the supplies for these villages worked out to Rs. 28.3 and Rs. 23.8 per acre only. Because of the wastage of seed, the cultivators should have used fertilizer worth Rs. 94.2 and Rs. 78.8 per acre in these respective villages. In fact the survey revealed that the participants in these two villages had used fertilizer worth Rs. 66.4 and Rs. 28.6 per acre only. It was not possible to work out the supplies in village No. 3

as the fertilizer was supplied for the new variety under the common J.M.P.C. scheme. The participants in this village, had, however, used fertilizer worth Rs. 30.8 per acre only, for the new variety.

It may, thus, be observed that the supply of fertilizers through the societies was mainly according to the recommendations of the Block Officials in village No. 1 and 4, whereas it felt a little short in village No. 2 as only one type of fertilizer was supplied. In village No. 3, the supply was not with reference to the scheme for the TN-1 variety. Yet it would have been somewhat adequate for the cultivation of this variety in the village if the fertilizer was to be used mainly for the new variety. The nursery seed distribution which was not accompanied by adequate distribution of fertilizers created, however, a severe short-fall in the supply of fertilizers in all these villages. But as all the seed was not used by the farmers and as there was a tremendous difference in the seed rate recommended and the one adopted by the cultivators, the supply would have proved to be quite adequate for all these villages. It is, however, only in village No. 1 that the actual input of fertilizers was found to be in accordance with the recommended dose. In village No. 2, the input was about two third of the recommended dose whereas in village No. 3 and 4, the actual inputs were very low, the input being the lowest in village No. 4. Being engaged in the cultivation of vegetables during the summer, the cultivators in these latter two villages must have, thus, not used all the fertilizer that was made available to them for the new variety but reserved it for vegetable cultivation.

Disbursement of loan in cash

The seed and fertilizer distribution was without reference to any N.C.Statements in three of the villages as noted above. The cash loans were, however, distributed with reference to the N.C.Statements prepared earlier either for the short term or the J.M.P.C. Loans. But the disbursement of cash loan was meant for meeting in general the costs of cultivation of the farms as a whole and there was no provision as such for meeting the extra cash expenditures over the new variety.

In village No. 1, there was not much demand for loan in cash and hence only 14 of the 33 cultivators for whom the N.C.Statements were prepared earlier for the S.T. and J.M.P.C. Loans were given a loan of Rs. 1725. Each of these cultivators borrowed from Rs. 50 to Rs. 200 according to the size of his holding and his needs. In village No. 2 also, 45 members were supplied with a cash loan amounting to Rs. 2567 under the statements prepared for the J.M.P.C. loan. In village No. 3, only 25 members borrowed Rs. 14,647 under the S.T. and the J.M.P.C. loan schemes. In village No. 4, however, a large number of the members being declared as defaulters in the payment of the earlier loans, an amount of Rs. 2010 could be distributed among 4 non-defaulter members only. There was also a little demand for the cash loans from the cultivators in this village in the kharif season as a number of them were engaged in vegetable cultivation during the summer which provided them with the ready cash after the harvest of vegetables. The vegetable crop in this village was being, however, largely financed through the commission agents who were visiting the village very often. The commission agents had formed almost friendly relations with certain groups of cultivators in this village to maintain their clientele.

Post sowing implementation of the programme

In most of the cases, fertilizers were not used for the nurseries as it was the common practice in the area to prepare nurseries after burning cow dung and brush wood at the nursery sites. Raised beds were said to have been prepared for the nurseries in a few of the cases in village No. 4 only. In the other villages the seedlings were raised on the flat lands.

The transplantation of the seedlings commenced by the 5th of July in all villages. The seedlings under the nursery scheme were planted by the growers in their own fields and there was no distribution or sale of the seedlings as envisaged in the scheme. Only a few of the cultivators especially in village No. 2 and 3 could transplant the crop in the first week of July. The rains disappeared thereafter for about a fortnight. Attempts were yet made by the cultivators to transplant the crop by trying to stagnate the water in the concerned fields but in most of the cases, transplanting had to be postponed till the 18th of July whereafter the district received the normal rains. The transplanting continued even upto the 28th of July as recorded by the Agricultural Assistants in some of these villages.

All the cultivators observed that it was getting difficult to uproot the seedlings. There was also some wastage of seedlings on this account in a few cases. The advice to sprinkle ammonium sulphate over the seedlings a day before uprooting, however, reached the cultivators quite late after transplanting. However, it was noticed that the only cultivator who used ammonium sulphate as recommended, found that it did work well. The crop was sprayed by the Home Guards, for the first time in the second week of August in all these villages and the second spraying was not undertaken for reasons noted in the earlier chapter.

The early flowering of the crop created a clamour especially in village No. 3 and 4 in the northern Block. In some of the cases in village No. 4 the crop flowered before the 19th of July at the nursery stage itself as reported by the Agricultural Assistant to the Block Development Officer. One of the progressive cultivators in this village, therefore, himself transplanted the crop very carefully so that the flowers should not shed. He had, on the contrary, engaged casual labour for transplanting the local varieties. Because of the early flowering in this village, as a few of the cultivators reported, they could not use any fertilizer while transplanting the crop. Except in one case, the second dose of fertilizers was also not used for the variety. In village No. 3, the crop flowered by the 10th of August after transplanting. It, however, continued till the 3rd of September as recorded by the Agricultural Assistant in his notes. The crop flowered earlier in those cases in which the crop was transplanted late.

The flowers appeared for the first time in village No. 1 by the 4th of August and in a number of cases flowering took place between the 8th and the 12th. There was not much complaint about early flowering in village No. 2 as the flowers appeared in this village only after the 20th of August and the crop in all the fields had flowered by the 29th of August. The crop had flowered only a little earlier than the expectations of the cultivators in this village. None of the cultivators in any of these villages used fertilizers after flowering to counteract the effects of early flowering, as was recommended by the officials.

The extent to which this new variety gave higher yields in these selected villages will be noted in the discussions which are to follow in the next chapter.

APPENDIX: CHARACTERISTICS OF THE SELECTED VILLAGES

Items	Village Numbers			
	1	2	3	4
1. Population	299	729	382	590
2. Number of households	60	129	86	115
3. Number of houses	47	116	86	96
4. Number of tiled houses	40	96	22	about 5 - 6
5. Number of thatched houses	7	20	64	about 90
6. Number of households comprising only of women and children	22	28	1	5
7. Number of cultivating households	54	120	46	107
8. Number of paddy cultivating households	54	120	46	89
9. Landless households ¹	6	9	40	5
10. Number of households having the membership of the societies	32	60	44	45
11. Number of cultivators getting the seeds through the societies	30	11	16	9
12. Quantity of seeds distributed through the societies (kgs.)	637	180	500	120
13. Number of cultivators getting the nursery seeds	6	10	11	25
14. Quantity of seeds distributed for the nurseries (kgs.)	120	220	350	520
15. Total number of cultivators getting the seeds either through the societies or for the nurseries or both	33	15	24	31
16. Number of cultivators getting the seeds not from the above sources but either through their relatives or by borrowing	3	1	14*	3

1 Including the Government employees and teachers

* 14 cultivators in village No.3 had used the farm grown seeds

Items	1	2	3	4
17. Total number of cultivators using the seeds	33	15	38*	31
18. The target covered as reported on the basis of the number of bags distributed (acres)	54.5	40.0	85.00**	64.00
19. Area actually brought under paddy TN-1 (acres)	29.5	12.05	75.00	19.30
20. Seed rate worked out from the total distribution of the seeds (kgs./acre)	25.6	33.1	N.A.	33.2
21. Total value of fertilizers distributed through the society (Rs.)	3717	3278	5758	1448
22. Value of fertilizers distributed through the society for paddy TN-1 (Rs.)	3717	998	508++	1147
23. Average value of the fertilizers supplied through the society per bag of the seed supplied through the same source (Rs.)	87.4	55.4	++	95.6
24. Value of fertilizers distributed for the nurseries (Rs.)	54	138	235	357
25. Average value of the fertilizers supplied through the society and for the nursery per bag of the seed supplied through the two sources (Rs.)	73.2	28.3	++	23.8
26. The average value of fertilizers thus available per acre of the area actually sown (Rs.)	127.8	94.2	++	78.8

* 14 cultivators in village No. 3 had used the farm grown seeds

** Excluding the target covered through the farm grown seeds.

++ The fertilizer distribution in this village was mainly with reference to the N.C. Statements for the J.M.P.C. loan. The variety being grown largely through the use of the home-grown seeds, fertilizer was distributed to all those growing this variety along with the local varieties. Only 3 of the cultivators who could not borrow on the J.M.P.C. account were given fertilizers worth Rs. 508 for the Taichung scheme.

Items	1	2	3	4
27. Actual input of fertilizers by the selected participants for paddy TN-1 (Rs./acre)	99.8	66.40	30.79	28.64
28. Actual input of fertilizers by the selected participants for local paddy (Rs./acre)	5.69	15.23	2.57	NIL
29. Number of cultivators getting cash loan through the societies	14	45	25	4
30. Loan disbursed in cash through the societies (Rs.)	1725	2567	14647	2010
31. Remarks on early flowering	Some-what early	Not very early	Early	Quite early

CHAPTER 4

THE ROLE OF AGRICULTURAL CREDIT IN RELATION TO THE HIGH YIELDING VARIETIES PROGRAMME

The important aspects of the organization and implementation of the High Yielding Varieties Programme in the selected district at the district block and village levels, were noted in the last two chapters. The nature of the demand for credit and the quantum of credit disbursed through the cooperative structure were also noted at the relevant places in the same chapters. It is proposed to discuss in the present chapter the role played by the agricultural credit disbursed through the cooperative structure or through the other agencies, in the cultivation of the high yielding variety at the level of the cultivator himself. This is attempted through the various sections of the present chapter by using the data for the participant and nonparticipant cultivators selected for this enquiry. 1/

Outlays on the inputs

Before examining the outlays on the inputs for the high yielding variety, local paddy and the other crops, it is necessary to mention here the different concepts used and their meanings in the analysis of the data. The cash expenditures given in the different tables in this section include the expenditures incurred by the cultivators in cash as well as on credit. Fertilizers were, for example, purchased on credit and they have been treated as the cash expenditures in these tables. The cash expenditures also include the payable expenditures. Expenditures over certain items which were due and inevitable but not incurred by the time of the investigations such as land revenue, rent and wages for the permanent farm servants, have been included in the cash expenditures. In addition to the cash expenditures certain expenditures had to be incurred in kind such as wages for the casual labour and the permanent farm servants according to the conventions and the will of the employees. These expenditures have been separated from the cash expenditures and their imputed values were worked out. So also parts of certain inputs such as, the seed and fertilizer were received by the cultivators free as noted earlier and parts of the inputs as seed and farm yard manure were produced on the farms. The imputed values of such inputs were also worked out. From the cash expenditures and the imputed values of these kind inputs and the inputs obtained free, it was possible to determine the total costs over raising the crops, excluding the costs over family labour. Such total costs have also been noted in some of the tables in this section to get an idea about the proportions of cash expenditures in the total costs.

1. As this part of the survey was undertaken for the purpose of the All India Agricultural Credit Review Committee, the Ministry of Food, Agriculture, Community Development and Cooperation had suggested the compilation of the data in some uniform tables which were to be incorporated in the Reports to be sent to the Ministry by all the Agencies conducting similar surveys in the different States. Those tables have not been incorporated in the present revised and concise Report. The same data have been, however, presented in a different form in the various tables in this chapter.

