

GOKHALE INSTITUTE MIMEOGRAPH SERIES NO. 5

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

A. R. RAJAPUROHIT

**GOKHALE INSTITUTE OF POLITICS AND ECONOMICS,
POONA 4 (INDIA)**

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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 the second in a series of investigations, we are undertaking, into the implementation and operation of this programme. The study relates to Mandya, a rice growing district in Karnatak. The difficulties met by the HYVP programme in this district appear to be rather peculiar. The district has been covered by the package programme since 1962 and a number of improved varieties of rice have been introduced in this district under that programme. The local farmers were apparently satisfied with the results of these improved varieties and had accepted them on a wide scale. When the HYVP was introduced in the Rabi season of 1966-67 a new variety, namely Taichung-65, was recommended. A number of farmers gave trial to the same. Nevertheless, in the following Kharif season of 1967-68 many of them appeared reluctant to give another trial to the new variety. They appeared to prefer the older improved varieties to the Taichung-65.

Their reluctance to accept Taichung-65 may be temporary and it is possible that they may eventually accept the new variety. The case illustrates, however, the point that before a new variety is recommended under the programme, careful consideration should be given to the already accepted improved varieties in the area. It is only when one is satisfied that the new variety being recommended is distinctly superior that its propagation on a massive scale may be undertaken. One must always keep in view the possibility that, in a large country such as ours, different varieties may be found more suitable to different regions. At present it seems that the High Yielding Varieties Programme is being directed very much centrally with inadequate attention to such local considerations.

Gokhale Institute of
Politics and Economics,
Poona-4.

V. M. Dandekar
Director.

July 11, 1968.

PREFACE

The new strategy in agriculture in India to enlarge the food production envisages the following three points in the main: (i) multiplication and distribution of the seeds of high yielding varieties, (ii) institutional arrangement for the timely distribution of the inputs like chemical fertilizers, pesticides etc., and (iii) institutional arrangement for the supply of credit to buy the necessary inputs.

In the Mandya district of Mysore, Taichung-65 variety of rice was introduced as a high yielding variety in the Rabi season of 1966-67. The present study attempts a critical review of its performance during the first year of its introduction. The Mandya district was covered by the 'package' programme since 1962 and the High Yielding Varieties Programme was introduced in the district as a part of the 'package' programme. The institutional arrangement for the supply of seeds, fertilizers and plant protection chemicals for the High Yielding Varieties Programme in the district was quite adequate.

The programme evidently proved to be a failure as many farmers who had grown the Taichung-65 variety in the Rabi season of 1966-67 were reluctant to grow it in the Kharif season of 1967-68. The following appear to be the most important reasons for the non-acceptability of the Taichung-65 variety by the farmers in Mandya: (i) it is costlier to grow; (ii) both grain yield and straw yield are less; and (iii) it does not get good price in the market. The improved varieties of rice introduced in the package programme were superior in quality and were high yielding also. The Taichung-65 variety could not compete with the existing improved varieties.

Our thanks are due to the Project Officer, IADP, Mandya and his technical team, who supplied us the major part of the data used in Part I. The Block Development Officers of Pandavapura and Srirangapatna are to be thanked for making arrangement for our field staff to contact the selected farmers. Finally, we cannot but express our gratitude to all the selected farmers who responded to our questions patiently and gave the best co-operation in the collection of the data.

Gokhale Institute of
Politics and Economics,
Poona 4.

A. R. Rajapurohit.

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PART I

ORGANIZATION AND IMPLEMENTATION OF THE PROGRAMME

1.1. Programme in Mysore State

The High Yielding Varieties Programme was launched in the Mysore State in the Kharif season of 1966-67. The following hybrid varieties of jowar, bajra and maize, and the exotic varieties of rice and wheat were recognised as the high yielding varieties in the State :-

Hybrid varieties

1. Hybrid jowar (CHS-1)
2. Hybrid bajara (HB-1)
3. Hybrid maize (Deccan)

Exotic varieties

4. Rice (Taichung-65, Taichung Native 1)
5. Wheat (Sonora-64, Larma Roza)

At the state level, the Director of Agriculture was entrusted with the overall charge of the High Yielding Varieties Programme, and was assisted by one of his subordinate officials. No additional staff was added wholly for the purpose of the High Yielding Varieties Programme. The functions of the Director of Agriculture in respect of the high yielding varieties programme may be summarised as follows :-

- A. Fixing the districtwise targets for different crops of high yielding varieties separately for the Kharif and the Rabi seasons and recording their achievement.
- B. Programming for the certified seed-growers' area for different crops of high yielding varieties and arrangement for the supply of seeds to the users.
- C. Programming for the demand for the controlled fertilizers (all types of nitrogenous fertilizers) and channelling their supply through the Taluka Agricultural Marketing Co-operative Societies which work as the agencies to the state government.
- D. Guiding the district level agricultural extension staff in respect of the propaganda and dissemination of technical literature on the crops of high yielding varieties suitable to different districts.

A. Targets and Achievements

Figures regarding the targets and achievements of the areas under different crops of high yielding varieties in the State for the year 1966-67 are presented in Table 1.1. The total area under each crop refers to the year 1963-64 and it is presumed that it did not vary significantly for the year 1966-67 which was the reference period for the present enquiry. It is seen that the targets for the high yielding variety as percentage of total area under the respective crop varied from crop to crop and from season to season. The target for high yielding variety of paddy for instance was 22,457 acres, or 2.60 per cent of the total

Table 1.1 : Targets and achievements of high yielding varieties of crops in Mysore (1966-67)

(Area in acres)

Season	Crop	Total area* under the crop	Area under high yielding variety (Target) (4)	Area under high yielding variety (achievement) (5)	(4) as per cent of (3) (6)	(5) as per cent of (4) (7)	(5) as per cent of (3) (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Kharif	Paddy	22,20,052	57,650	22,457	2.60	38.95	1.01
	Jowar	33,80,614	60,500	14,535	1.79	24.02	0.43
	Bajra	13,37,797	17,100	878	1.28	5.13	0.07
	Maize	35,246 [‡]	50,000	20,691	-	41.38	-
Rabi	Paddy	4,27,785	68,000	40,262	15.89	59.21	9.41
	Wheat	7,70,150	4,400	2,494	0.57	56.68	0.32
	Jowar	40,59,593	54,500	26,212	1.34	48.09	0.65
	Bajra	-	1,000	942	-	94.20	-
	Maize	-	44,600	16,116	-	36.13	-

* Total area refers to the year 1963-64.

‡ Area refers to both Kharif and Rabi Seasons.

area under paddy during the Kharif season, whereas the corresponding area and percentage for the Rabi season were 40,262 acres and 15.89 per cent respectively. The targets for other high yielding varieties like wheat, jowar, bajra and maize as percentages of the total areas under the respective crops varied from 0.57 per cent in the case of wheat to 1.79 per cent in the case of Kharif jowar. The achievements as percentage of the targets were generally lower in the case of the Kharif crops than in the case of the Rabi crops. In the case of the Kharif crops, those percentages varied from 5.13 per cent for Bajra to 41.38 per cent for maize, whereas for the Rabi crops they varied from 36.13 per cent for maize to 94.20 per cent for Bajra.

The targets of acreages under the crops of high yielding varieties for different districts were presumed to be fixed by the Director of Agriculture on the basis of the following two considerations :-

(i) Total acreage under the crop during the corresponding previous season; and

(ii) Existence of the potentialities for the development of the high yielding variety in the district, namely, irrigation, net-work of service co-operatives, etc.

Figures regarding the targets and achievements of the area under high yielding paddy for different districts in the State for the year 1966-67 are given in Table 1.2. The proportion of the target area under high yielding variety paddy to the total area under paddy was not uniform over all the districts for either the Kharif or the Rabi season. In the case of the Kharif season, for two districts, namely, Hassan and Raichur, the proportion was much higher than the average, being 9 per cent and 31 per cent respectively. For the Rabi season, the districts of Shimoga, Mandya, Chikmagalur, Coorg, Belgaum, Raichur and Bellary, had very high proportions of targets for high yielding variety paddy. For both the seasons, it appears that there is little relationship between the targets and the achievements of the high yielding variety paddy for different districts. For instance, in Mysore district, there was no target for growing high yielding variety paddy in the Rabi season, whereas it was later on found that the proportion of the high yielding variety to the total area under paddy was very high. This shows that the two considerations, on the basis of which the targets were presumed to have been fixed for each district, had little meaning.

B. Supply of Seeds

The hybrid seeds of jowar, bajra and maize are produced by the certified seed-growers under the supervision of the field staff of the Department of Agriculture. The seeds of the exotic varieties of rice like Taichung-65 and Taichung Native 1 are produced in the demonstration plots spread over in different parts of the State. The area under different hybrid seeds is programmed by the Director of Agriculture who is assisted by the Seed Development Officer. For the exotic seeds, there is however no such programme.

The actual area under different hybrid seeds as reported by the certified seed growers is given below :-

Table 1.1 : Targets and achievements of high yielding varieties of crops in Mysore (1966-67)

(Area in acres)

Season	Crop	Total area* under the crop	Area under high yielding variety (Target) (4)	Area under high yielding variety (achievement) (5)	(4) as per cent of (3) (6)	(5) as per cent of (4) (7)	(5) as per cent of (3) (8)
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	Maize	35,246 [‡]	50,000	20,691	-	41.38	-
Rabi	Paddy	4,27,785	68,000	40,262	15.89	59.21	9.41
	Wheat	7,70,150	4,400	2,494	0.57	56.68	0.32
	Jowar	40,59,593	54,500	26,212	1.34	48.09	0.65
	Bajra	-	1,000	942	-	94.20	-
	Maize	-	44,600	16,116	-	36.13	-

* Total area refers to the year 1963-64.