Instead of giving the absolute figures for the expenditures and the costs in the tables, the per acre figures have been given to facilitate the comparisons. All the per acre calculations for an input in these tables, are, however, based on the total areas devoted by all the selected families to a respective crop and not the areas which were directly concerned with the input. The per acre expenditure over fertilizers for local paddy, for example, would refer to the total area under local paddy and not the area which received the fertilizers.

Overhead expenditures such as those on wages of the permanent farm servants and fodder for the bullocks, were attributed to each crop on the basis of the proportion of the area under a crop in the cropping pattern on a holding. This was inevitable since data were not collected for the inputs of the permanent farm servants or the inputs of owned bullock labour over each crop separately.

Expenditures incurred by the selected cultivators over the different crops

The cash expenses incurred by the selected participants and nonparticipants over the different crops have been given in Table 12 and 13. Both the incurred expenses as well as the expenses which were due but not incurred by the time of the investigations have been added together in these tables. The parts of the seeds and fertilizers received free, have been, however, noted separately in these tables. It would be noted from Table 12 that the total paid and payable expenditure together with the value of the free supplies, amounted to Rs. 323 per participant. Out of this amount, 51.54 per cent was due to the expenditures over paddy TN-1, 42.41 per cent was due to the local paddy and only 6.05 per cent was due to the other crops. In respect of the different items of inputs, it would be observed that the expenditures over a majority of the items in case of paddy TN-1 were larger than the expenditures over similar items in case of the local paddy. Ninety-two per cent of the expenditure over the seeds was, for example, that over the seeds of the TN-1 variety. As also nearly 80 per cent of the expenditure over fertilizers was due to the variety TN-1. Among the organic manures, the expenses over dung for paddy TN-1 exceeded the expenses over the same for the local paddy whereas sheep fold accounted for nearly half the expenses for both the varieties. Only 40 per cent of the cash expenses over casual labour were, however, due to the variety TN-1 and, local paddy accounted for 54 per cent of the expenditure. Similar was the case with the expenses over permanent farm servants, hired bullock labour and fodder which depended upon the areas devoted to these two varieties. It was observed in the earlier section that the average size of the area devoted to paddy TN-1 per family was only 1.06 acres as against an area of 1.80 acres for local paddy. The actual costs incurred over TN-1 were, however, greater than the costs incurred over local paddy which was mainly due to the larger value of the inputs of seed, fertilizer and manure over the former variety when compared to the latter.

The total paid and payable expenditures in case of the nonparticipants amounted to Rs. 130.5 per nonparticipant (Table 13). This expenditure per nonparticipant was only 44 per cent of the expenditure per participant. Nearly 90 per cent of this expenditure in case of the nonparticipants was, however, due to the local variety which covered on an average an area of 1.44 acres per nonparticipant as against an area of only 0.23 acres under the other crops. The expenditures over the different inputs for local paddy, therefore, far exceeded the

Table 12 : AVERAGE PER FAMILY EXPENDITURE OVER THE DIFFERENT CROPS IN CASE OF THE PARTICIPANTS

(Figures in Rs. per family)

Items of expenditure	Expenditure over all crops	Expenditure over paddy TN-- 1	Proportion of expenditure over paddy TN-1 to expenditure over all crops	Expenditure over local paddy	Proportion of expenditure over local paddy to expenditure over all crops	Expenditure over other crops	Proportion of expenditure over other crops to expenditure over all crops
1	2	3	4	5	6	7	8
1. Seed	14.78	13.62	92.16	1.03	6.99	0.13	0.85
2. Fertilizer	63.99	50.72	79.26	12.58	19.66	0.69	1.08
3. Organic manure							
1 Dung	0.53	0.50	93.75	-	-	0.03	6.25
2 Sheep Fold	10.50	5.00	47.62	5.50	52.38	-	-
4. Irrigation charges	-	-	-	-	-	-	-
5. Land revenue	17.84	6.74	37.75	10.41	58.35	0.69	3.90
6. Rent	32.05	16.25	50.70	13.08	40.82	2.72	8.48
7. Pesticides	-	-	-	-	-	-	-
8. Expenditure over casual labour.							
1 Preparatory tillage	0.87	0.08	9.61	0.03	3.85	0.76	86.54
2 Rabbing	-	-	-	-	-	-	-
3 Sowing	20.07	6.73	33.55	11.47	57.15	1.87	9.30
4 Transplanting	29.02	11.89	40.98	15.53	53.51	1.60	5.51
5 Interculture	6.89	3.57	51.75	2.85	41.35	0.47	6.90
6 Harvesting & threshing	47.56	19.61	41.23	26.58	55.90	1.37	2.87
Total	104.41	41.88	40.12	56.46	54.08	6.07	5.80

Table 12 : (contd.)

	1	2	3	4	5	6	7	8
9. Fodder		38.22	10.13	26.50	23.13	60.52	4.96	12.98
10. Hired bullock labour		5.68	2.13	37.39	3.10	54.69	0.45	7.92
11. Expenditure over permanent farm servants		20.40	7.02	34.43	11.67	57.18	1.71	8.39
12. Total expenditure		308.39	153.98	49.93	136.97	44.41	17.44	5.66
13. Material received free								
1 Seeds		8.24	8.24	100.00	-	-	-	-
2 Chemical fertilizer		6.31	4.24	67.13	-	-	2.07	32.87
Total		14.55	12.48	85.74	-	-	2.07	14.26
14 Grand Total		322.94	166.46	51.54	136.97	42.41	19.51	6.05

Table 13 : AVERAGE PER FAMILY EXPENDITURE OVER THE DIFFERENT CROPS IN CASE OF THE NON PARTICIPANTS

(Figures in Rs. per family)

Items of expenditure	Expenditure over all crops	Expenditure over local paddy	Proportion of expenditure over local paddy to the expenditure over all crops	Expenditure over other crops	Proportion of expenditure over other crops to the expenditure over all crops
1	2	3	4	5	6
1. Seed	0.98	0.85	87.18	0.13	12.82
2. Fertilizer	15.43	15.38	99.67	0.05	0.33
3. Organic manure					
1 Dung	-	-	-	-	-
2 Sheep fold	2.30	2.30	100.00	-	-
4. Irrigation charges	-	-	-	-	-
5. Land Revenue	10.44	9.90	94.82	0.54	5.18
6. Rent	11.50	11.50	100.00	-	-
7. Pesticides	-	-	-	-	-
8. Expenditure over casual labour					
Preparatory tillage	3.01	2.50	82.99	0.51	17.01
Rabbing	-	-	-	-	-
Sowing	2.50	2.50	100.00	-	-
Transplanting	14.08	11.88	84.37	2.20	15.63
Interculture	3.06	2.64	86.12	0.42	13.88
Harvesting & threshing	20.04	18.14	90.52	1.90	9.48
Total	42.69	37.65	88.20	5.04	11.80

Table 13 (contd.)

	1	2	3	4	5	6
9. Fodder		26.05	19.94	76.52	6.11	23.48
10. Hired bullock labour		5.28	4.88	92.42	0.40	7.58
11. Expenditure over permanent farm servants		15.75	14.19	90.10	1.56	9.90
12. Total expenditure		130.40	116.57	89.39	13.83	10.61
13. Material obtained free	Seed	-	-	-	-	-
	Chemical fertilizer	0.14	-	-	0.14	100.00
	Total	0.14	-	-	0.14	100.00
14. Grand total		130.54	116.57	89.29	13.97	10.71

expenditure over the same for the other crops. Since the non-participants had devoted a larger proportion of their holdings to local paddy when compared to the participants, it was also obvious that a larger proportion of the expenditure be incurred over local paddy by the nonparticipants when compared to the participants. The per acre comparisons of expenditures might, therefore, reveal more in these respects.

Per acre cash expenditures and the costs over the different inputs

The per acre cash expenditures and the costs for the participants and the nonparticipants have been given in Table 14. The size-wise distribution of the expenditures and the costs over seed, fertilizer and casual labour has been also brought out in Table 15. The size-wise distribution of the number of cultivators (total entries) obtaining the different inputs through the different sources has been given in Table 16. The results from these analyses of the data have been presented below itemwise.

Total inputs

The cash expenditures including the paid and payable expenditures over all crops in case of the participants and the nonparticipants were Rs. 93 and Rs. 76 per acre (Table 14). The total costs excluding the cost over family labour, over the same in case of these two respective groups of cultivators came to Rs. 142 and Rs. 117 per acre. For both groups, the cash expenditures accounted for 65 per cent of the total costs. The costs over paddy TN-1 came to Rs. 194 per acre and the cash expenditures came to Rs. 145. The cash expenditures accounted for three-fourths of the total costs. The costs and the cash expenditures over local paddy were around Rs. 125 per acre and Rs. 80 per acre in case of both the participants and the non-participants. The latter accounted for about 80 per cent of the total costs. The costs and the cash expenditure over paddy TN-1, thus, exceeded the costs and the cash expenditure over local paddy by Rs. 70 and Rs. 65 per acre respectively. Both the costs and the cash expenditures over the other crops were of a lower magnitude and the cash expenditures for these crops accounted for nearly 50 to 55 per cent of the total costs.

Seeds

The costs over the paddy TN-1 seeds were Rs. 22 per acre (Table 14). It meant an input of about 19 kgs. of seed per acre. The cultivators had, however, to incur a cash expenditure of Rs. 12.8 for the same as, a part of the seed was received free and a part of the seed in village No. 3 was farm-produced. Out of the 60 selected participants, in case of 11 participants the seed was produced on the farm; 13 participants had obtained the seed entirely free; 26 participants had purchased the seed whereas in case of the remaining 10 participants the seed was partly purchased and partly obtained free (Table 16). The size-wise distribution of these cultivators indicates that the free seeds had reached all the classes of the cultivators irrespective of the size of the holding. The size-wise distribution of the costs over the TN-1 seeds indicates that the costs over seed were lower in the largest size group when compared to the other groups.

The costs over the local paddy seed in case of both the participants and the nonparticipants were around Rs. 12 per acre (Table 14) and only 5 per cent of the cost over the seeds was incurred in cash. The cultivators had used largely the

Table 4: contd.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
8 Expenditure over/ casual labour	1 Preparatory tillage	A	0.26	0.26	100.00	0.08	0.08	100.00	0.02	0.02	100.00	1.68	1.68	100.00
		B	1.76	1.76	100.00	-	-	-	2.63	1.74	66.16	2.19	1.83	83.56
	2 Rabbing	A	8.31	6.07	73.04	7.83	6.34	80.97	9.10	6.38	70.11	6.23	4.18	67.09
		B	1.46	1.46	100.00	-	-	-	1.74	1.74	100.00	-	-	-
	3 Sowing	A	-	-	-	-	-	-	-	-	-	-	-	-
		B	-	-	-	-	-	-	-	-	-	-	-	-
	4 Trans- planting	A	11.06	8.78	79.39	12.96	11.20	86.42	11.36	8.64	76.06	5.33	3.58	67.17
		B	10.44	8.20	78.54	-	-	-	10.18	8.27	81.24	11.79	7.86	66.67
	5 Inter culture	A	3.03	2.09	68.98	4.00	3.36	84.00	2.68	1.59	59.33	2.14	1.06	49.53
		B	2.03	1.78	87.68	-	-	-	1.97	1.84	93.40	2.41	1.52	63.07
	6 Harvest- ing & threshing	A	17.68	14.39	81.39	20.48	18.47	90.19	19.32	14.80	76.60	4.47	3.07	68.68
		B	13.50	11.68	86.52	-	-	-	14.28	12.63	88.45	9.47	6.79	71.70
	7 Total	A	40.35	31.59	78.29	45.35	39.45	86.99	42.48	31.43	73.99	19.85	13.57	68.36
		B	29.19	24.88	85.23	-	-	-	30.80	26.22	85.13	25.86	18.00	69.61
9 Fodder		A	11.56	11.56	100.00	9.54	9.54	100.00	12.87	12.87	100.00	11.11	11.11	100.00
		B	15.18	15.18	100.00	-	-	-	13.88	13.88	100.00	21.85	21.85	100.00
10 Hired bullock labour		A	1.86	1.72	92.47	2.13	2.00	93.90	1.92	1.73	90.10	1.01	1.01	100.00
		B	3.84	3.07	79.95	-	-	-	4.28	3.39	79.21	1.52	1.43	94.08
11 Permanent farm servants		A	15.32	6.17	40.27	16.88	6.62	39.22	15.85	6.49	40.95	9.53	3.83	40.19
		B	19.53	9.18	47.00	-	-	-	21.07	9.88	46.89	11.53	5.56	48.22
12 Total		A	142.06	93.31	65.68	194.48	145.04	74.58	126.18	76.23	60.41	81.33	39.07	48.04
		B	117.45	75.98	64.69	-	-	-	124.53	81.16	65.17	85.92	49.39	57.48

A = Participant

B = Non participant

Table 15 : SIZEWISE DISTRIBUTION OF THE TOTAL COST, CASH EXPENDITURE AND THE MATERIAL RECEIVED FREE FOR CERTAIN INPUTS

(Figures in Rs. per acre)

Item	Size group	Partici- pant or non parti- cipant	All crops			TN-1			Local paddy ¹			Other crops		
			1	2	3	1	2	3	1	2	3	1	2	3
			4	5	6	7	8	9	10	11	12	13	14	15
1 Seeds	0.01 to 1.00	A	19.57	8.48	8.76	21.76	8.12	10.82	20.00	20.00	-	0.48	-	-
		B	12.37	3.26	-	-	-	-	12.76	3.60	-	8.59	-	-
	1.01 to 3.00	A	15.42	5.98	2.41	23.04	14.63	6.72	12.08	1.19	-	7.13	0.81	-
		B	11.92	-	-	-	-	-	13.12	-	-	3.79	-	-
	3.01 to 5.00	A	14.99	4.76	2.33	23.44	15.41	7.79	13.35	0.27	-	4.56	-	-
		B	10.19	0.31	-	-	-	-	13.93	-	-	1.84	0.99	-
	5.01 & above	A	11.38	1.60	2.51	17.26	5.96	9.37	9.91	-	-	6.00	-	-
		B	9.24	-	-	-	-	-	7.75	-	-	24.16	-	-
	Total	A	14.30	4.47	2.49	21.90	12.83	7.76	11.93	9.58	-	5.76	0.28	-
		B	11.37	0.57	-	-	-	-	12.75	0.59	-	4.24	0.45	-
2 Fertilizer:	0.01 to 1.00	A	23.19	16.55	6.64	25.71	20.45	5.26	-	-	-	25.00	-	25.00
		B	2.01	2.01	-	-	-	-	2.22	2.22	-	-	-	-
	1.01 to 3.00	A	23.32	21.41	1.91	54.92	51.55	3.37	5.02	5.02	-	7.99	2.24	5.75
		B	10.92	10.92	-	-	-	-	12.47	12.47	-	0.44	0.44	-
	3.01 to 5.00	A	23.61	21.77	1.84	61.24	57.23	4.01	6.53	8.53	-	4.11	-	4.11
		B	12.51	12.16	0.35	-	-	-	17.62	17.62	-	1.14	-	1.14
	5.01 & above	A	14.86	13.12	1.75	34.95	29.93	5.02	7.74	7.74	-	6.41	3.25	3.16
		B	-	-	-	-	-	-	-	-	-	-	-	-
	Total	A	21.27	19.36	1.91	51.76	47.77	3.99	7.00	7.00	-	6.20	1.55	4.65
		B	9.07	8.99	0.08	-	-	-	10.70	10.70	-	0.70	0.18	0.51

1 = Total cost 2 = Cash expenditure 3 = Material received free

Table 15 : (contd.)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
3. Casual labour	0.01 to 1.00	A	30.48	30.48	-	34.35	34.35	-	28.00	28.00	-	-	-	-	
		B	19.09	19.09	-	-	-	-	21.06	21.06	-	-	-	-	
	1.01 to 3.00	A	28.97	24.74	-	36.26	32.96	-	27.11	22.44	-	15.38	10.27	-	
		B	23.28	19.79	-	-	-	-	26.05	22.17	-	4.49	3.64	-	
	3.01 to 5.00	A	49.32	36.83	-	54.20	44.40	-	54.91	39.23	-	20.65	14.10	-	
		B	58.77	45.00	-	-	-	-	62.00	49.51	-	51.58	34.95	-	
	5.01 & above	A	45.77	34.82	-	52.00	45.85	-	47.21	33.48	-	25.78	17.97	-	
		B	9.82	9.82	-	-	-	-	9.20	9.20	-	16.00	16.00	-	
	TOTAL		A	40.35	31.59	-	45.35	39.45	-	42.49	31.42	-	19.85	13.56	-
			B	30.00	24.87	-	-	-	-	30.80	26.21	-	25.85	17.99	-

Table 16: NUMBER OF CULTIVATORS USING THE DIFFERENT INPUTS OBTAINED THROUGH THE DIFFERENT SOURCES, IN THE SELECTED VILLAGES

I - Taichung Native-1

Item		Size group				Total
		0.01 to 1.00	1.01 to 3.00	3.01 to 5.00	5.01 & above	
<u>No. of cultivators</u>						
<u>(Total entries)</u>						
Total No. of selected cultivators	A	4	32	17	7	60
Using the home grown seed	A	1	6	1	3	11
Using the seed obtained free	A	2	10	6	5	23
Using the purchased seed	A	1	19	13	3	36
<u>Using Fertilizers</u>						
Obtained free	A	2	11	5	5	23
Purchased	A	1	23	14	5	43
<u>Using Cow-dung manure</u>						
Owned	A	4	27	16	4	51
Purchased	A	-	-	1	-	1
Paying Rent	A	4	31	17	7	59
Paying land revenue	A	-	9	5	3	17
Spending over fodder	A	-	12	12	5	29
Paying charges on hired bullocks	A	1	3	2	3	9
Maintaining farm servants	A	-	1	3	2	6

A = Participant

Contd.

Table 16 - Contd.

II - Local Paddy

		Size group				Total
		0.01 to 1.00	1.01 to 3.00	3.01 to 5.00	5.01 & above	
<u>No. of cultivators (Total entries)</u>						
Total No. of selected cultivators	A	4	32	17	7	60
	B	16	19	4	1	40
Using the home grown seed	A	-	27	15	7	49
	B	12	19	4	1	36
Using the seed obtained free	A	-	-	-	-	-
	B	-	-	-	-	-
Using the purchased seed	A	1	3	1	-	5
	B	4	-	-	-	4
<u>Using Fertilizers</u>						
Obtained free	A	-	-	-	-	-
	B	-	-	-	-	-
Purchased	A	-	5	7	3	15
	B	1	9	4	-	14
<u>Using Cow-dung manure</u>						
Owned	A	1	26	14	5	46
	B	11	18	4	1	34
Purchased	A	-	-	-	-	-
	B	-	-	-	-	-
Paying Rent	A	1	28	16	7	52
	B	12	19	4	1	36
Paying land revenue	A	-	8	3	3	14
	B	5	3	-	-	8
Spending over fodder	A	-	11	11	5	27
	B	-	8	3	-	11
Paying charges on hired bullocks	A	-	2	2	3	7
	B	10	1	1	-	12
Maintaining farm servants	A	-	1	3	2	6
	B	-	5	1	-	6

A = Participants
B = Nonparticipants

farm-produced seed for local paddy. The size-wise distribution of the costs over the local paddy seed (Table 15) indicates that the input was also the lowest in the largest size group as in the case of the TN-1 variety. The costs over the seeds for the other crops varied around Rs. 5 per acre for both groups of cultivators and generally the farm-produced seed was used.

Fertilizers

The cost over fertilizer for paddy TN-1 was around Rs.50 per acre (Table 14) and 92 per cent of this cost was incurred in cash, the remaining being met by the free fertilizer distribution for the nurseries. The cash expenditure over fertilizer for paddy TN-1 accounted for nearly one-third of the cash expenditure for the variety. As many as 23 of the 60 participants (Table 16) had received the free fertilizers for the nurseries. This number tallied with the number of cultivators receiving the seeds free. It meant that all those getting the free nursery seed were also given the free fertilizer without any discrimination though they were given the unweighed quantities as noted earlier. The size-wise distribution of the fertilizer input (Table 15) indicates that the input was the lowest viz. Rs. 25 per acre in the smallest size group (0.01 to 1.00 acre) and it increased to Rs. 61 per acre in the third size group. (3.01-5.00 acres). Thereafter it declined to Rs. 35 per acre in the largest size group.

The input of fertilizer for local paddy was only Rs. 7 per acre in the case of the participants and Rs. 10 per acre in the case of the nonparticipants. All the fertilizer was purchased in both cases. The input of fertilizers for paddy TN-1 was, thus, about 6 to 7 times the input of the same over local paddy. The size-wise distribution of the input of fertilizer for local paddy indicated the same trends as in case of paddy TN-1. The cost over fertilizer for the other crops was about Rs. 6 and Re. 1 per acre in case of the participants and the nonparticipants respectively. About one fourth of this input was obtained free under the scheme of free fertilizer distribution for ragi whereas the remaining was purchased for the cultivation of vegetables.

Organic manure

The organic manures used in the selected area were either dung or sheep fold. But these manures were being added only to the sites reserved for growing the seedlings and were being burnt for burning the soil and preparing the 'rab' or a layer of ash for sowing the seeds. The costs over cow dung in case of the participants were around Rs. 20 per acre for paddy TN-1, local paddy and the other crops (Table 14). They were a little lesser in case of the nonparticipants. The costs over sheep-fold in case of both the groups of cultivators varied from Re. 1 to Rs. 4 for the different crops. All the sheep fold was purchased whereas the cow dung used, was mostly produced on the farm. Only one of the 60 participants had purchased cow dung (Table 16).

Irrigation

Though this item forms an important item of expenditure in the other areas, no expenses were incurred on this item in the selected villages as paddy was being grown entirely as a rainfed crop in the selected district.

Land revenue and rent

The cash expenditure over revenue in the case of the participants came to Rs. 6.3 per acre for paddy TN-1 and Rs. 5.7 per acre for local paddy (Table 14). The cash expenditure over revenue for local paddy in case of the nonparticipants was, on the contrary, Rs. 6.8 per acre. This higher expenditure in the case of the nonparticipants may be due to the possession of the superior late soils for which the variety paddy TN-1 was not suited. The expenses over revenue for the other crops came to Rs. 1.5 to Rs. 2 per acre only in case of both groups of cultivators. The expenditure over rent for paddy TN-1 came to Rs. 15 per acre and that for local paddy to Rs. 7.2 per acre in the case of the participants and Rs. 8 per acre in the case of the nonparticipants. These variations in the rent showed exactly the same trends as in the case of land revenue. The rent for the other crops was Rs. 6 per acre. There were as many as 59 cultivators (Table 16) in a sample of 60 participant families, who were paying the land rent. As many as 36 cultivators in a sample of 40 nonparticipating families also belonged to this category. On the contrary, the number of cultivators paying the land revenue was much less. Though the proportion of leased in land was much less in the samples of the selected cultivators as noted in the earlier chapter, practically all cultivators possessed some land taken on lease.

Pesticides

Since the spraying was undertaken by the Home Guards and the materials required for spraying were supplied free under the nursery scheme, the farmers had not to incur any expenditure on this account. The bills for spraying were also not prepared by the time of these investigations and in case of any deficit the amount was to be recovered from the Gram-panchayats for these villages.