‡ Area refers to both Kharif and Rabi Seasons.

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The actual area under different hybrid seeds as reported by the certified seed growers is given below :-

Table 1.2 : Targets and achievements of high yielding varieties of paddy in different districts of Mysore (1966-67)

District	Kharif						Rabi					
	Total area under Paddy (1963-64)	Area under H.Y.V. Paddy (Target)	Area under H.Y.V. Paddy (Achievement)	(3) as per cent of (2)	(4) as per cent of (3)	(4) as per cent of (2)	Total area under Paddy	Area under H.Y.V. Paddy (Target)	Area under H.Y.V. Paddy (Achievement)	(9) as per cent of (8)	(10) as per cent of (9)	(10) as per cent of (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Bangalore	30,959	-	243	-	-	0.78	50,755	4,000	398	7.88	9.95	0.78
Kolar	53,536	-	152	-	-	0.28	11,226	2,000	1,111	17.81	55.55	9.90
Tumkur	91,281	-	286	-	-	0.31	49,902	10,000	1,594	20.03	15.94	3.19
Chitradurga	17,070	-	100	-	-	0.59	30,335	4,000	4,016	13.19	100.40	13.24
Shimoga	3,31,404	10,000	5,085	3.02	50.85	1.53	4,287	4,000	5,059	93.30	126.48	118.01
Mysore	1,46,482	5,000	671	3.41	13.42	0.46	4,017	-	6,080	-	-	151.36
Mandya	61,539	-	130	-	-	0.21	35,852	10,000	1,293	27.89	12.93	3.61
Chikmagalur	1,15,339	5,000	718	4.34	14.36	0.62	4,492	1,500	966	33.39	64.40	21.50
Coorg	1,08,443	5,000	2,774	4.61	55.48	2.56	927	1,000	246	107.87	24.60	26.54
Hassan	72,185	6,500	184	9.00	2.83	0.25	57,579	1,500	765	2.61	51.00	1.33
South Kanara	3,62,000	5,000	5,500	1.38	110.00	1.52	1,48,305	13,000	9,000	8.76	69.23	6.07
Belgaum	1,75,869	500	567	0.28	113.40	0.32	653	500	10	76.50	2.00	1.53
North Kanara	2,05,704	5,000	539	2.43	10.78	0.26	11,188	500	503	4.46	100.06	4.49
Bijapur	14,562	-	-	-	-	-	216	-	-	-	-	-
Dharwar	2,58,088	3,000	606	2.16	20.20	0.21	-	1,000	206	-	20.60	-
Gulberga	51,720	-	-	-	-	-	7,270	-	-	-	-	-
Raichur	38,665	12,000	2,295	31.03	19.2	5.94	3,169	7,000	2,645	220.88	37.78	83.46
Bidar	42,648	-	-	-	-	-	-	-	-	-	-	-
Bellary	42,558	650	2,607	1.53	401.07	6.13	7,612	8,000	6,370	105.09	79.62	83.68
TOTAL	22,20,052	57,650	22,457	2.60	38.95	1.01	4,27,785	68,000	40,262	15.89	59.21	9.41

	1966 Summer	1967 Summer
Hybrid Jowar	1,268 acres	3,028 acres
Hybrid Maize	500 acres	172 acres
Hybrid Bajra	53 acres	49 acres

There are 9 seed Processing Units - a majority of them run by the government - in the State. The seeds are procured by these units from the certified seed growers as well as from the demonstration plots in the case of exotic rice varieties, and they are further tested for their purity, germination percentage etc. After treating with fungicides, they are packed in the bags of 10 kg. and sealed. The selling price per Kilogram of different hybrid seeds varies from Rs.8 to Rs.10.30 for Jowar and Bajra and Rs.5.30 for maize. But for the high yielding varieties of wheat, namely, Sonora-64 and Larma Roza, the State produces the seeds more than its requirement. The surplus seeds are exported to the other States. In 1966-67, the State exported 19 metric tons of Taichung-65 and Taichung Native 1 seeds to West Bengal, Andhra Pradesh, Jammu and Kashmir, Assam, Gujarat and Goa. Similarly, seeds of hybrid Jowar, hybrid Bajra and hybrid maize were exported to the other States. The seeds of high yielding variety wheat were however imported from Uttar Pradesh.

C. Supply of Fertilizers

Supply of all the nitrogenous fertilizers is controlled by the State for distribution whereas the phosphatic and potassic fertilizers are freely available in the market. The Director of Agriculture receives indents for nitrogenous fertilizers from the Taluka Agricultural Marketing Co-operative Societies well in advance to each agricultural season. After endorsing these indents, the Director of Agriculture sends them to the Central Fertilizer Pool, and the quota of the nitrogenous fertilizers is allotted to different Taluka Agricultural Marketing Co-operative Societies on the basis of the availability of the fertilizers.

In 1965-66, the total demand for the nitrogenous fertilizers from the State was 2,79,766 metric tons whereas the allotment made was 1,29,393 metric tons amounting to 46.25 per cent of the demand. In 1966-67, the total demand was 4,44,897 metric tons and the allotment received was only 1,82,258 metric tons or 40.97 per cent of the demand.

As the recommended rate of fertilizer application to the high yielding variety crops is significantly high, the Taluka Agricultural Marketing Co-operative Societies are advised to send separate indents for the requirements by the high yielding variety crops. Such indents are prepared on the basis of the programmed area under different high yielding variety crops.

D. Propaganda and Technical Advice

Standard cultivation practices for different high yielding variety crops are worked out by the Director of Agriculture assisted by the agronomist. These practices vary from district to district depending upon the soil-climate complex of the district. They are sent to the

district level agricultural extension officials who are expected to bring out pamphlets for each high yielding variety crop suitable to the district so that the technical knowledge about those crops is disseminated among the farmers.

1.2. Characteristics of Mandya District

The district of Mandya was selected for the study of the high yielding variety programme for the following reasons :-

(i) The district was covered by the Intensive Agricultural District Programme since 1962-63.

(ii) A net-work of efficient co-operative institutions exists at the district, taluka and the village levels.

(iii) It is an important rice-growing district in the State.

The district is situated in the southern part of Mysore State. It is predominantly an agricultural district. About 87 per cent of the working population is entirely depending upon agriculture for their livelihood. Of the total cultivated area of 6,29,864 acres, about 1,90,000 acres are under irrigation amounting to 30 per cent of the cultivated area. The Krishnarajasagar dam, constructed over the river Cauvery is the major source of irrigation. An area of about 10,000 acres is irrigated by small tanks spread over in different parts of the district. The normal rainfall in the district varies from 652 m.m. to 690 m.m.

The soils in the district may be roughly classified into three groups, namely, red loams, gravelly and clayey soils. Red loams are medium deep, free and easy to work and also respond very well to improved agricultural practices. These soils are mainly found in Maddur, Malavalli, Nagamangala and Krishnarajapet talukas in the northern and eastern parts of the district. Gravelly soils are generally coarse in nature, shallow and poor in fertility and are mainly found in parts of Mandya, Malavalli and Nagamangala talukas, in the central part of the district. The clayey soils are generally rich and are found under all old irrigated channels of Srirangapatna, Krishnarajapet and Pandavapura talukas.

Rice, Ragi and sugarcane are the major crops in the district. About 25 per cent of the total cropped area is under rice and about 6 per cent is under sugarcane. Ragi, which is a dry crop, is grown on 32 per cent of the total cropped area. The rest of the area is devoted to the minor crops like pulses, groundnut, cotton and fodder crops.

The overall charge of the Intensive Agricultural Development Programme rests with the Deputy Commissioner of the district though the execution of the programme is entirely done by the Project Officer who is in the grade of the Deputy Director of Agriculture. On the co-operative side, the Deputy Commissioner is assisted by a Deputy Registrar of Co-operative Societies. The Deputy Commissioner works as the co-ordinating officer for agriculture, co-operation and other departments. The other personnel at the district level include Subject-matter Specialists in agronomy, soil science, plant protection, water use and

farm management. Besides these, there are other specialists like Agricultural Engineer, Seed Development Officer and Agricultural Information Officer. The normal staff existing at the district level in the agricultural and the co-operative departments is wholly associated with the package programme.

At the sub-divisional level (comprising of 3 to 4 talukas) there is one Additional Assistant Agricultural Officer for agricultural sector and the Additional Assistant Registrar for Co-operative Societies for the co-operative sector. At the Block level, the Block Development Officer is in charge of the programme assisted by the Agricultural Extension Officers and the Village Level Workers. On the co-operative side, there are Co-operative Extension Officers and Co-operative Supervisors.

The net-work of the co-operative institutions at the district, taluka and village levels is arranged in an efficient way to link the supply of agricultural-inputs and the supply of agricultural credit. The institutional arrangement for the supply of agricultural-inputs and agricultural credit is shown in Chart 1.1.

It is seen from the Chart that any co-operative marketing institution at the district level is conspicuous by its absence. The District Central Co-operative Bank advances credit to the Taluka Agricultural Marketing Co-operative Societies for the purchase of the agricultural inputs like seeds, fertilizers, plant protection chemicals and improved farm implements. The Bank also advances short term credit to farmers through the Primary Service Co-operative Societies. The farmers buy the agricultural-inputs from the Primary Service Co-operative Societies. The primary societies get the supplies from the Taluka Agricultural Marketing Co-operative Societies.