Casual labour and permanent farm servant

The costs over casual labour in case of the participants were Rs. 45 per acre for paddy TN-1 and Rs. 42 per acre for local paddy (Table 14). There was, therefore, not much difference in the costs over casual labour for the two varieties. The cultivators had, however, to incur larger expenses in cash for paddy TN-1 when compared to local paddy. This difference in the cash outlay was due to the larger requirements of labour for uprooting the seedlings while transplanting paddy TN-1 variety and threshing it after the harvest. The costs over casual labour for local paddy in case of the nonparticipants came to only Rs. 31 per acre. About 75 to 85 per cent of these costs for both groups of cultivators were met in cash and the remaining in the form of grains. The costs over casual labour for the other crops varied from Rs. 20 to Rs. 25 per acre for the two groups of cultivators. The distribution of these costs over the various items of cultivation in the same table would indicate that transplanting, harvesting and threshing accounted for a larger part of these costs. Sowing was usually done by the cultivators themselves and this item did not, therefore, involve any expenditure on the part of the cultivator. The size-wise distribution of the costs over casual labour (Table 15) indicates that the costs were the lowest in the smallest size-group and the highest in the third size group whereas they declined thereafter in the largest size group.

The cost over permanent farm servants came to about Rs.16 per acre for paddy TN-1 and local paddy in the case of the participants and Rs. 21 per acre for local paddy in the case of the nonparticipants (Table 14). Only 6 of the 60 participants and 6 of the 40 nonparticipants had, however, maintained farm servants (Table 16). These cultivators were distributed in all the size-groups except the smallest size-group.

Other inputs

In addition to the costs over the above inputs, some costs were incurred on hired bullock labour and fodder in case of both participants and nonparticipants. The costs over hired bullock labour were, however, quite meagre but the costs over fodder varied between Rs. 10 and Rs. 21 per acre (Table 14). A part of the cost over the hired bullock labour was paid in kind but the cost over fodder had to be met entirely in cash. Bullock labour had to be hired by only 9 participants and 12 nonparticipants distributed in all size groups (Table 16). Fodder had, however, to be purchased by as many as 29 participants and 11 nonparticipants distributed in all size groups except the smallest group.

Financing the outlays

After having noted the expenditures over the inputs an attempt is made here to note how those expenditures were financed. The per acre amounts borrowed through the different sources by the participants and the nonparticipants for the different crops, have been noted in Table 17. Out of the cash¹ expenditure of Rs. 121 per acre for paddy TN-1, nearly 40 per cent was obtained through the owned funds and the remaining was borrowed from the different agencies. The Cooperative Societies accounted for 97 per cent of the total borrowings for this variety and the remaining amount was borrowed through the private sources such as relatives, friends etc. The amounts expended by both participants and nonparticipants through the owned funds for local paddy nearly equalled the amount expended by the participants through the owned funds for paddy TN-1. This indicated that the cultivators in the selected villages could on an average spend Rs. 45 per acre for paddy cultivation irrespective of the variety. Nearly 94 and 87 per cents of the total borrowings for local paddy in case of the participants and the nonparticipants respectively were borrowed through the Cooperative Societies. The nonparticipants had obtained about 12 per cent of their borrowings through the private sources. About 90 per cent of the cash expenditure over the other crops in case of both participants and nonparticipants was financed through the owned funds. All the amounts borrowed for the other crops were obtained through the cooperative societies in the case of the nonparticipants whereas the participants had obtained 14 per cent of their borrowings for the purpose through private sources.

The size-wise distributions of the amounts borrowed and the number of cultivators borrowing the amounts through the different sources have been brought out in Table 18. The table indicates that the amount borrowed for paddy TN-1 was the least in the smallest size group whereas it went on increasing upto the third size group and declined in the largest size-group thereafter. In the second and the third size group the amount borrowed was about Rs. 80 per acre which was nearly double the amount borrowed by the farmers in the first size-group. The amounts borrowed for local paddy, however, did not follow this trend. The borrowings were the largest in the first size group; but they declined in the second and the third

¹ The cash expenditures noted in Table 17 include only the cash expenditures incurred and not the committed expenditures as in the earlier tables.

Table 17: PER ACRE AMOUNTS BORROWED THROUGH THE DIFFERENT SOURCES

(Figures in Rs. per acre)

Item		All crops	Taichung Native 1	Local paddy	Other Crops
Cash expenditure	A	76.15	121.16	61.00	30.12
	B	60.12	-	62.97	45.55
Of which amount financed through owned funds	A	43.61	46.67	46.18	26.04
	B	48.07	-	49.24	42.06
Proportion of amount financed through the owned funds to the cash expenditure (per cent)	A	57.27	38.52	75.70	86.45
	B	79.96	-	78.20	92.34
Total borrowings	A	32.54	74.49	14.82	4.08
	B	12.05	-	13.73	3.49
Borrowings from Co-operative Societies	A	31.42	72.64	14.07	3.24
	B	10.56	-	11.95	3.49
Proportion of borrowings through the Co-operative Societies to the total borrowings (per cent)	A	96.56	97.52	94.94	79.41
	B	87.63	-	87.04	100.00
Borrowing through the other agencies	A	0.04	-	-	0.28
	B	-	-	-	-
Proportion of borrowing through the other agencies to the total borrowings (per cent)	A	0.12	-	-	6.86
	B	-	-	-	-
Amount borrowed through other sources	A	1.08	1.85	0.75	0.56
	B	1.49	-	1.78	-
Proportion of amount borrowed through other sources to total borrowings (per cent)	A	3.32	2.48	5.06	13.73
	B	12.37	-	12.96	-

A = Participant

B = Nonparticipant

Table 18: SIZE-WISE DISTRIBUTION OF THE AMOUNTS BORROWED AND THE NUMBER OF CULTIVATORS BORROWING THE AMOUNTS THROUGH THE DIFFERENT SOURCES

Item	Size group					Total
	0.01 to 1.00	1.01 to 3.00	3.01 to 5.00	5.01 & above		
ALL CROPS						
<u>Borrowed funds</u>						
Total	A	83.70	2745.18	2174.25	1448.70	6451.83
	B	148.00	417.00	262.60	-	827.60
Amount per acre	A	31.89	36.03	31.48	28.74	32.54
	B	14.20	11.45	16.11	-	12.06
No. of families borrowing	A	2	26	15	6	49
	B	3	6	4	-	13
<u>No. of families reporting</u>						
<u>Borrowings from</u>						
Cooperative Societies	A	1	24	14	5	44
	B	1	6	4	-	11
Government	A	-	-	-	-	-
	B	-	-	-	-	-
Other Agencies or sources	A	1	4	2	1	8
	B	2	-	-	-	2
Total Entries	A	2	28	16	6	52
	B	3	6	4	-	13
PADDY TN-1						
<u>Borrowed funds</u>						
Total	A	76.70	2142.58	1666.00	859.50	4744.78
	B	-	-	-	-	-
Amount per acre	A	36.09	78.20	80.58	63.67	74.49
	B	-	-	-	-	-
No. of families borrowing	A	2	26	15	6	49
	B	-	-	-	-	-
<u>No. of families reporting</u>						
<u>Borrowings from</u>						
Cooperative Societies	A	1	24	14	5	44
	B	-	-	-	-	-
Government	A	-	-	-	-	-
	B	-	-	-	-	-
Other Agencies	A	1	2	2	1	6
	B	-	-	-	-	-
Total Entries	A	2	26	16	6	50
	B	-	-	-	-	-

A = Participant
B = Nonparticipant

Contd.

Table 18 Contd.

		Size group				Total
		0.01 to 1.00	1.01 to 3.00	3.01 to 5.00	5.01 & above	
<u>Borrowed funds</u>		LOCAL PADDY				
Total	A	7.00	522.00	500.19	568.40	1597.59
	B	148.00	377.95	262.60	-	788.55
Amount per acre	A	28.00	13.22	13.32	18.64	14.82
	B	15.66	11.90	23.34	-	13.73
No. of families borrowing	A	1	13	10	6	30
	B	3	6	4	-	13
<u>No. of families reporting</u>						
<u>Borrowings from</u>						
Cooperative Societies	A	-	11	9	5	25
	B	1	6	4	-	11
Government	A	-	-	-	-	-
	B	-	-	-	-	-
Other Agencies or sources	A	1	2	1	1	5
	B	2	-	-	-	2
Total Entries	A	1	13	10	6	30
	B	3	6	4	-	13
<u>Borrowed funds</u>		OTHER CROPS				
Total	A	-	80.60	8.06	20.80	109.46
	B	-	39.05	-	-	39.05
Amount per acre	A	-	8.67	0.74	3.25	4.08
	B	-	8.35	-	-	3.49
No. of families borrowing	A	-	5	2	1	8
	B	-	3	-	-	3
<u>No. of families reporting</u>						
<u>Borrowings from</u>						
Cooperative Societies	A	-	4	2	1	7
	B	-	3	-	-	3
Government	A	-	-	-	-	-
	B	-	-	-	-	-
Other Agencies	A	-	1	-	-	1
	B	-	-	-	-	-
Total Entries	A	-	5	2	1	8
	B	-	3	-	-	3

A = Participant

B = Nonparticipant

groups and went up again in the fourth size group. No specific trend could also be observed with the borrowings for the other crops.

The table would further indicate that out of the 60 participants, 40 participants had borrowed through the cooperative societies whereas 10 participants had borrowed through private sources for financing paddy TN-1. For local paddy, 25 of the participants had to borrow through the cooperative societies and 5 through the private sources. The proportion of borrowers in the group of the nonparticipants was much small. On the whole 52 of the participants and only 13 of the nonparticipants had to borrow various amounts for the purpose of cultivation.

Production from the new variety and local paddy

The size-wise distribution of the production per acre from paddy TN-1 and local paddy in the case of the participants and the nonparticipants in the selected villages has been brought out in Table 19. On an average the per acre production from paddy TN-1 in the selected villages was only 476 kgs. per acre whereas that from local paddy was 584 kgs. and 562 kgs. per acre in the case of the participants and the nonparticipants respectively. This clearly indicated that the variety was a total failure inspite of larger expenditures over the variety when compared to the expenditures over local paddy. Because of early flowering and neglect in the use of fertilizers, this high yielding variety produced much less than the local varieties. This failure was severe especially when the new variety was expected to yield three times the local varieties! There were yet a few cultivators who had obtained somewhat higher yields as the table itself would indicate. In village No. 1, for example, the per acre yields were 800 kgs. per acre and 700 kgs. per acre in the smallest and the largest size groups. Barring such few cases, the performance of the variety was quite poor. The new variety produced more than the local varieties on an average, only in village No. 3 wherein the yield from the local variety itself was lower. The average production per acre was much below the average production per acre from local paddy in village No. 2 and 4 whereas in village No. 3 the per acre production could be at least on par with the per acre production from local paddy. Because of the larger input of fertilizer in village No. 1, however, the per acre yield from the variety was the largest in this village when compared to all other villages.

Repayment performance of the participants and the nonparticipants

The quantities produced and sold and the amounts of loan repaid by the participants and the nonparticipants have been noted in Table 20. It would be observed from the table that the participants had upto the time of investigations, sold only 20.7 per cent of the produce from the variety TN-1 and 13.6 per cent of the produce from local paddy. The participants in the smallest size group being small holders, had not sold any produce whereas the sales were meagre in case of the participants in the second size group. The nonparticipants, had sold only 4.9 per cent of their produce.

These sales were made under the Government Scheme of monopoly procurement. There were 73 centres operated for this purpose by the State Marketing Society out of which 17 centres were managed by the District Sale and Purchase Union whereas the Union was supervising the work of the other centres. There was, however, no linking of credit with marketing and hence it was not possible to recover the loans through the sale proceeds of the borrowing cultivators. The total amount of loans which had

Table 19: PRODUCTION PER ACRE FROM PADDY TN-1 AND LOCAL PADDY IN THE SELECTED VILLAGES.

(Kgs. per acre)

		Size group				Total
		0.01 to 1.00	1.01 to 3.00	3.01 to 5.00	5.01 & above	
<u>Village No. 1</u>						
A	TN-1	800.00	511.11	435.29	700.00	523.36
	Local Paddy	-	515.51	564.10	466.67	529.60
B	Local Paddy	640.00	485.11	366.67	-	486.96
<u>Village No. 2</u>						
A	TN-1	-	502.50	476.58	360.00	461.00
	Local Paddy	-	632.43	750.00	629.63	676.19
B	Local Paddy	541.67	508.11	666.67	-	558.53
<u>Village No. 3</u>						
A	TN-1	46.67	557.39	505.26	458.82	500.66
	Local Paddy	-	461.33	459.60	463.16	461.51
B	Local Paddy	363.76	388.89	-	-	376.69
<u>Village No. 4</u>						
A	TN-1	65.00	355.34	458.18	200.00	327.10
	Local Paddy	600.00	490.43	864.00	666.67	625.99
B	Local Paddy	453.33	576.00	853.33	960.00	744.24
<u>Total</u>						
A	TN-1	188.24	500.00	480.05	466.67	476.06
	Local Paddy	600.00	524.81	662.32	567.21	584.88
B	Local Paddy	473.65	496.06	648.89	940.00	562.68

A = Participants

B = Nonparticipants

Table 20: REPAYMENT PERFORMANCE OF THE PARTICIPANTS AND THE NONPARTICIPANTS.

	Variety	Size group				Total
		0.01 to 1.00	1.01 to 3.00	3.01 to 5.00	5.01 & above	
<u>PARTICIPANTS</u>						
the Area under/variety (acres)	A	2-05	27-16	20-27	13-20	63-68
	B	0-10	39-20	37-22	30-20	107-32
Production Qty.(Kg.)	A	400	13700	9925	6300	30325
	B	150	21330	24870	17300	63650
<u>Sales</u>						
Qty. (Kg.)	A	-	2150	2357	1760	6267
	B	-	1000	3918	3770	8688
Value (Rs.)	A	-	1182.50	1294.25	966.50	3443.25
	B	-	598.00	2185.80	2200.00	4983.80
<u>To whom sold</u>						
Co-operative Society (Rs.)	A	-	-	-	-	-
	B	-	-	-	-	-
Government (Rs.)	A	-	1182.50	1294.25	966.50	3443.25
	B	-	598.00	2185.80	2200.00	4983.80
Others (Rs.)	A	-	-	-	-	-
	B	-	-	-	-	-
<u>Repayment of borrowing</u>						
Current borrowings	A	-	199.75	373.40	-	573.15
	B	-	-	-	-	-
Previous short-term borrowings	A	-	-	-	-	-
	B	-	-	-	-	-
<u>NON-PARTICIPANTS</u>						
the Area under/variety (acres)	B	9-18	31-30	11-10	5-00	57-18
Production Qty. (Kg.)	B	4476	15750	7300	4800	32326
<u>Sales</u>						
Qty. (Kg.)	B	-	350	634	-	1584
Value (Rs.)	B	-	570.00	380.40	-	950.40
<u>To whom sold</u>						
Co-operative society (Rs.)	B	-	-	-	-	-
Government (Rs.)	B	-	570.00	380.00	-	950.40
Others (Rs.)	B	-	-	-	-	-
<u>Repayment of borrowing</u>						
Current borrowings	B	9.00	78.50	113.40	-	230.90
Previous short-term borrowings	B	-	-	-	-	-

A = Taichung Native 1.

B = Local Paddy.

been repaid till the time of investigations, therefore, came to only Rs. 573 in case of the participants and to Rs. 230 in case of the nonparticipants even though these cultivators had received sale proceeds valued at Rs. 8427 and Rs. 950 respectively.

Economic performance of the new variety

It would be interesting to compare here the values of the per acre production from the two varieties with the cash expenditures and the total costs noted earlier. The value of the average production per acre for paddy TN-1 came to Rs.261 at Rs. 55 per quintal. The cash expenditures over the variety were Rs. 145 per acre and the total costs excluding the costs over family labour were Rs. 194 per acre. The value of the average production per acre for local paddy in case of the participants and the nonparticipants was on the contrary around Rs. 310 per acre with the cash expenditures and the total costs around Rs. 80 and Rs. 125 respectively. From these figures the cost benefit ratio for local paddy worked out to Rs. 1:2.48 whereas that for the TN-1 variety worked out to Rs. 1:1.34 only. This left a much small margin for the participants after growing such a high yielding variety when compared with local paddy. The values of the average production per acre, however, varied for the different villages and except for village No. 4, they were nearer the average for all the villages.

CHAPTER 5

SUMMARY AND CONCLUSIONS

Fixation of the target

Out of a total target of 1.95 lakh acres for paddy TN-1 in Maharashtra State, the target fixed for the selected district was 45,000 acres. This target was, however, evolved through various alterations in the decisions from time to time. Initially, the district was given a target of only fifteen thousand acres in the month of February, 1966 which was taken up to one lakh acres in the month of April. After discussions in the meetings within the district and between the district and the State officials, the target was reduced to 40,000 acres. While including this target under the Kharif Crop Campaign, however, it was raised again to 45,000 acres by the end of May. Half of this target was to be achieved under the normal scheme and the remaining half under the nursery scheme. The target under the normal scheme was to be achieved by supplying the seed and fertilizer to the cultivators through the cooperative societies whereas that under the nursery scheme was to be achieved by distributing the seedlings to the cultivators through the Grampanchayats. The seed and fertilizer required for the nurseries was to be supplied to the cultivators growing the nursery seedlings on behalf of the Grampanchayats.

One does not know whether the same procedures were adopted in fixing the targets for the other districts but one finding which emerges from the analysis of the data for the different districts is that the targets were not generally related to the areas under the crop in the different districts. It appears that the decisions about the targets for the different districts were based mainly on the negotiations between the State level and the district level officials as in the case of the selected district. The same procedures seem to have been adopted in passing on the district level targets to the blocks and therefrom to the agricultural assistant circles. The Agricultural Assistants in block No. 1 were given the freedom to decide the targets for the cooperative societies, Grampanchayats and the villages within their circles whereas those in block No. 2 had to implement the targets fixed from above for the Grampanchayat and the Cooperative Societies, though it was at their discretion to decide the targets in the individual villages within a Grampanchayat or a Cooperative Society.

Though the targets under the normal and the nursery schemes were to be achieved on a 50 : 50 basis as was the directive from the State, some of the blocks were given a larger target under the nursery scheme whereas the others under the normal scheme. It was not possible to ascertain the reasons for this distribution but it appears that the decisions about assigning a larger or a smaller proportion of the target under the nursery scheme involving free distribution of seed and fertilizer might have been based upon the responses of the farmers to purchasing the seed through the cooperative societies according to the initial programme. The nursery scheme was itself released through the State level quite late and it, therefore, appears that the district officials must have made use of the free distribution mainly to complete the achievement of the target for the distribution of seed in the different blocks.

Plans for the achievement of the target

The leaflets issued at the state level contained great many details about the programme and instructions for its

implementation. Even the duties to be performed by the staff at the various levels were thoroughly chalked out. The same instructions were followed at the district level. A coordination committee was also formed at the district level to decide the details about the implementation of the programme. Though coordination committees were not formed at the block level, the concerned officials worked together to achieve the target. Meetings were held in most of the villages and they were attended by even the block officials. It was, however, not possible to mobilize all the cultivators in a village through such meetings since the block officials had to attend to a number of villages. Moreover, the programme being spread practically over most of the villages and in all the corners of a block, it was physically impossible to mobilize a large number of cultivators through a single meeting. Attempts were yet made to disseminate the knowledge about the variety to those few who attended the meetings and it was expected that those who attended the meetings would further carry the knowledge to the other cultivators. Upto the block level thus, attempts were made systematically to introduce the variety in the area.

It was, however, decided earlier in the district meetings that the programme should be organized only through a few villages and a few cooperative societies and in blocks of 500 acres or so. These decisions, it seems, were not followed when the programme was implemented at the block level. In the blocks selected for the survey, for example, it was observed that the programme covered 53 of the 63 societies and 152 of the 167 villages in block No. 1 and all the 24 societies and 142 of the 147 villages in block No. 2.

The programme could not be, however, implemented properly when it reached the village level. According to the instructions from above, the supply of fertilizer to the cultivators was linked with the cultivation of the new variety. Those cultivators who wanted the fertilizer had, therefore, to agree first to grow the variety. Such compulsions were, however, defied in village No. 2 and 4. Fertilizer had, therefore, to be supplied later even to those who could not agree to try out the new variety.

Attempts were made in all villages to persuade the cultivators to purchase the seed through the society. Before the societies could distribute all the seed, the Agricultural Assistants were informed about their targets under the nursery scheme. The Grampanchayats did not own any land and hence the seed and fertilizer under this scheme had to be distributed among the individual cultivators free with the hope that they would grow the seedlings and supply them to the others at Rs. 15 per guntha. The nursery seed was, therefore, supplied even to those who had purchased the seed through the society. Moreover, as was observed in two of the villages, all the seed under the nursery scheme did not reach the cultivators even though the records maintained by the Agricultural Assistants showed a total achievement of the targets under this scheme. So also unduly large quantities of seed were given to some of the cultivators as in village No. 1, 2 and 4 when compared to the size of the holdings possessed by these cultivators. This might have been done with the hope that these cultivators would really supply the seedlings to the others. Not only that this hope never materialized but even some of the cultivators getting the free nursery seed did not sow the seed at all. In village No. 4, on the contrary, where the free nursery seed distribution preceded the distribution of seed through the society, the society could not sell a large part of the seed.

Part of the fertilizer under the nursery scheme also did not reach the cultivators as stated against their names in the records and it seemed to have been probably sold out by the Agricultural Assistants. The fertilizer was distributed without weighing it. The Agricultural Assistants complained that they had only small weighing balances which could not be used for distributing quantities above 4 kgs. and even if they were to distribute the fertilizer after weighing, the 50 kgs. bags of ammonium sulphate never contained the marked quantities. Such complaints were being made even by the district officials who had at times verified the actual contents of such bags.

Achievement of the target

The figures for the achievement of the target as we were supplied varied for the different sources. The state level figure for the 'area covered' under paddy TN-1 in the selected district was 39,000 acres whereas the District Agricultural Officer gave us a figure of 26,500 acres. The earlier figure was based on the quantity of seed supplied to the district through the State whereas the later figure was based on the quantity of seed supplied to the cultivators through the district officials. The Home-Guards were, however, entrusted with spraying all the area under paddy TN-1 in eight blocks for which the figures for 'area covered' had been reported to be 23,568 acres. The Agricultural department in the district informed us that all the area under the new variety in these blocks (viz. 23568 acres), was entrusted for spraying to the Home-guards. When the Home-guards, however, sprayed all the area, it came to be only 10,000 acres. If what these different agencies report about 'all the area' is correct, it appears that only an area of 10,000 acres or a little more might have been brought actually under paddy TN-1 in the blocks in which the area covered came to 23,568 acres. As against the total reported figure of achievement over 26,500 acres for the whole district, the area actually brought under the variety may therefore, be at the most of the order of 12 or 13 thousand acres only as the figures from these various sources indicate.