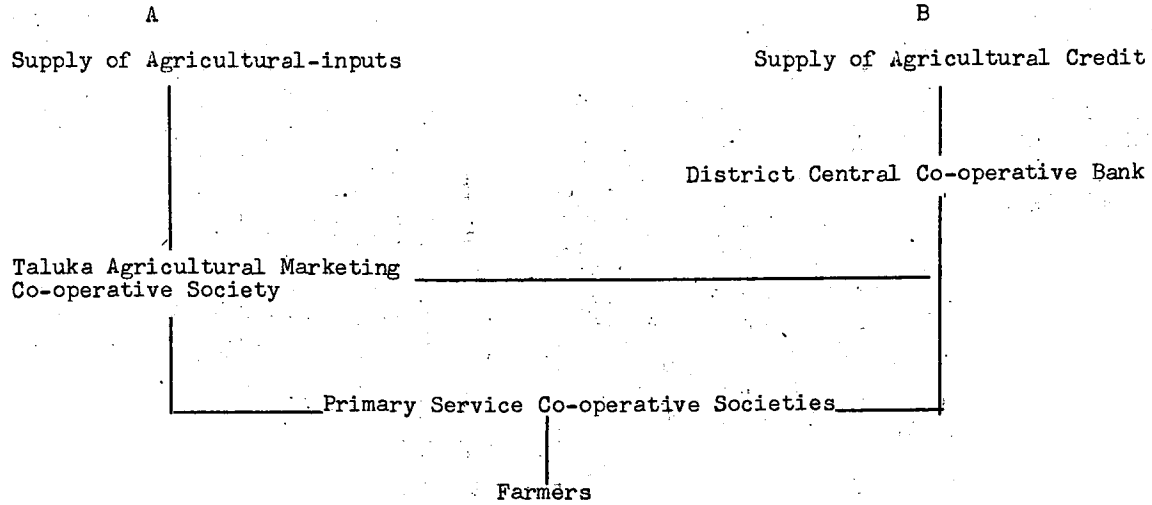
1.3. Programme in Mandya District

There was no programme for growing the high yielding varieties in Mandya District during the Kharif season of 1966-67, when the programme was however launched in many other districts in the State. Though there was no programme, high yielding varieties like hybrid jowar, hybrid maize and Taichung-65 rice were grown on 82 acres, 84 acres and 131 acres respectively in the district mainly due to the propaganda efforts made by the extension officials of the package programme. Hybrid maize and Taichung-65 rice were successfully grown in the district though the performance of hybrid jowar was not to the mark mainly due to the adverse climatic conditions. The failure of hybrid jowar was also due to heavy infestation of shoot-fly.

In the Rabi season of 1966-67, an intensive programme to extend the area under high yielding varieties was drawn up by the Project Officer. The targets for Taichung-65 rice, hybrid maize and hybrid jowar were set at 10,000 acres, 2,500 acres and 5,000 acres respectively. It appears that the separate targets for each taluka were not made because it was not possible for the Project Officer to estimate the extent of response by the farmers in different talukas to the high yielding variety crops. It was however officially decided to extend the area under high yielding varieties in the canal irrigated areas covered by the following branches of the main canal :-

CHART 1.1

Institutional arrangement for supply of agricultural-inputs and agricultural credit



Branches	Area (acres)
1. V. C. 1st Section	7,000
2. Maddur branch	21,000
3. Cauvery and Loksar branches	15,000
4. Keregodu branch	7,000
5. Shimsa branch	4,000
6. Hebbakawadi branch	8,000
7. Turaganur branch	6,000
8. Nidughatta branch	5,000
9. V. C. Nalla tanks	9,000
10. Old Canal Area	1,500
11. (a) C. D. S. Nalla)	
(b) Virijanadi Nalla)	
(c) Devaraj Nalla)	12,000
(d) Bangardoddi Nalla)	
Total	95,500

In a pamphlet issued by the package office on 31-12-1966, farmers were advised to grow hybrid jowar, hybrid maize, Taichung-65 rice and other short-duration rice varieties like T.K.M.-6, China-2 and China-45, and S 317. According to the programme, 17,500 acres were to be covered by the high yielding varieties and the rest of the area by short-duration rice, irrigated ragi and groundnut. Sugarcane was permitted to be grown on about 10,000 acres of land.

Due to the limited water supply from the Krishnarajasagar, it was decided to supply water for a limited number of days only. The farmers in the canal areas were informed that the water was to be supplied on the following days:-

January 1967 - 5th to 15th
February 1967 - 1st to 10th

The farmers were assured of intermittent water supply in the months of March and April. In the month of May, however, no water supply was assured. With the water supplied in January, the farmers were advised to prepare land for transplanting rice and ragi and at the same time to grow rice and ragi seedlings.* Land was also to be prepared for sowing hybrid jowar and hybrid maize. With the water available in February, transplantation of rice and ragi was to be done and sowing of hybrid jowar and hybrid maize was to be undertaken.

Table 1.3 presents the area under different crops during Rabi 1966-67 in Mandya district. It is natural that the area under the Summer crops is significantly high in the predominantly irrigated talukas of Mandya, Maddur Pandavapura and Srirangapatna. As regards the achievement of the area

* Irrigated Summer ragi in Mandya is mainly transplanted.

Table 1.3 : The area under different crops during Rabi 1966-67 in Mandya District

Name of the Taluka	Paddy (General)	Taichung-65	Total (Paddy)	Hybrid Jowar	Hybrid Maize	Irrigated Ragi	Groundnut	Sugarcane	Total
	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.	Ac.
Mandya	6,695.00	202.05	6,897.05	31.35	70.20	9,657.00	1,445.00	5,545.00	23,646.20
Maddur	3,500.00	146.00	3,646.00	41.35	18.30	5,151.00	350.00	3,000.00	12,207.25
Malavalli	1,500.00	40.30	1,540.30	60.00	40.00	2,773.00	110.00	215.00	4,738.00
Pandevapura	2,200.00	206.00	2,406.00	31.00	19.00	2,935.00	75.00	3,500.00	8,966.00
Srirangapatna	2,727.00	502.00	3,229.00	52.00	100.00	2,227.00	300.00	2,527.00	8,435.00
Krishnarajapet	225.00	79.00	304.00	14.00	6.00	590.00	--	81.00	995.00
Nagamangala	1,500.00	116.00	1,616.00	9.00	11.00	7.00	--	125.00	1,678.00
Total	18,347.00	1,291.35	19,638.35	239.30	265.10	23,340.00	2,280.00	14,993.00	60,756.35

under the high yielding varieties in the district, it was not at all satisfactory. The target for Taichung-65 rice was 10,000 acres and the achievement was only 1,292 acres or 12.93 per cent of the target. The target for hybrid maize was 2,500 acres and the achievement was only 265 acres; and the corresponding figures for hybrid jowar were 5,000 acres and 240 acres respectively.

In Table 1.3A, proportions of area under Taichung-65 rice to total rice are given for different talukas. The proportions are very high for Krishnarajapet and Srirangapatna talukas, being 26.30 per cent and 15.55 per cent respectively. As the total area under rice in Krishnarajapet is very low being only 304 acres, the high proportion of Taichung-65 rice in that taluka is really not significant. On the other hand, in Pandavapura taluka, though the proportion of Taichung-65 to total rice is only 8.56 per cent, the total area under Taichung-65 variety is as high as 206 acres. It was therefore decided to select Srirangapatna and Pandavapura talukas for our enquiry.

Table 1.3A : Proportion of area under Paddy (local) and Paddy (T-65) in Mandya district for the Rabi 1966-67

Name of the Taluka	(Area in acres)			
	Paddy (local)	Paddy (Taichung-65)	Total	(3) as per cent of (4)
(1)	(2)	(3)	(4)	(5)
Mandya	6,695	202	6,897	2.93
Maddur	3,500	146	3,646	4.00
Malavalli	1,500	41	1,541	2.66
Pandavapura	2,200	206	2,406	8.56
Srirangapatna	2,727	502	3,229	15.55
Krishnarajapet	225	79	304	26.30
Nagamangala	1,500	116	1,616	7.18

1.4. Background of Package Programme

In Mandya district, the High Yielding Varieties Programme was launched as a part of the 'package' programme and hence it is relevant to know the salient features of the package programme in the district since its introduction in 1962. In this section, some aspects of the package programme in Mandya, namely, farm planning, seed multiplication programme, fertilizers, plant protection, implements programme, and composite demonstrations are described. In this section, the data are used from the IADP records.

(1) Farm Planning :- Writing up of individual farm plans to the farmer is an important function in the package programme. It is presumed that such plans help the farmers to plan the use of their limited resources in an efficient way and to increase the farm productivity. The details of progress achieved so far indicate that there has been steady response from the farmers in accepting farm plans on their individual holdings. Acceptance of farm planning helped the farmers in adoption of package of practices, judicious use of fertilizers, adoption of suitable cropping pattern and

ultimately resulting in better management efficiency of the individual farmers. The farmers who accept the farm plans are called as 'participant' farmers. According to the benchmark survey conducted in the district, the average yield of different crops for the participant farmers was much higher than that for the non-participant farmers as seen in Table 1.4.

Table 1.4 : Yield rates of different crops for participant and non-participant farmers in Mandya district

Crop	Year	Average yield in quintals per hectare	
		Participant	Non-participant
Rice	1962-63	25.8	22.0
	1963-64	27.1	21.8
	1964-65	26.3	21.0
Ragi	1962-63	8.0	6.9
	1963-64	9.8	6.8
	1964-65	11.3	7.4
Sugarcane (Gur)	1963-64	117.0	104.1
	1964-65	123.4	110.1

In Table 1.5, data are given in respect of the progress of farm plans in Mandya district.