The village studies also confirm the above estimation. It was observed from the sample of the selected participants that the average seed input in their cases was 19 kgs. per acre. The village studies indicated that the seed rates worked out from the quantities of the seed distributed in the villages and the area under the variety, came to 25.6, 33.1 and 33.2 kgs. per acre in village No. 1, 2 and 4 respectively. It was not possible to work out a similar seed rate for village No. 3 in which a part of the seed used was produced on the farms during the summer. The average rate of supply of seed for the above three villages worked out to 29.5 kgs. per acre. From these figures it appears that the seed rate adopted by the cultivators was not at the rate of one bag of 10 or 15 kgs. per acre but much larger and the rate of supply of seed per acre was still larger. Since the reported achievements were based on the number of bags distributed the true achievement was likely to be much more low. It was noted in an earlier chapter that the total quantity of seed distributed in the district was 4287 quintals. On the basis of the rate at which the seed was supplied to the above three 'best' villages, the area under paddy TN-1 in the district can be estimated to be 14532 acres. But as the selected villages were the 'best' villages and the Home-guards had sprayed all the area in the blocks assigned to them, the above estimation of 12 to 13 thousand acres seems to be nearer the reality as against the figures for the achievement supplied through the district and the State. Again, it was observed earlier that the coverage reported by the Agricultural Assistants for the above mentioned three villages was

260 per cent of the areas actually brought under the variety in these villages whereas the same worked out to 180 per cent of the actual areas if the fourth village wherein the farm produced seed was used, is also taken into account. It, therefore, appears that the figures reported by the Agricultural Assistants for the areas brought under the new variety were nearly double the areas actually brought under it. Only one-third of the achievement reported by the State and a half of that reported through the district seems to have been thus, really achieved.

Response of the farmers and the factors influencing it

As only the 'best' villages in the 'best' blocks were selected for this survey, it was natural that the farmers should be found to have given a high response for the programme. In village No. 3, where the variety was grown earlier during the summer, as many as 83 per cent of the paddy cultivators had participated in the programme. In village No. 1 where the supply of fertilizer was strictly linked with the cultivation of the variety and which was a village in which the Vice-Chairman of the Panchayat Samiti was staying, the response was again quite high and 61 per cent of the cultivators had participated in the programme. In village No. 4 in which the nursery programme was undertaken on a large scale and in which the quantum of the nursery seed far exceeded the quantum sold through the society, there was also a good response and 34 per cent of the paddy cultivators including those belonging to the tribal communities had participated in the programme. In village No. 2, on the contrary, the cultivators defied the linking of the fertilizer supply with the cultivation of the new variety and only 12 per cent of the cultivators tried out the variety. The seed supply was also delayed in this village. In spite of these various favourable and unfavourable conditions, it is, however, interesting to note that a few of the cultivators in three of the four villages had obtained seed through their friends and relatives to try out the new variety. A cultivator from the tribal community in village No. 4 had borrowed the seed from another cultivator in the village getting the free nursery seed, at 25 per cent rate of interest. Such cases showed that apart from the compulsion resulting from the linking of the fertilizer supply with the cultivation of this variety or the attempts to induce the farmers to grow it through the free supply of inputs, there was a group of cultivators including even the small cultivators, which was very sincere in trying out the new techniques.

It was quite obvious that the extent of participation should be quite large in the upper size groups when compared to the lower groups. In the first two groups upto one acre, only 10 per cent of the cultivators had participated in the programme whereas the percentage went up gradually to 80 per cent in the upper size groups. The proportion of the small farmers participating in the programme was also larger in those villages in which the proportion of participating cultivators was itself large.

The tenurial status of the cultivators had no relation to their participation in the programme in this district since the right to own the land was guaranteed after the payment of the compensation to the owners by instalments. All the tenants in the district were, therefore, as good as the owners of the land they cultivated. The facilities for irrigation had also no relevance to the participation in the programme in the kharif season as the entire kharif crop was rain-fed. Some of the nonparticipants who were possessing the irrigated lands had,

however, planned to grow the variety with the help of the assured water supply in the rabi season after noting the results for the variety grown by the participants in these villages in the kharif season.

The employment of the male heads of the families outside the village which is a characteristic of the southern part of the selected district had, however, influenced considerably the participation in the programme irrespective of the size of the holding. It was observed that the proportion of such families among the participants was only 8 per cent whereas 45 per cent of the families of the nonparticipants belonged to this category.

The participants in the smaller size groups had devoted a larger proportion of their holdings for the new variety when compared to the cultivators in the larger size groups. This was obvious since every cultivator who wanted to try out the variety had to devote a minimum area to the variety, which in the case of the small farmers meant a larger proportion of their holdings when compared to the holdings of the large farmers.

Distribution of the seed and its use

As only a few farmers in a few villages in the district had their own TN-1 seeds produced on the farms during the summer, most of the seed had to be supplied through the Agricultural Department. The total quantity obtained for the purpose was 5782 quintals out of which nearly 55 per cent was bought from Andhra Pradesh and the remaining was procured locally. Out of this, only 74 per cent could be distributed and the balance remained with the co-operative societies, blocks and the District Sale and Purchase Union.

Not all the three fourths of the seed distributed for the programme could, however, reach the soil. A number of factors contributed to this result. The seed being packed in 10 and 15 kgs. bags, meant for sowing over an acre, those who wanted to try out the new variety only on a fraction of an acre, had to purchase one full bag and use only a part of its contents. Secondly, the fertilizer supply in two of the villages being linked with the purchase of the TN-1 seed through the societies, the cultivators desiring to purchase fertilizer for local paddy had to purchase the TN-1 seed merely to secure the fertilizer for local paddy. Thirdly, a part of the free nursery seed was not sown by the farmers but was consumed. Fourthly, in one village, the Agricultural Assistant himself had not distributed all the seed that was entered in his record as having been distributed. In the other villages also one suspected such cases but it was not possible to verify this fact. Fifthly, in a hurry to distribute the nursery seed or on purpose, a number of farmers had been given quantities of seed which together with the quantities they had purchased through the societies, far exceeded the quantities they needed to bring their entire holdings under the variety.

The nursery programme proved, thus, to be the main factor responsible for the wastage of the seed. The whole objective of the free nursery seed distribution appeared to have become fictitious. In fact the programme of nursery seed distribution itself was faulty in conception. It implied as if the farmers were unable to raise the seedlings on their own farms and that they would make up their minds to grow the new variety instead of the local one only at the time of transplanting, reject their own seedlings of the local variety grown on their farms and purchase the seedlings of the high yielding variety at the

eleventh hour at the rate of Rs. 15 per guntha of the seedlings, as envisaged in the scheme. Nowhere such an objective could materialise and those getting the nursery seed used only that part of the holding under the new variety, which they had planned for themselves.

Distribution of fertilizer and its use

The total quantity of fertilizer supplied by the District Sale and Purchase Union during the season was 6541 M. Tons. The District Agricultural Department had, however, estimated a requirement of 14 thousand M. Tons for the district. As against these estimates the district was supplied with 11.1/2 thousand M. Tons of fertilizer out of which only a little more than half could be distributed through the societies. This was, however, inevitable since the earlier estimates were based upon the complete achievement of the target whereas even less than a third of the target was actually achieved. Secondly, a number of societies were declared as the defaulter societies and in some of the other societies a number of members had committed a default. Such cultivators were, therefore, not eligible for borrowing the fertilizer through the society though they had obtained the seed under the nursery scheme. It was not, therefore, possible for the societies to lift up any additional quantities of the fertilizer.

The bulk of the fertilizer was supplied in the month of June. It being difficult to supply fertilizer to the interior areas during the monsoon, whatever stock that was available was moved to the interior in the month of May or the beginning of June. A stock of about 4082 M. Tons, therefore, remained with the District Sale and Purchase Union after the end of October even though there was a demand for fertilizer for local paddy. Moreover, those cultivators growing only the local paddy could not obtain the required quantities of fertilizer in some cases because of the linking of the fertilizer distribution with the cultivation of the new variety.

The input of fertilizer was also low as noted in the earlier chapter. The selected participants had used fertilizer worth Rs. 51 per acre for paddy TN-1 as against a recommended dose of fertilizer worth Rs. 95 for the variety. It must be mentioned here that the dose recommended in this district was itself somewhat low, it being 30 kgs. of nitrogen even though the variety had given the best response at a dose of 60 kgs. of nitrogen per acre. A reduction in the dose was attempted only because of an anticipated scarcity of fertilizer in the State. In the leaflet over the variety issued through the Agricultural Department for the State, the dose recommended was 40 kgs. of nitrogen per acre. The Agricultural Department for the district, however, recommended only 30 kgs. of nitrogen per acre costing Rs. 95 per acre along with the dose of phosphate. In fact, however, many of the cultivators reduced the dose further and the crop had to be grown at lower doses even though experimentation had indicated, as noted in Chapter 1, that at a lower dose the variety did not give more response when compared to the local varieties.

The cultivators having holdings between one and five acres had used fertilizer worth Rs. 50 to Rs. 65 per acre whereas in case of the cultivators below 1 acre, the per acre input was Rs. 30 or even less. In the case of the cultivators having holdings above 5 acres, the input had again declined to Rs. 35 per acre. Compared to the input of fertilizer for local paddy, which was only Rs. 7 to Rs. 10 per acre, the cultivators had used larger doses for paddy TN-1.

There was, however, no relationship between the supplies of fertilizer to the cultivators and their actual inputs. In village No. 1 for example they were supplied fertilizer worth Rs. 69 per acre whereas when compared to the actual area devoted to the variety, the supply worked out at Rs. 127 per acre. The sample of the selected participants, however, showed that the input of fertilizer in this village was Rs. 100 per acre. As far as village No. 1 was concerned the fertilizer was used quite adequately. In village No. 2, the cultivators growing the TN-1 variety were supplied with fertilizer at the rate of Rs. 92 per acre. The sample of the selected cultivators indicated that the input was only Rs. 66 per acre. In village No. 3 and 4, however, the rate of fertilizer use for the TN-1 variety came to only Rs. 31 and Rs. 28 per acre respectively in the case of the selected participants. The cultivators in both these villages were supplied with fertilizer at higher rates but a part of it was used for local paddy and a major part must have been reserved for the vegetable cultivation during the summer. Both the villages had a larger acreage under irrigation, and vegetable cultivation was a profitable business for the farmers.

As in the case of distribution of seed for the nursery, a part of the fertilizer meant for this scheme did not reach the cultivators as already noted earlier.

The use of pesticides

The Home Guards played a major role in spraying the pesticides for the variety in eight of the fourteen blocks in the district. The area could be, however, covered fully only during the first spraying whereas the programme had to be abandoned while the second spraying was in progress. The Home Guards were handicapped because of the short supply of petrol and hence their parties could not complete the daily turnovers assigned to them. There was also some resistance from the farmers to spraying the crop because of early flowering. The Home Guards had, therefore, to discontinue the spraying as the whole programme was proving to be uneconomic. The Home Guards could spray a gross area of only 15,000 acres during the two sprayings and they had to incur an expenditure of Rs. 32,000 over the allowances of the Home Guards engaged in spraying. The cost of labour over spraying, therefore, came to only Rs. 2.1 per acre. Since it was not possible to know the quantities of materials used for the spraying, it is not possible to determine the total cost over spraying.

The work done by the Home Guards was, however, appreciated by the villagers and there was a demand from the cultivators for organizing such programmes even in the future. The organisation was also prepared to undertake spraying in the ensuing years if it was to be given full control over the scheme or if it were to receive the fullest coordination from the Zilla Parishad in the matter of making available all the requisites including petrol at the spraying sites.

The demand for credit and disbursement

As decided in the meeting of the Coordination Committee at the district level, the preparation of Normal Credit (N.C.) Statements for paddy TN-1 was started in the first week of May itself and the Bank received 306 N.C. Statements by the 1st of June. A large number of defaulter members were also included in these statements. Out of these statements the Bank sanctioned 222 statements and rejected 84 statements. Only 12,400 members planning to grow the variety over 14,400 acres were included in these sanctioned statements. The

amount sanctioned was Rs. 42.59 lakhs and the State Cooperative Bank, therefore, sanctioned a credit limit of Rs. 50 lakhs to the District Bank for the purpose.

Out of this amount, the cultivators could, however, lift up an amount of Rs. 4.85 lakhs only as they had already received their requirements of cash through the earlier N.C. Statements prepared for Short Term and J.M.P.C. loans. Their requirements of seed and fertilizer were also satisfied either against the N.C. Statements prepared earlier or through the hurried supplies of these inputs made to them without the execution of bonds. Though the bonds were later executed in the villages in Block No. 2, they had not been executed in Block No. 1 even by the time of these investigations.

The per acre cash expenditures over seed, fertilizer and the other items of input and the expenditures incurred over these items through the borrowed funds for paddy TN-1 and local paddy in case of the participants and the nonparticipants have been summarized in Table 21. The details for the different size groups have been given for the participants whereas only the totals have been noted for the nonparticipants in this table for the convenience of the analysis. Though the participants were classified into broad size groups in Chapter 4, they have been further classified into narrower groups in this table to note the magnitude of variations even in the case of the smaller groups.

The study of the selected participants indicated that the cultivators were more in need of seed and fertilizer than cash for the cultivation of paddy TN-1. Out of a total cash expenditure of Rs. 145 per acre over paddy TN-1 (Table 21), the seed and fertilizer accounted for Rs. 60 or 42 per cent of the cash expenditure and the remaining items accounted for Rs. 84 per acre. In case of local paddy the remaining items of expenditure accounted for Rs. 68 and Rs. 69 per acre in case of the participants and the nonparticipants respectively. There was, thus, a difference of only Rs. 15 or Rs. 16 per acre in the requirements of cash for these other items of cash expenditure over paddy TN-1 and local paddy. Since the farmers had devoted on an average only 1.06 acres or 33 per cent of their average holding of 3.17 acres to the cultivation of paddy TN-1 in the kharif season, the additional cash requirements for growing paddy TN-1 were on an average meagre. If one is to calculate such differences of cash expenditures over the other items for the different size groups as in Table 21, one would find that the additional requirements for paddy TN-1 in relation to the requirements of local paddy in case of the participants varied from Rs. 17 to Rs. 30 per acre in the II, V, VI and VII groups, whereas the additional requirement was only Rs. 11 per acre in the IV group but Rs. 50 in the III group. Except for the III group, the maximum additional requirement of cash for the other items for paddy TN-1 was Rs. 30 only in the other groups. Even in village No. 4, where the defaulters who had received the seed for the nursery but could not receive the fertilizer through the Society, suffered more on account of the refusal for the fertilizer than for the cash.

It would be interesting here to compare the rates at which the finance was to be sanctioned by the Bank for the various items of expenditure over paddy TN-1 and the actual expenditures incurred by the participants over them through the borrowed funds. These rates of finance, the actual expenditures and the expenditures financed through the borrowed funds for paddy TN-1 have been summarized in Table 22.

Table 21 : CASH EXPENDITURE OVER SEED, FERTILIZER AND THE OTHER ITEMS AND THE AMOUNTS FINANCED THROUGH THE BORROWED FUNDS IN CASE OF THE PARTICIPANTS AND THE NON-PARTICIPANTS

Size group	Partici- pants or Non- partici- pants	Cash expenditure over seed (Rs. per acre)			Cash expenditure over the seed financed through borrowed funds (Rs. per acre)			Cash expenditure over fertilizer (Rs. per acre)		
		Paddy TN-I	Local Paddy	Difference between the expenditures over the two varieties	Paddy TN-I	Local Paddy	Paddy TN-I	Local Paddy	Difference between the expenditures over the two varieties	
1	2	3	4	5	6	7	8	9	10	
0.01-0.50	A	-	-	-	-	-	-	-	-	
0.51-1.00	A	10.62	20.00	9.38*	10.62	-	26.74	-	26.74	
1.01-2.00	A	20.61	-	20.61	20.60	-	61.44	5.25	56.19	
2.01-3.00	A	12.96	1.49	11.47	11.55	0.85	48.77	4.96	43.81	
3.01-4.00	A	16.32	0.47	15.85	16.32	n0.47	60.82	13.09	47.73	
4.01-5.00	A	14.66	-	14.66	14.66	-	54.29	2.56	51.73	
5.01 and above	A	5.96	-	5.96	5.96	-	29.93	7.74	22.19	
TOTAL	A	12.83	0.58	12.25	12.23	0.34	47.77	7.00	40.77	
	B	-	0.59	-	-	0.45	-	10.70	-	

A = Participants

B = Non-participants

* The difference is negative.

Table 21 : (contd.)

Size group	Partici- pants or Non- partici- pants	Cash expenditures over fertilizer financed through borrowed funds (Rs. per acre)		Cash expenditure over the other items (Rs. per acre)			Cash expenditure over the other items financed through borrowed funds (Rs. per acre)	
		Paddy TN-I	Local Paddy	Paddy TH-I	Local Paddy	Difference between the expenditures over the two varieties	Paddy TN-I	Local Paddy
		11	12	13	14	15	16	17
0.01-0.50	A	-	-	2.00	-	2.00	-	-
0.51-1.00	A	26.82	-	67.69	36.00	31.69	9.87	28.00
1.01-2.00	A	61.44	5.25	96.84	46.87	49.97	6.83	1.26
2.01-3.00	A	48.77	4.96	64.41	52.57	11.84	14.87	9.07
3.01-4.00	A	60.81	13.08	127.32	110.10	17.22	12.23	10.79
4.01-5.00	A	54.31	2.56	71.29	43.25	28.04	2.81	1.20
5.01 and above	A	29.92	7.74	97.27	75.83	21.44	27.77	10.89
TOTAL	A	47.77	7.00	84.44	68.65	15.79	14.06	8.20
	B	-	8.35	-	69.87	-	-	4.91

Table 22: RATES OF FINANCE, ACTUAL EXPENDITURES AND EXPENDITURES FINANCED THROUGH THE BORROWED FUNDS FOR PADDY TN-1

Item	Rate of finance by the Bank (Rs. per acre)	Total cash expenditure (Rs. per acre)	Cash expenditure financed through the borrowed funds (Rs. per acre)
1 Fertilizer	145.00	47.77	47.77
2 Seeds	20.00	12.83	12.35
3 Pesticides	35.00	-	
4 Cash over other items	100.00	84.44	14.06
5 Total	300.00	145.04	74.18

The cash expenditure incurred over fertilizer for paddy TN-1 was only Rs. 47 per acre and all the amount over this item was financed through borrowed funds. An amount of Rs. 145 was, on the contrary, to be made available per acre for the fertilizer even though the District Agricultural Department had recommended the use of fertilizer worth Rs. 95 per acre at 30 kgs. of nitrogen per acre. This recommendation of the Agricultural Department, however, did not include the amount of subsidy of Rs. 7.5 per acre for manure mixtures under the kharif crop campaign if a cultivator was to use only the manure mixture. If, however, the cultivators were to be recommended fertilizer at 60 kgs. of nitrogen, the cost would have come to Rs. 150 per acre. The participants in village No. 1 had already used fertilizer worth Rs. 99 per acre. There was, therefore, some overestimation of the per acre requirements of finance for this district for which the Agricultural Department had recommended a lower dose of nitrogen.

An amount of Rs. 20 was to be made available to the cultivators for purchasing the seed. Though the selected participants had spent less on this account, it was due to the free supply of seed and the use of the home-grown seed in village No. 3. Otherwise the amount sanctioned by the Bank would have been actually needed as the seed rate adopted was somewhat high when compared to the normal seed rate of 10 to 15 kgs. per acre. An amount of Rs. 35 was to be made available for the pesticides but as the crop was sprayed through the Home Guards and a larger part of the materials was made available under the nursery scheme, there was no need for any expenditure on this account on the part of the farmers. Moreover, the accounts being not yet finalised it is not possible to comment on the requirements of loan for this purpose. The cost over labour for spraying through the Home-Guards, however, was Rs. 2 per acre per spraying.

The cultivators were to be made available a cash loan of Rs. 100 per acre and this amount would have been really needed if a cultivator was to finance his requirements of cash solely through the borrowed funds. As a matter of fact, only 16.6 per cent of the cash expenditure over items other

than seed and fertiliser for paddy TN-1 was incurred by the participants through the borrowed funds. In case of the nonparticipants the proportion over the same in case of local paddy worked out to 7.0 per cent. If we determine the per acre expenditure in cash incurred over the other items through the borrowed funds as in Table 21, we find that the participants were on an average in need of cash of only Rs. 14.06 per acre for paddy TN-1 and Rs. 8.20 for local paddy. If we work out similar figures for the different size groups we find that the expenses per acre over items other than seed and fertilizer financed through the borrowed funds in case of paddy TN-1 varied from Rs. 6 to Rs. 27 per acre in the different groups. It is only in the 4.1 to 5.00 acre group that such expenses came to only Rs. 3 per acre. In case of local paddy in case of the participants, the per acre expenditures over the other items financed through the borrowed funds were around Rs. 10 in the IV, V and the VII groups whereas in the II and the VI groups the figure came to Rs. 1.20 per acre only. It is only in the second group that a larger expenditure of Rs. 28 per acre on this account had been financed through the borrowed funds. Even though the Bank was prepared to finance the cultivation of paddy TN-1 with a cash component of Rs. 100 per acre, the maximum cash component required in any size group of the participants was not more than Rs. 28 per acre with the average at Rs. 14.06 per acre only. It must be, however, noted that paddy TN-1 was neglected in certain cases because of early flowering and hence under the normal conditions this maximum might have gone up perhaps to Rs. 50 per acre.

It may, thus, be concluded that the rate of finance adopted by the Bank proved to be somewhat high because of the recommendation of a smaller dose of fertilizer for the district for this variety. The rate of finance for the seed, was, however, adequate but it also depended upon the price of the seed. A larger part of the seed for the programme being procured from Andhra Pradesh, the price of the seed was somewhat high, it being Rs. 115 per quintal. With the locally procured seed, however, the price may not go beyond Rs. 75 per quintal and hence a finance of Rs. 15 per acre would prove to be adequate even at a higher seed rate of 20 kgs. per acre. No comments can be made on the requirements of finance for the pesticides as the accounts for the programme over spraying were not finalized by the time of this survey. The cash component of the rate of finance by the Bank, however, proved to be quite high as there was only a small difference in the requirements of cash for items other than seed and fertilizer for the two varieties and a larger part of this expenditure was financed through the owned funds.

It was noted earlier that casual labour accounted for about 47 per cent of the expenditure over paddy TN-1, excluding the expenditure over seed and fertilizer. So also the processes of transplanting and harvesting and threshing accounted for most of this expenditure. It was in fact difficult to get hired labour for the processes of transplanting and harvesting which had a high seasonal importance. Moreover, the number of landless families in all these villages being itself insignificant except in village No. 3, as noted in Chapter 3, it reduced the supply of hired labour considerably. The cultivators had, therefore, to attend to the processes mainly with the help of family labour or labour from the other families on an exchange basis. This reduced considerably the cash expenditures over paddy cultivation.