Table 1.5 : Progress of farm plans in Mandya district

Year	Target	Plans Pro- cessed	Percen- tage covered	Area covered (acres)		Credit advanced (Rs.)
				Wet	Dry	
1962-63	20,000	11,000	55	31,639	34,599	80,46,684
1963-64	40,000	24,595	61	59,917	28,915	78,09,564
1964-65	70,000	63,703	91	1,02,570	1,09,288	82,03,187
1965-66	1,00,500	86,057	86	1,56,605	1,23,108	1,08,31,128
1966-67	1,00,500	90,432	90	1,21,957	1,38,929	1,50,10,104

(ii) Seed multiplication programme :- A programme for the multiplication and distribution of the quality seeds is taken up as an important activity of the package programme and the efforts to procure and distribute quality seeds are mainly intensified in the canal irrigated areas. A remarkable achievement is made after the introduction of the package programme in multiplication and distribution of the improved seeds under a phased programme to cover 25 per cent of the total area with improved strains each year. This has also helped in a significant way in reducing a large number of varieties in vogue to between 9 and 4 in different talukas.

The marketing co-operatives have been fully involved in the programme for procurement and distribution of seeds after treating the seeds under technical supervision and guidance. During 1962-63, 416 quintals of improved paddy

seed was distributed to the farmers after treating the seed. During 1963-64, 1,513 quintals of paddy seed was procured from the registered seed-growers by the marketing co-operatives and distributed to farmers after salt-water selection (a method according to which the grains sinking in salt water solution are selected for sowing) and treated with Agrosan. The seeds so treated and packed in special bags of 8 Kilograms and 16 Kilograms were distributed to farmers through the service co-operatives. The programme was continued in the subsequent years and the progress achieved in those years can be seen in Table 1.6. It can also be seen that in 1966-67, Taichung-65 seed was distributed to farmers under this programme only. The programme does not include the procurement and distribution of hybrid jowar and hybrid maize seeds because there were no registered seed growers in the district producing those seeds. Hybrid jowar and hybrid maize seeds are however imported from the other districts and distributed to farmers through the service co-operatives.

(iii) Fertilizers :- In 1961, before the package programme was introduced in the district, about 19,570 metric tons of fertilizers were used. After the introduction of the programme, the use of fertilizers in the district steadily increased as seen in Table 1.7 wherein figures are given in respect of targets and distribution of different types of fertilizers in the district from 1961-62 to 1966-67. Efforts were being made by the extension officials to convince the farmers to use balanced fertilizers and not to give too much stress on any one type of nitrogenous fertilizer only which is the case in the neighbouring districts. It can be seen from the Table that the efforts of the extension officials were fruitful in the district, over a period of time. In Mandya, farmers have learnt to use N, P and K in a balanced proportion and various types of nitrogenous fertilizers like Ammonium Sulphate, Calcium Ammonium Nitrate, Ammonium Sulph Nitrate and Urea are being used by the farmers in large quantities.

The extension officials have also advised the farmers to use the fertilizers containing N, P and K in the proportions which will give maximum yield for a certain crop. Table 1.8 gives the seed and fertilizer recommendations for different crops including the high yielding varieties.

(iv) Plant protection measures :- According to the Plant Protection Officer, farmers were not responsive to take up plant protection measures in the initial stages. Due to the intensive efforts made during the programme period, there has been a remarkable change in the attitudes of the farmers towards the plant protection measures.

Upto the end of 1965-66, 410 hand operated sprayers were procured and supplied to the farmers at 50 per cent subsidised rate. Besides, 128 power sprayers were distributed to several Blocks in the district for demonstration purposes. Besides this, several Taluka Development Boards and the N.E.S. Agency purchased and distributed plant protection equipments like sprayers and dusters from their own funds at concessional rates.

Area-wise demonstrations on plant protection measures are organized. On an average, about 10,000 acres are covered annually by plant protection measures. In the year 1966-67, Ragi crop was affected by an unknown disease-complex and an area of 33,457 acres were covered under plant protection measures. A sum of Rs.83,000 was provided out of the I.A.D.P. funds for the purchase of the new plant protection chemicals

Table 1.6 : Targets and achievements of distribution of improved seeds in Mandya district

(Figures in quintals)

Seed variety	1962-63		1963-64		1964-65		1965-66		1966-67	
	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement
<u>RICE</u>										
S.1092	471	416	1,540	1,038	1,540	891	1,540	1,095	1,540	647
S. 701	-	-	950	368	950	1,269	950	1,289	950	1,511
S. 749	-	-	160	68	160	130	160	144	160	87
S.R.26.B	-	-	300	17	300	20	300	30	300	198
S.2222	-	-	-	22	-	56	-	56	-	42
S. 317	-	-	30	-	30	-	30	-	-	-
C.H. 2	-	-	20	-	20	-	20	-	-	-
B.A.M. 3	-	-	-	-	-	-	-	-	30	42
Taichung-65	-	-	-	-	-	-	-	-	20	24
<u>RAGI</u> (Rainfed)	-	-	-	-	-	-	-	138	-	134
H.22 (Irrigated)	-	-	-	-	-	-	-	-	-	445
Poorna, Annapoorna	-	-	-	-	-	-	-	-	-	-

Table 1.7 : Targets and distributions of different types of fertilizers in Mandya district

(Figures in metric tons)

Type of fertilizer	1961-62		1962-63		1963-64		1964-65		1965-66		1966-67	
	Target	Distribution	Target	Distribution	Target	Distribution	Target	Distribution	Target	Distribution	Target	Distribution
<u>(A) Nitrogenous fertilizers</u>												
1. Ammonium Sulphate	-	9,531	7,500	13,382	10,000	17,532	16,060	16,125	16,060	24,413	20,000	15,651
2. Ammonium Sulph Nitrate	-	661	2,000	3,805	2,500	3,961	3,895	2,689	3,895	424	2,500	29
3. Calcium Ammonium Nitrate	-	441	2,500	2,151	5,000	9,134	10,305	6,881	10,305	3,999	8,000	1,870
4. Urea	-	2,014	4,000	7,600	6,000	3,680	6,360	4,536	6,360	6,508	5,000	10,271
5. Nitrophosphate	-	-	-	-	800	-	590	-	590	-	-	403
6. Ammonium Phosphate	-	-	-	-	800	-	430	-	430	-	-	100
Total Nitrogenous Fertilizers	-	12,620	16,000	26,938	25,100	34,307	37,640	30,231	37,640	35,344	35,500	28,324
<u>(B) Phosphatic fertilizers</u>	-	6,813	15,000	10,900	25,000	21,865	27,700	10,319	27,700	9,428	20,200	13,053
<u>(C) Potassic fertilizers</u>	-	139	2,000	500	4,000	747	5,000	391	5,000	1,131	6,200	4,557
<u>(D) Mixtures</u>	-	-	-	-	-	168	-	4,152	-	5,355	-	17,405
GRAND TOTAL	-	19,572	33,000	38,338	54,100	57,087	70,340	45,093	70,340	51,258	61,900	63,339

like Dimecron-100, Metasystax, Zineb, Malathion and Diathane to control the disease-complex on Ragi for spraying on an extensive area during 1966-67, free of cost.

Table 1.8 : Recommended doses of seeds and fertilizers for the High Yielding Varieties Programme - 1966-1967

	Seed rate per acre in Kgs.	Fertilizer Recommended per acre N.P.K. in lbs.		
		N.	P.	K.
Taichung Paddy 65	10	80	40	40
Taichung Native 1	10	80	40	40
Hybrid Maize	6.5	80	40	40
Hybrid Jowar (Irrigated)	4	80	40	40
(Dry)	4	40	20	20
Hybrid Bajra (Irrigated)	1.5	60	30	30
(Dry)	1.5	40	20	20
Mariean Wheat	35	80	40	40

On the introduction of the high yielding varieties of hybrid jowar, hybrid maize and Taichung-65 rice, new chemicals like Thimet, Diathane etc. have been stocked at the society level for distribution.

(v) Implements programme :- The use of improved implements in intensive cultivation is as important as that of any other improved practice recommended, especially for the high yielding varieties which, along with better fertilization practice, need better tillage practices also. Different types of agricultural implements such as iron-ploughs, seed drills, ridgers, levellers, puddlers, trawlers, cultivators and rotary paddy weeders were purchased from the marketing co-operatives and distributed to farmers at concessional rates through the Block Agencies. The Taluka Development Boards and the N.E.S. agencies also purchased the specified improved implements out of their funds and distributed to the farmers at concessional rates. In Table 1.9, figures are given in respect of the number of different types of implements distributed to farmers by all the agencies until March 1967.

(vi) Composite demonstrations :- To enable the farmers to understand the economics of package of practices and convince them regarding their efficacy in increasing agricultural production, composite demonstrations were laid out in respect of crops like paddy, Ragi Groundnut, Potato etc. Since 1965-66, demonstrations were conducted for hybrid jowar and hybrid maize and in 1966-67, demonstrations were laid out in respect of Taichung-65 rice. Table 1.10 gives the number of composite demonstration plots laid out on different crops during different years.

The trials on high yielding varieties like hybrid maize, hybrid jowar and Taichung-65 rice recorded higher yields as compared to the check plots. The average yields recorded during 1966-67 are 22 quintals of Taichung-65 rice, 22 quintals of hybrid jowar and 20 quintals of hybrid maize.