It is also necessary here to comment upon the nature of the sample of villages selected. Since the selection of the villages was based on the performance of the variety and the

success of the programme, the villages selected from Block No.2 happened to be those having irrigation facilities and growing the vegetables. Since vegetable cultivation during the summer provided the necessary finance for cultivation of paddy in the kharif season, it is likely that this factor must have influenced the proportion of cash expenditure incurred through the owned funds in the sample of villages. So also in the villages selected from Block No. 1, a number of persons were employed outside the district. The expenses over cultivation must have been, therefore, partly financed through their remittances to these villages. This was, however, a common feature of the southern part of the selected district. Moreover, the number of families having the male members employed outside, being itself quite small among the participants, it must have had only a little influence over the financing of paddy TN-1 through such remittances and owned funds. The average cash expenditure of Rs. 28 per acre for the different size groups financed through the borrowed funds as mentioned above, may not, therefore, cross the limits of say, Rs. 25 and Rs. 50 per acre respectively even if the village in Block No. 2 were to be replaced by other villages.

The role of the different agencies participating in the programme and the nature of coordination

The agencies participating in the implementation of the programme as noted earlier were the Zilla Parishad, the District Bank, the District Sale and Purchase Union and the Home Guards. Though attempts were being made by these different agencies for proper coordination of their roles in the implementation of the programme, complete coordination could not be achieved. At the lower level, for example, there was no coordination between some of the Agricultural Assistants and the Secretaries of the Cooperative Societies in the distribution of seed under the nursery scheme. In village No. 4, therefore, even the defaulter members were given the nursery seed whereas they could not get fertilizer from the society. In village No. 1, the nursery seed was, on the contrary, given only to those cultivators who had purchased the seed from the society whereas in village No. 2 and 3, the nursery seed was given to the nondefaulter members only.

At the higher level the District Bank and the District Sale and Purchase Union could not frame a coordinated action programme. The District Sale and Purchase Union hurriedly supplied the fertilizer to the societies which was distributed without the execution of bonds. The District Central Bank did not care to get such bonds executed even though finance had been sanctioned to some of the societies under the paddy TN-1 programme. The Bank, thus, avoided any greater involvement in the programme by taking over the recovery of the cost of seed and fertilizer supplied by the District Sale and Purchase Union, by converting this cost into a loan. As a result it appeared as if the District Sale and Purchase Union had performed the function of the Bank by supplying materials to the cultivators on credit.

Mention has been already made above of the lack of coordination between the Home Guards and the Zilla Parishad in respect of the programme of spraying. This was, however, partly inevitable since it was not possible for the Zilla Parishad to hand over the finance for the purchase of petrol to the Home Guards as it was a non-Governmental body. Moreover, it would have been possible to achieve coordination in this respect if the blocks were to make arrangements for supplying petrol to the Home Guards at the spraying sites through their own staff. The programme being, however, hurriedly framed it was difficult to make proper arrangements for the different agencies to achieve full coordination.

Staffing pattern and the expenditure over the programme

Since the programme was undertaken in those blocks in which the Scheme for Intensive Cultivation of Food Crops was undertaken, there was no need for any special staff for the programme. Under this scheme which was being implemented in ten Blocks, one Agricultural Officer and ten Agricultural Assistants were available for each block. The total staff available directly for implementing this programme, therefore, consisted of 10 Agricultural Officers and 100 Agricultural Assistants. In addition to the High Yielding Varieties Programme, this staff was expected to introduce the improved methods of cultivation even for local paddy and the other food crops such as Ragi and Vari. All the members of this staff had, however, completed their education in agriculture through the Agricultural Schools after completing the VII standard in vernacular. Moreover, out of the technical staff of 141 officers and assistants in the district as in the month of January 1967, only two officers at the district level were graduates in agriculture whereas all the others had completed their education only through the Agricultural Schools.

There are certain difficulties in determining the expenditure over the programme because of the problems of allocating the expenditures over certain items. It is, however, possible to get some idea about such expenditures through making certain assumptions. The expenses over this programme were incurred under the Kharif Crop Campaign which was a plan scheme. An amount of Rs. 200 per acre was granted for preparing the paddy nurseries. Since one acre of nursery was sufficient for planting the seedlings over 10 acres, the cost of achieving the nursery target over 10 acres came to Rs.200. The district was even allocated Rs. 4.50 lakhs for this purpose but since the target achieved under the nursery scheme was only 10,420 acres, it meant as if the nurseries were prepared on 1042 acres and the district had, therefore, to draw an amount of Rs. 2.08 lakhs only through the amount allocated. In addition to this amount a subsidy was operated at the rate of Rs. 50 per ton for the use of the fertilizer mixture. The quantity of fertilizer mixture distributed was 1777 M. Tons but since the mixture must have been used also for local paddy, it can be assumed that only 1000 tons of fertilizer mixture was used for paddy TN-1. With this assumption it means that an amount of Rs. 0.50 lakh was spent for the subsidy over fertilizer mixture for paddy TN-1. The amount of funds allocated to this district for seed treatment was Rs. 7,000. As all the seeds were treated earlier before distribution, it meant that the full expenditure was incurred over this item irrespective of whether all the seed could be distributed or not. The total expenditure for the programme under the Kharif Crop Campaign thus came to Rs. 2.65 lakhs. The Home Guards had spent an amount of Rs. 0.32 lakh over spraying and the materials were obtained under the nursery scheme. This means that the direct expenditure for the programme came to Rs. 2.97 lakhs or Rs. 22.8 per acre for bringing an area of 13,000 acres under the variety.

It is difficult to determine the expenditure over the staff for this programme. If we, however, assume that an Agricultural Assistant was on an average paid Rs. 120 per month and an Agricultural Officer at Rs. 200 per month, the cost over the staff directly concerned with this programme would be Rs. 1.68 lakhs for a period of 12 months or Rs.12.9 per acre. Even though this staff had been assigned duties for the extension of improved practices for local paddy and ragi, the major work entrusted to the staff was implementing the target under the High Yielding Varieties Programme. It would

not be, therefore, wrong to say that the cost over the staff for this programme was Rs. 12.9 per acre. This cost would not include the expenditure over the staff at the district level. It can be therefore said that roughly the average cost of implementing the programme in the selected district came to about Rs. 35 per acre.

The success of the programme

The success of the programme needs to be examined from the point of its three dimensions viz. those of organization and implementation, productivity and acceptance. The parts relating to organization and implementation of the programme were already summarized and it was observed that though the problems of organization and implementation had been well thought out upto the district and block levels, the programme could not be implemented properly at the village level. Moreover, the objectives visualized in framing the nursery scheme or in giving preference for paddy TN-1 in the distribution of fertilizer could not be achieved because of misinterpretation of the objectives in these schemes at the lower level. This resulted in a bad implementation of the whole programme. Cases of non-coordination have been also mentioned in the earlier pages.

The programme also suffered because of the failure of the monsoon at the time of transplanting the crop. The crop flowered much early than the expectations and in certain cases the flowers appeared when the crop was in the nursery stage. This had an impact on the intercultural operations and the use of fertilizer especially in the northern part of the district. Some of the cultivators in this area, as we were told, did not transplant the crop. Though the variety was found to be not very photo-sensitive, from the trials at the different experimental stations, it was observed that it was highly thermo-sensitive. This meant that though the variety would not resist flowering any time during the year, it flowered much earlier when it received maximum thermal units. When grown in the month of May it was found that it matured only within 50 to 60 days. The variety received maximum thermal units in the month of July in the selected district as the monsoon had disappeared for some time. Coupled with inadequate nutrition in the nurseries, this disturbed the balance of C : N ratio in the plants and it resulted in early flowering / by the Paddy Specialist for the State.

Though the variety was found to have been given yields varying from 2030 to 2101 kgs. per acre at the experimental farms, the average yield obtained by the selected participants came to 476 kgs. only. The participants and the nonparticipants could get on the contrary 584 and 562 kgs. of paddy per acre from the local varieties. These yields, however, varied from one village to the other. The average yield was the largest viz. 523 kgs. per acre in village No. 1 where the input of fertilizer was also the largest among the four selected villages whereas it was the least viz. 327 kgs. per acre in village No. 4 where the input of fertilizer was also the least. In some of the size groups as in village No. 1, the yield was somewhat high viz. 800 kgs. per acre. But in no case did the variety produce 2000 kgs. per acre as on the experimental farms. The yields obtained at the experimental farms were, however, at a dose of 60 kgs. of nitrogen per acre whereas the Department had recommended a lower dose to the cultivators as noted earlier.

It would be interesting to note here the net additions to the production and the costs through growing paddy TN-1 instead of local paddy. Through growing the TN-1 variety the / as mentioned in one of the notes prepared on early flowering

participants on an average received Rs. 50 worth of production per acre less than by growing local paddy. There was on the contrary a net addition to the cash expenditures and the total costs (excluding the cost over family labour) by about Rs. 65 and Rs. 70 per acre respectively. The Government had spent Rs. 35 per acre over extending the variety. There was, thus, a net loss of about Rs. 150 per acre for the farmers and the Government together with a net loss of total output in the district in the year 1966-67 through extending paddy TN-1 variety in place of local paddy. On the basis of the figures for these four 'best' villages, the net loss on the experiment of the high yielding varieties programme for the district works out to Rs. 19.50 lakhs for an area of 13000 acres actually brought under the variety. It must be noted here that this loss was incurred in a district in which the 'area covered' was nearly one fourth of the 'area covered' under the variety in the entire State and again for a crop accounting for nearly a third of the total high yielding varieties programme therein.

The early flowering, the partial failure of the crop and the heavy requirement of fertilizer for the variety resulted in a suspicion about the variety in the minds of the cultivators. From the previous experience, the cultivators felt that when the local varieties gave a good response to the use of a lower dose of fertilizer why should they involve into a risk by using a higher dose of fertilizer for the new variety. Some of the participants therefore, planned to grow a local variety in its place as a second crop even with assured supply of water in the summer. Some of the officials at the district level and office bearers of the Zilla Parishad also expressed their opinion that unless the necessary arrangements were made for supplying water to this variety even in the kharif season, it would be futile to expect larger yields from the variety. It might, however, not result in crop failures every year as the rainfall reliability in the selected district as was noted in the first chapter, was itself somewhat high. Because of the shorter length of the straw, the variety did create a problem for some of the cultivators especially the small cultivators, as the straw was of no use for thatching their houses. The cultivators in the area had to thatch their houses with fresh long paddy straw every year and some of the small farmers who had devoted larger parts of their holdings for the new variety would have to purchase the straw for thatching their houses. The small farmers have, therefore, become reluctant to grow the variety in future. This problem was, however, somewhat severe in the northern part of the district where most of the houses were thatched with straw than in the southern part where a larger proportion of the houses were tiled.

The variety was found to be suited mainly to the mid-late soils. The selected district being well known for its late varieties, quite a small proportion of the paddy land consisted of the mid-late soil. As estimated by the Agricultural Department in the district only 65,000 acres or one-fifth of the total area under paddy in the district consisted of the mid-late soil. This availability of limited area coupled with the other limitations due to the requirements of assured water supply, higher expenditure over fertilizer and the unsuitability of the straw from this variety for thatching the houses might limit considerably the expansion of this variety in the district.

As observed in the village studies, the cultivators have already accepted the variety at least for giving a fair trial to it again on smaller parts of their holdings. Some of them

think that it may be really a high yielding variety but it would need further trials under more favourable conditions. This means that they are not prepared to expand the area under the variety but on the contrary reduce it during the ensuing year. Some of the nonparticipants are also thinking of giving a trial for this variety. In view of such tendencies on the part of the cultivators it, therefore, seems that there would not be much scope for any large scale expansion of the variety in the ensuing year at least, as the study in the selected villages shows. The State authorities have, however, raised the target for the variety from 0.45 lakh acres to 0.95 lakh acres in the ensuing year!

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