Table 1.9 : Distribution of improved implements to the farmers until March 1967

Type of implements	Number
K. M. Plough	2,966
Gurjar Plough	175
Ureka Plough	501
Ragi Seed Drill	227
Levellers	110
Ridgers	238
J. P. C. Weeders	1,049
Puddlers	12
Tramplers	53
Cultivators	1,443
Modified Cooper	460
Buck Scraper	33
Levelling Blade	140
Mysore bar-point Plough	87
Hand weeder	775

1.5. Organization of Co-operative Credit

There are 324 service co-operative societies and 7 marketing co-operatives at the taluka level which undertake distribution of fertilizers, plant protection chemicals and credit to the farmers. Since the inception of the package programme, production credit is made available to the farmers in the form of both cash and kind components. The amount of cash and the quantity of kind components are based on the simple farm plans worked out for each farmer. This system replaced the old practice of providing credit in cash only. It is believed that the new system ensures proper utilization of production credit. Since 1966-67, according to the instructions received from the Reserve Bank of India as well as from the Registrar of Co-operative Societies, some modifications were made in the new system which will be elaborated in this section.

In Mandya district, all the 1,329 villages have been covered by one or the other type of service co-operatives. Out of 1,38,663 agricultural families in the district, 91,857 members have been brought under co-operative fold which works out to 66.3 per cent. On the basis of the simple farm plans, production finance is worked out and channelised through these societies. The production finance advanced by the District Central Co-operative Bank to the service co-operative societies for distribution of crop loan

Table 1.10 : Targets and Achievements of the demonstration programme in Mandya

(Figures indicate No. of demonstrations)

Demonstrations	1962-63		1963-64		1964-65		1965-66		1966-67 Kharif		1966-67 Rabi	
	Tar- get	Achie- vement	Tar- get	Achie- vement	Tar- get	Achie- vement	Tar- get	Achie- vement	Tar- get	Achie- vement	Tar- get	Achie- vement
Paddy (General)	411	357	393	356	292	295	312	300	153	106	-	-
Ragi (irrigated)	-	-	249	104	160	148	161	144	-	-	25	21
Ragi (Dry)	266	208	658	351	358	337	330	323	455	375	-	-
Potato	-	-	25	56	55	65	55	60	-	-	-	-
Groundnut (Irrigated)	-	-	219	102	126	126	126	-	26	10	-	-
Hybrid jowar	-	-	-	-	-	-	83	78	200	81	50	30
Hybrid maize	-	-	-	-	-	-	30	30	40	26	50	22
Taichung-65	-	-	-	-	-	-	-	-	20	15	50	23
Ragi (Dist. Trial)	-	-	-	-	-	-	-	-	34	34	-	-
C.1032 (Varietal)	-	-	-	-	-	-	-	-	6	6	-	-
Rotation of crops	-	-	-	-	-	-	-	-	12	12	-	-
Lime demonstration	-	-	-	-	-	-	-	-	26	24	-	-
Reclamation of alkaline land	-	-	-	-	-	-	-	-	10	8	-	-
Water use management	-	-	-	-	-	-	-	-	6	6	-	-

among the farmers for the years 1962-63 to 1966-67 is as noted below.

Year	Production finance (Rs.)
1962-63	80,68,772
1963-64	78,81,216
1964-65	81,58,902
1965-66	92,03,217
1966-67	1,35,83,027

In Table 1.11, figures are given in respect of the short term loan issued to service societies for the year 1966-67 under the new crop loan system described in the following paragraphs for the kharif crops. Out of 324 service co-operatives, only 248 societies applied for loan. There were in all 45,645 simple farm plans and the demand for short term credit was for Rs.1,73,46,684. After scrutiny, the Bank however sanctioned credit against only 44,811 simple farm plans and the amount of credit sanctioned was Rs.1,54,46,039 which worked out at 89 per cent of the demand. But the actual finance issued by the Bank was only Rs.1,35,10,919 amounting to 87 per cent of the sanctioned amount and 78 per cent of the demand.

Each crop loan under the new system was divided into three components known as 'A' component, 'B' component and 'C' component. How these components are worked out is elaborated below.

'A' Component :- In the beginning of a crop season, farmers are in need of finance not only for their day to day farming activity but also for other purposes like domestic consumption needs. It is presumed that if the co-operative sector does not come to the help of the farmer for meeting his domestic consumption needs, the latter will have to depend upon the moneylender to satisfy his financial needs. It is really an embarrassing situation for the farmers who are already the members of the service co-operatives. The Reserve Bank of India felt that a part of the credit should be advanced in cash in the beginning of the season to each farmer-member and this part of the credit was known as 'A' component credit. The amount of 'A' component credit is fixed at one-third of the maximum production value of the crop cultivated by adopting only traditional cultivation practices. For certain crops like sugarcane, potato, banana, vegetables and other cash crops, 'A' component of the credit is however not advanced. The amount of 'A' component credit for each crop is decided in the meeting of the co-operative extension workers.

'B' Component :- For better farming in general and for certain improved varieties of seeds in particular, farmers will have to make heavy investments, in fertilizers and plant protection chemicals. The requirements of different types of fertilizers and plant protection chemicals for different crops are worked out by the subject-matter-specialists. 'B' component of the credit is always in 'kind' and includes seeds, fertilizers and plant protection chemicals. There is no relationship between the 'A' component of the credit and the 'B' component of the credit. A farmer may desire to take only the 'A' component of the credit and may not like to take the 'B' component.

'C' Component :- A farmer taking 'B' component of credit in the form of seeds, fertilizers and plant protection

Table 1.11 : Short term loans issued to Primary Societies for the year 1966-67 under Crop Loan System (Kharif loans)

Name of Taluka	Societies which applied for loan	Amount applied for by the society				
		No. of Plans	A Component	B Component	C Component	Total
		No.	Rs.	Rs.	Rs.	Rs.
Mandya	48	12,020	13,88,232	26,52,461	11,58,926	51,99,619
Maddur	42	8,865	14,74,070	21,02,859	10,16,593	45,93,522
Malavalli	36	7,467	5,56,648	13,48,193	4,51,596	23,56,437
Srirangapatna	16	3,435	4,68,288	6,24,541	2,94,102	13,86,931
Pandavapura	34	5,150	3,74,605	7,22,853	2,71,232	13,68,690
Krishnarajapet	45	6,309	6,55,734	7,81,686	3,73,642	18,11,062
Nagamangala	27	2,399	2,11,049	2,85,330	1,34,044	6,30,423
Total	248	45,645	51,28,626	85,17,923	37,00,135	173,46,684

(continued)

Table 1.11 : (continued)

Name of Taluka	Societies which applied for loan No.	Amount Sanctioned by the Bank				
		No. of Plans	A Component Rs.	B Component Rs.	C Component Rs.	T o t a l Rs.
Mandya	48	11,565	10,04,366	25,03,398	11,48,464	45,56,228
Maddur	42	8,674	10,76,381	18,57,889	8,49,559	37,83,838
Malavalli	36	7,467	4,70,915	13,30,165	4,39,054	22,40,134
Srirangapatna	16	3,433	3,72,693	6,24,449	2,67,852	12,64,985
Pandavapura	34	5,150	3,48,546	7,14,150	2,50,116	13,12,812
Krishnarajapet	45	6,217	5,27,522	7,64,935	3,28,927	16,21,384
Nagamangala	27	2,303	1,88,880	2,51,917	1,25,861	5,66,658
Total	248	44,811	39,89,303	80,46,903	34,09,833	154,46,039

(continued)

Table 1.11 : (Continued)

Name of taluk	Societies which applied for loan	Amount issued by the Bank				
		No. of Plans	A Component	B Component	C Component	T o t a l
		No.	Rs.	Rs.	Rs.	Rs.
Mandya	48	10,785	7,64,126	19,91,456	8,24,212	35,79,784
Maddur	42	8,599	8,26,401	17,26,504	6,96,734	32,49,639
Malavalli	36	7,340	4,49,574	13,02,012	4,37,201	21,88,787
Srirangapatna	16	3,170	3,51,362	5,79,384	2,66,781	11,97,527
Pendavapura	34	4,872	3,23,159	6,11,044	2,21,872	11,56,075
Krishnarajpet	45	6,037	5,13,601	7,14,573	3,34,475	15,89,649
Nagamangala	27	2,246	1,70,248	2,55,803	1,23,397	5,49,448
Total	248	43,049	33,98,471	72,07,776	29,04,672	135,10,919

chemicals will need some cash to use those inputs on his farm. The amount so required for using the 'kind' credit of 'B' component on the farm is known as 'C' component of the credit. 'C' component of the credit is always in cash, and it is given only to those farmers who take 'B' component of the credit. In short, 'B' and 'C' components of the credit always go together.

The size of crop loan per acre for different crops grown in Summer 1967 was fixed by the Project Officer in consultation with the Deputy Registrar of Co-operative Societies and other subject-matter specialists in the Package Programme. Table 1.12 gives the size of crop loan per acre for different crops divided into 'A', 'B' and 'C' components.

Table 1.12 : Size of crop loan per acre for different crops (Rabi 1966-67)

Name of the crop	(Figures in rupees)			
	'A' Component	'B' Component	'C' Component	Total
Rice (local)	75	115	50	240
Rice (Taichung-65)	75	180	45	300
Ragi (Irrigated)	50	107.50	40	197.50
Ragi (Dry)	25	72.50	29	126.50
Hybrid Jowar	100	265	50	415
Hybrid Maize	75	170	35	280
Groundnut (Irrigated)	-	161	35	196
Groundnut (Dry)	-	138	35	173
Sugarcane	-	630	120	750
Potato	-	327	35	352
				(For 10 gunthas only)
Tobacco	-	131	-	131
Banana	-	290	310	600

For rice (local) the total loan per acre was Rs.240 whereas it was Rs.300 for Rice (Taichung-65). The major variation was in respect of the 'B' component of the loan. For rice (local) the 'B' component of the loan amounted to Rs. 115 while it was Rs.180 for rice (Taichung-65). For hybrid jowar, the size of the total loan was Rs.415 and the 'B' component of the loan amounted to Rs. 265. The corresponding figures for hybrid maize were Rs.280 and Rs. 170 respectively.

It was programmed to issue crop loans to the farmers for the Rabi 1966-67 crops to the tune of Rs. 50 lakhs. According to the Deputy Registrar, this entire loan could not be advanced for want of water in the Krishnarajasagar dam. The District Central Co-operative Bank however sanctioned a loan of Rs. 22.91 lakhs to 6,614 farmers for various crops for the Rabi 1966-67 season. The total area and the crop for which the loans are issued are noted below.

Crop	Area in acres	Rs. in lakhs
Rice (including Taichung-65)	6,654	10.91
Ragi	7,392	10.28
Groundnut	191	0.38
Hybrid jowar	349	1.06
Hybrid maize	114	0.29

Out of the above, the 'B' component of the loan including seeds, fertilizers and plant protection chemicals amounted to Rs.15.62 lakhs.

1.6. Organization of the Programme in the Selected Talukas

As stated in Section 1.3, it was decided to select Pandavapura and Srirangapatna talukas for our enquiry because the area under Taichung-65 rice in those two talukas was quite high. In this section, the organization for the supply of seeds, fertilizers and plant protection chemicals at the taluka level is described to see how the system operated during the Rabi 1966-67 season. The data are given only in respect of Pandavapura and Srirangapatna talukas.

For Rabi (1966-67) season, simple farm plans were not written for the farmers in many villages. The purpose of writing the simple farm plans, according to the extension officials, is to recommend the size of short term credit to the individual farmers. Normally, the District Central Co-operative Bank did not advance short term credit for the Rabi season. A major problem faced by the Bank in advancing the credit to the farmers for growing Rabi crops was that at the time of advancing such credit, in majority of the cases, the previous Kharif loan was not yet paid. According to a bye-law of the Bank, no primary society is eligible for credit unless a minimum of 65 per cent of the dues are repaid. In the case of the societies in Pandavapura and Srirangapatna talukas, none of the societies were qualified for the sanction of the Rabi loans as on 31-12-1966, as it is revealed in the statements given in Tables 1.13 and 1.14. At a later stage, however, a few societies in each taluka repaid more than 65 per cent of their Kharif loans and were qualified for the Rabi loans. In such cases only, simple farm plans were written.

For the supply of the nitrogenous fertilizers the distribution of which is controlled, the officials had to depend upon the demand statement by the different societies. The demand statements were sent to the Taluka Level Fertilizer Review Committee which allotted the nitrogenous fertilizers to different societies. The District Agricultural Officer of the Pandavapura division was the chairman of this Committee and the other members included the Block Development Officer, the Agricultural Extension Officer, the Co-operative Extension Officer, President of the Taluka Development Board and Secretary of the Taluka Agricultural Marketing Society of the respective talukas. In the case of Pandavapura taluka, the Committee met for three times on January 2, February 1, and April 3, during the Rabi season of 1967 and allotted 1,014 metric tons of Ammonium Sulphate and 504 metric tons of Urea to 33 service societies. In the case of Srirangapatna, the Committee met three times on December 23, 1966 and January 3 and April 3, 1967 and allotted 807 metric tons of Ammonium Sulphate, 397 metric tons of Urea and 24 metric tons of Calcium Ammonium Nitrate, to 18 service societies. The allotment was made on the basis of the available stock of the nitrogenous fertilizers. The demand statements in both the cases were however over-estimated and the societies actually lifted less than what was allotted to them.

Figures regarding actual supplies of seeds, fertilizers and plant protection chemicals to the service societies from the two taluka agricultural marketing co-operative societies of Pandavapura and Srirangapatna are given in

Table 1.13 : Short term loans sanctioned to different societies in Pandavapura taluka for the Kharif season of 1966-67 and the recoveries as on 31-12-1966

Name of the Service Co-operative Society	Issued (Rs.)	Collection (Rs.)	Balance (Rs.)
Pandavapura Kasaba	1,05,873	4,860	1,01,013
Kennalu	1,57,903	45,464	1,12,339
Narayanapura	28,261	-	28,261
Chittanahalli	42,904	-	42,904
Aralakuppe	55,590	1,550	54,050
Belaghatta	9,460	-	9,460
Telekere	8,115	500	7,615
Nyamanahalli	7,986	-	7,986
Shamburahalli	23,555	350	23,205
Bindahalli	18,997	-	18,997
Dinka	29,352	1,300	28,052
Kanaganamaradi	46,540	1,912	44,628
Melkote	7,130	600	6,530
Amruthi	10,640	-	10,640
Kanaganahalli	18,300	-	18,300
Manikanahalli	22,089	-	22,089
Chikkade	1,43,884	62,084	81,800
Kadalagere	3,825	-	3,825
Doddaboganahalli	12,201	332	11,869
Chinkurli	8,686	1,222	7,464
Bannangadi	10,587	850	9,737
Kalenahalli	18,169	3,500	14,669
Kyathanahalli	87,921	1,469	86,452
K. Bettahalli	44,000	5,679	38,321
T. S. Chatra	44,880	-	44,880
Baby	12,700	30	12,670
Chikkayarahalli	40,700	-	40,700
Sunkathonnur	27,525	6,646	20,879
Ragimuddanahalli	16,300	2,001	14,299
Helebeedu	20,400	-	20,400
Katteri	14,000	-	14,000
Lakshmisagara	52,100	10,000	42,100
Sanaba	29,200	3,107	26,093
Haravu	15,800	5,700	10,100
Total	11,95,566	1,59,156	10,36,410

Table 1.14 : Short term loans sanctioned to different societies in Srirangapatna taluka for the Kharif season of 1966-67 and the recoveries as on 31-12-1966

Name of the Service Co-operative Society	Issued (Rs.)	Collection (Rs.)	Balance (Rs.)
Darasaguppe	3,20,875	10,721	3,10,154
Doddapalya	38,436	6,059	32,377
K. Setthahalli	2,47,960	37,960	2,10,000
Palahalli	1,09,561	10,600	98,961
Hosahalli	63,575	20,071	43,504
Srirangapatna	72,833	22,014	50,729
Gamanahalli	42,798	-	42,798
Melapura	29,215	3,033	26,182
Gendahosahalli	54,950	2,498	42,452
Mahadevapura	9,424	966	8,458
Mahadevapura	99,000	1,160	47,840
Jakkanahalli	19,600	-	19,600
Marasinganahalli	12,400	-	12,400
Naguvinahalli	35,100	-	35,100
Chikkankannahalli	47,900	1,013	46,887
Kodiyala	43,900	6,420	37,480
Total	11,97,527	1,22,605	10,74,922

Tables 1.15 and 1.16 respectively. Stock position of different types of fertilizers with the taluka marketing societies was good and the demand was adequately met. It should be however noted that some societies directly bought the high yielding variety seeds, phosphatic and potassic fertilizers and fertilizer-mixtures, and plant protection chemicals, without the mediation of the Taluka Marketing Co-operative Societies. By doing so, it was stated that the societies could reduce the prices of the respective items as the burden of the multi-stage sales tax, which is in vogue in Mysore, is reduced by direct dealing. For this reason only, many private dealers of the non-nitrogenous fertilizers and plant protection chemicals desired to deal directly with the service co-operatives.

Table 1.15: Supplies of seeds, fertilizers and plant protection chemicals to service societies from the Agricultural Marketing Co-operative Society, Pandavapura (1-1-1967 to 30-6-1967)

Item	Quantity (metric tons)	Value (Rs.)
Fertilizers		
Ammonium Sulphate	762.08	3,78,559
Urea	300.90	2,19,062
Superphosphate	130.00	46,035
Muriate of Potash	7.07	2,828
Seeds		
Rice Taichung-65	0.10	81
Plant Protection Chemicals	-	1,411

Table 1.16 : Supplies of seeds, fertilizers and plant protection chemicals to service societies from the Agricultural Marketing Co-operative Society, Srirangapatna (1-1-1967 to 30-6-1967)

Item	Quantity (metric tons)	Value (Rs.)
<u>Fertilizers</u>		
Ammonium Sulphate	752.00	3,29,069
Urea	227.30	1,67,041
Calcium Ammonium Nitrate	18.00	6,903
Superphosphate	304.00	1,00,215
<u>Seeds</u>		
Rice S.1092	1.89	1,834
S. 701	2.90	2,624
S.R. 26 B	1.99	1,809
Taichung-65	1.00	805
<u>Plant Protection Chemicals</u>	-	725

1.7. Organization of the Programme in the Selected Villages

In this section, we describe how the high yielding varieties programme was implemented at the village level. Three villages from Pandavapura taluka and two from Srirangapatna taluka were selected for the enquiry. The selected villages and their population as per the 1961 Census are listed below:-

	Population (1961)
<u>Pandavapura taluka</u>	
1. Kasba	7,508
2. Hiremarali	2,352
3. Chikkade	1,976
<u>Srirangapatna taluka</u>	
1. Palahalli	3,160
2. Majjigepura	283

Figures regarding the total cropped area and area under high yielding varieties in Rabi 1966-67 are given in Table 1.17. It is seen that the proportion of the area under Taichung-65 rice to total rice varied from 11.9 per cent for Palahalli in Srirangapatna taluka to 28.8 per cent in Chikkade in Pandavapura taluka. Kasba, consisting of Beerashettihalli, Hirode and Harohalli which are included in Pandavapura town, had 25 per cent of the rice area under Taichung-65 variety. The number of farmers growing Taichung-65 variety was the largest in Palahalli with 22 followed by Chikkade with 18. Hybrid jowar was grown by 9 farmers on 9 acres in Chikkade. In the other three villages, hybrid jowar was not grown. Hybrid maize was not grown in any of the selected villages.

Kasba and Hiremarali were covered by the Pandavapura Kasba LSCS while Chikkade was covered by the Chikkade SCS.

Table 1.17 : Area under high yielding varieties in the selected villages during Rabi 1966-67

	(Area in acres)				
	Selected villages in Pandavapura taluka			Selected villages in Srirangapatna taluka	
	Kasba	Hiremarali	Chikkade	Palahalli	Majjigepura
1. Total cropped area (1966-67)	694	992	915	1,005	379
2. Total cropped area in Rabi 1966-67	112	193	350	302	96
3. Area under total rice in Rabi 1966-67	83	109	118	210	80
4. Area under Taichung-65 in Rabi 1966-67	21	18	34	25	16
5. Area under hybrid jowar in Rabi 1966-67	-	-	9	-	-
6. (4) as per cent of (3)	25.3	16.5	28.8	11.9	20.0
7. (4) as per cent of (2)	18.7	9.3	9.7	8.3	16.7
8. (5) as per cent of (2)	-	-	2.5	-	-
9. Number of farmers growing Taichung-65 in Rabi 1966-67	8	9	18	22	16
10. Number of farmers growing hybrid jowar in Rabi 1966-67	-	-	9	-	-

Palahalli was covered by the Palahalli SCS and Majjigepura was covered by the Hosahalli SCS. Simple farm plans were written for the farmers growing Rabi crops (1966-67) in Chikkade and Majjigepura only. Rabi loan was advanced to the farmers in these two villages but the figures regarding the amount so advanced were not readily available. The allotment of the nitrogenous fertilizers to these societies for the Summer 1967 season is as noted below:

Society	Nitrogenous fertilizers (metric tons)		
	A.S.	U.	C.A.N.
Pandavapura Kasba	30	10	-
Chikkade	130	54	-
Palahalli	64	31	4
Hosahalli	-	-	-

It was only in Chikkade and Palahalli villages that the nitrogenous fertilizers were made available in sufficient quantity to the farmers growing Summer crops. In Pandavapura Kasba farmers were supplied with nitrogenous fertilizers from the old stock and there was no complaint by any farmer about the shortage of nitrogenous fertilizers. Hosahalli SCS did not buy any quantity of nitrogenous fertilizers during the season and it is not known whether the supply was made available through the previous stocks. Phosphatic and potassic fertilizers as well as fertilizer mixtures were stocked by the first three societies and were distributed among the farmers.

The Pandavapura LSCS processed Taichung-65 seed and supplied to many other societies in Pandavapura, Srirangapatna and Krishmarajapet talukas. The taluka marketing society in Srirangapatna had also stocked Taichung-65 seeds. All the farmers who wished to grow Taichung-65 rice were supplied with the seed.

Plant protection chemicals were bought from the taluka marketing society in the case of the Srirangapatna villages and mainly from the private dealers in the case of the Pandavapura villages.

Those farmers who were growing the high yielding varieties were expected to produce a certificate from the village level worker regarding the crop grown, acreage and the quantity of nitrogenous fertilizers required to the service society. The service societies supplied higher quotas of nitrogenous fertilizers to such farmers.

PART II

WORKING OF THE PROGRAMME AT THE FARMERS' LEVEL

2.1. Selection of the Farmers

The working of the programme at the farmers' level was studied by collecting information at the village level from the village records, from the records of the service co-operatives at the village level and also through a sample survey of the cultivators. The sample of the cultivators selected for the study included 60 participants in the HVVP and 46 non-participants--in all 100 cultivators in the district.

It was decided to select two talukas for an intensive study and from each taluka, two villages for selecting the sample farmers. In each of the selected villages, it was decided to take a sample of 15 participant farmers and 10 non-participant farmers. As stated in Section 1.3, Pandavapura and Srirangapatna talukas were selected for a detailed enquiry as the area under Taichung-65 rice in those two talukas was quite high. Subsequently, in Section 1.6, a detailed account of the organization of the high yielding varieties programme was presented.

We were to select two villages from each taluka. As seen in Section 1.7, we however had to select three villages from Pandavapura taluka and two villages from Srirangapatna taluka. In Pandavapura taluka, we could find only one village, namely, Chikkade, where there were more than 15 participants. We had therefore to select two other villages, namely, Kasba and Hiremarali from which we could combinedly draw a sample of 15 participants and 10 non-participants. From Srirangapatna taluka, we selected two villages, namely, Palahalli and Majjigepura, and from each of these villages a sample of 15 participants and 10 non-participants was drawn. In all there were 100 farmers, 60 participants and 40 non-participants, selected for the study in the district.

The procedure followed in selecting the farmers was according to the method known as stratified random sampling. All the participants in each of the selected villages were arranged in a descending order according to their respective area under Taichung-65 paddy and the population was divided into five equal groups. From each of these stratified groups, three farmers were randomly selected. In the case of non-participants, the farmers growing local paddy in each village were arranged in a descending order according to their respective size of holding and were divided into five groups. From each group, two farmers were randomly selected. In Kasba and Hiremarali villages, the selection of the participants was made jointly, whereas for the non-participants, only five farmers were selected from each village. Table 2.1 presents the figures in respect of the selection of the farmers in different villages. A schedule was canvassed to all the 100 farmers so selected and the relevant data on land utilization, farm inputs for different crops, credit arrangement production and marketing of farm products and the opinion of the farmers regarding the growing of Taichung-65 variety were collected. The schedule is presented at the end of this report.

Table 2.1 : Selection of the farmers in different villages

Taluka	Village	Participants		Non-participants		Total number of selected farmers
		Total	Selected	Total	Selected	
Pandavapura	Kasba	8	8	97	5	13
	Hiremarali	9	7	138	5	12
	Chikkade	18	15	143	10	25
Srirangapatna	Palahalli	22	15	215	10	25
	Majjigepura	16	15	61	10	25
Total		73	60	654	40	100

2.2. Characteristics of the Selected Farmers

In Table 2.2, the selected farmers are distributed according in four groups according to size holding, namely, holdings over 15.1 acres, 10.1 to 15.0 acres, 5.1 to 10.0 acres, and below 5.0 acres. We presume that the first size group represents the big farmers and the second and the third size groups represent the upper medium and the lower medium farmers respectively. The fourth group consists of the small farmers. About two-thirds of the selected farmers, both participants and non-participants are either lower medium farmers or small farmers. The size of holding pattern of the selected farmers in different villages, for both participants and non-participants, roughly remain the same for all the selected villages. This shows that lower medium and small farmers in all the selected villages participated in the high yielding varieties programme and any hypothesis that only bigger farmers participate in the programme is proved to be wrong.

Frequency distribution of the selected farmers according to caste showed that out of 60 participants, 47 were Vakkaligas, 4 Brahmins, 1 Kuruba, 2 untouchables, 1 Vaishya, 1 Mudaliyar, 3 Muslims and 1 Christian. Of the 40 non-participants, 34 were Vakkaligas, 2 Brahmins, 2 untouchables, 1 Vaishya and 1 Muslim. Vakkaligas constitute the bulk of the farm population and it is believed that they are proportionately represented in our sample.

It was hypothesized that the part-time farmers who pursued some other occupation like trade, service, etc. along with farming were better adopters of the innovations in farming because: (i) extra financial resources are available to them; (ii) they are better educated; and (iii) their contacts with the extension officials are better. The classification of the participants and the non-participants according to full-time and part-time farming would show to what extent the part-time farming influenced the rate of participation in the HYVP. The number of part-time farmers, i.e. those who pursued some other occupation along with farming, was 8 out of 60 in the case of participants and 3 out of 40 in the case of non-participants. This shows that the part-time farming influenced the participation rate in a very small way.

Table 2.2 : Selected farmers according to size of holding

Size of holding (acres)	Participant or non-participant	No. of farmers					Total number of selected farmers
		Pandavapura Taluka		Srirangapatna Taluka			
		Kasba Hiremarali	Chikkade	Palahalli	Majjigepura		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
15.1 & above	P	1	2	2	3	1	9
	NP	1	1	2	1	1	6
10.1 - 15.0	P	2	1	3	2	3	11
	NP	1	1	2	1	2	7
5.1 - 10.0	P	2	2	5	7	6	22
	NP	2	1	4	3	4	14
Upto 5.0	P	3	2	5	3	5	18
	NP	1	2	2	5	3	13
Total	P	8	7	15	15	15	60
	NP	5	5	10	10	10	40

In Table 2.3, figures are given in respect of average size of cultivated holding, of which owned, area irrigated and area sown more than once for the participants and the non-participants in the selected villages. Average size of land holding for all the selected villages was 9.37 acres for the participants and 8.68 acres for the non-participants. It varied from 6.25 acres for Hiremarali to 13.49 acres for Majjigepura in the case of participants and from 6.14 acres for Chikkade to 17.92 acres for Majjigepura in the case of non-participants. The proportion of the land owned to the total cultivated holding was 0.80 for participants and 0.83 for non-participants for all the selected villages. These proportions varied from 0.59 for Palahalli to 0.98 for Majjigepura in the case of participants and from 0.65 to 0.98 for the respective villages in the case of non-participants. The irrigated area varied between 3.80 acres and 8.09 acres though the average size of cultivated holding varied within a wide range from 6.14 to 17.92 acres. The proportion of the area irrigated to the total cultivated area was 0.72 for the participants and 0.63 for the non-participants for all the selected villages in the district. The proportions, however, varied from 0.54 for Majjigepura to 0.83 for Chikkade in the case of participants and 0.38 for Majjigepura to 0.85 for Palahalli in the case of non-participants. The proportion of area sown more than once to the total cultivated area was 0.54 for participants and 0.48 for the non-participants in the case of the district whereas the proportions varied from 0.38 for Kasba to 0.62 for Palahalli in the case of participants and 0.31 for Hiremarali to 0.67 for Palahalli in the case of non-participants.

Table 2.3 : Land utilization in the selected villages

Village	Participants or Non-participants	(Area in acres)						
		Average size of cultivated holding	Of which owned	Proportion of (4) to (3)	Area irrigated	Proportion of (6) to (3)	Area sown more than once	Proportion of (8) to (3)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Pandavapura								
Kasba	P	7.20	6.17	0.82	5.33	0.74	2.74	0.38
	N	7.51	6.38	0.85	5.00	0.67	3.40	0.45
Hiremarali	P	6.25	5.75	0.92	4.07	0.65	2.85	0.46
	N	6.30	6.05	0.96	3.80	0.60	1.93	0.31
Chikkade	P	6.83	5.94	0.87	5.83	0.83	3.79	0.55
	N	6.14	5.21	0.85	3.92	0.64	2.21	0.36
Palahalli	P	9.92	5.90	0.59	8.09	0.82	6.18	0.62
	N	8.02	5.18	0.65	6.85	0.85	5.37	0.67
Majjigepura	P	13.49	13.29	0.98	7.32	0.54	6.64	0.49
	N	17.92	17.58	0.98	6.83	0.38	6.58	0.37
All villages	P	9.37	7.54	0.80	6.71	0.72	5.02	0.54
	N	8.68	7.20	0.83	5.51	0.63	4.14	0.48

Table 2.4 gives figures in respect of the average size of holding, of which owned, area irrigated and area sown more than once according to size of holding groups. The proportion of area owned to the cultivated area varied from 0.74 for small farmers to 0.83 for big farmers in the case of participants and from 0.51 for small farmers to 0.94 for big farmers. The proportion of area irrigated to the total cultivated area varied from 0.65 for upper medium farmers to 0.88 for small farmers in the case of participants and from 0.65 for upper medium farmers to 1.00 for small farmers in the case of non-participants. The proportion of area sown more than once to the cultivated area varied from 0.44 for upper medium farmers to 0.71 for small farmers in the case of participants and 0.31 for big farmers to 0.56 for small farmers in the case of non-participants. The analysis shows that the small farmers, both participants and non-participants, had smaller proportion of area owned and at the same time, larger proportion of the area irrigated and the area sown more than once. The area irrigated and the area sown more than once also appear to be highly associated.

Table 2.4 : Land utilization according to size of holding groups

Size of holding	Participants or non-participants	(Area in acres)						
		Average size of cultivated holding	Of which owned	Proportion of (4) to (3)	Area irrigated	Proportion of (6) to (3)	Area sown more than once	Proportion of (8) to (3)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
15.1 & above	P	22.55	18.79	0.83	16.11	0.71	11.18	0.49
	N	21.78	20.38	0.94	12.84	0.59	6.81	0.31
10.1 - 15.0	P	12.46	10.01	0.80	8.16	0.65	5.47	0.44
	N	13.75	12.62	0.92	7.75	0.56	6.18	0.45
5.1 - 10.0	P	7.41	5.79	0.78	5.09	0.69	3.39	0.46
	N	7.60	5.91	0.78	5.25	0.69	3.65	0.48
Upto 5.0	P	3.18	2.37	0.74	2.79	0.88	2.26	0.71
	N	3.44	1.75	0.51	3.44	1.00	1.94	0.56
Total	P	9.37	7.54	0.80	6.71	0.72	5.02	0.54
	N	8.68	7.20	0.83	5.51	0.63	4.14	0.48

Table 2.5A presents the utilization of the gross cultivated area of the selected families according to size of holding groups. On an average 54 per cent of the gross cultivated area of the participants was used for the Kharif crops and the corresponding percentage for the Rabi and the annual crops were 35 and 11 respectively. In the case of the non-participants, 60 per cent of the area was used for the Kharif crops, 30 per cent for the Rabi crops and 10 per cent for the annual crops. A major part of the area under the annual crops was under sugarcane. The percentage area under the Kharif crops and the annual crops did not vary much for different size of holding groups whereas in the case of the Rabi crops, small farmers, both participants and non-participants, had larger percentage of area than the rest of the farmers.

In the case of the Kharif season, as Table 2.5B shows, 62 per cent of the cropped area of the participants was under local paddy, 28 per cent under Ragi and 8 per cent was under other minor crops like horse gram, chilly, fodder jowar etc. The area under Taichung-65 paddy was only 1.5 per cent of the total cropped area during the season. For the non-participants, 57 per cent of the total cropped area during the season was under local paddy, 31 per cent under Ragi and about 12 per cent under the other minor crops. Between the different size of holding groups, there was not any significant variation in those percentages either for participants or non-participants.

In the Rabi season, the participants reported 29 per cent of the area under Taichung-65 paddy, 15 per cent under the local paddy, 13 per cent under the irrigated Ragi and 43 per cent under other minor crops like horse gram and fodder jowar, as seen in Table 2.5C. In the case of the non-participants,

Table 2.5A : Distribution of gross cultivated area (1966-67) according to Kharif, Rabi and the annual crops for the selected families

(Figures in acres)					
Size of holding	Parti- cipants or Non- parti- cipants	Total cultivated area (average per family)			
		Kharif	Rabi	Annual crops	Total gross cultivated area
(1)	(2)	(3)	(4)	(5)	(6)
15.1 and above	P	16.32 (53.65)	11.18 (36.75)	2.92 (9.60)	30.42 (100.00)
	N	17.28 (61.89)	6.81 (24.39)	3.83 (13.72)	27.92 (100.00)
10.1 - 15.0	P	10.04 (57.63)	5.47 (31.40)	1.91 (10.97)	17.42 (100.00)
	N	11.81 (60.01)	6.18 (31.40)	1.69 (8.59)	19.68 (100.00)
5.1 - 10.0	P	5.91 (55.08)	3.39 (31.59)	1.43 (13.33)	10.73 (100.00)
	N	6.80 (58.37)	3.65 (31.33)	1.20 (10.30)	11.65 (100.00)
Upto 5.0	P	2.61 (48.42)	2.26 (41.93)	0.52 (9.65)	5.39 (100.00)
	N	3.05 (56.69)	1.94 (36.06)	0.39 (7.25)	5.38 (100.00)
Total	P	7.29 (54.28)	4.68 (34.85)	1.46 (10.87)	13.43 (100.00)
	N	7.14 (59.55)	3.56 (29.69)	1.29 (10.76)	11.99 (100.00)

Note : Figures in the brackets are percentages of gross cultivated area in each row.

Table 2.5B : Crop pattern of the selected families in Kharif 1966-67

(Figures in acres)

Size of holding	Parti- cipants or Non- parti- cipants	Area under Kharif Crops (average per family)				
		Rice (T-65)	Rice (local)	Ragi	Other crops	Total
(1)	(2)	(3)	(4)	(5)		
15.1 & above	P	-	10.49 (64.27)	4.75 (29.10)	1.08 (6.62)	16.32 (100.00)
	N	-	9.05 (52.37)	5.54 (32.06)	2.69 (15.57)	17.28 (100.00)
10.1 - 15.0	P	0.08 (0.80)	6.19 (61.65)	2.57 (25.60)	1.20 (11.95)	10.04 (100.00)
	N	-	6.18 (52.33)	4.63 (39.20)	1.00 (8.47)	11.81 (100.00)
5.1 - 10.0	P	-	3.50 (59.22)	1.99 (33.67)	0.42 (7.11)	5.91 (100.00)
	N	-	4.35 (64.94)	1.73 (25.48)	0.72 (10.58)	6.80 (100.00)
Upto 5.0	P	0.24 (9.19)	1.68 (64.36)	0.47 (18.01)	0.22 (8.44)	2.61 (100.00)
	N	-	1.77 (58.03)	0.86 (28.19)	0.42 (13.78)	3.05 (100.00)
Total	P	0.11 (1.51)	4.53 (62.14)	2.06 (28.26)	0.59 (8.09)	7.29 (100.00)
	N	-	4.07 (57.00)	2.18 (30.53)	0.89 (12.47)	7.14 (100.00)

Note : Figures in the brackets are percentage of total cultivated area for Kharif in each row.

Table 2.5C : Crop pattern of the selected families in Rabi
1966-67

(Figures in acres)						
Size of holding	Parti- cipants or Non- parti- cipants	Area under Rabi Crops (average per family)				
		Rice (T-65)	Rice (local)	Ragi	Other crops	Total
(1)	(2)	(3)	(4)	(5)	(6)	(7)
15.1 & above	P	3.30 (29.52)	1.02 (9.12)	1.06 (9.48)	5.80 (51.88)	11.18 (100.00)
	N	-	1.58 (23.20)	1.83 (26.87)	3.40 (49.93)	6.81 (100.00)
10.1 - 15.0	P	1.51 (27.60)	0.22 (4.01)	0.75 (13.71)	2.99 (54.68)	5.47 (100.00)
	N	-	1.75 (28.32)	1.50 (24.27)	2.93 (47.41)	6.18 (100.00)
5.1 - 10.0	P	0.91 (26.84)	0.81 (23.89)	0.57 (16.81)	1.10 (32.46)	3.39 (100.00)
	N	-	0.90 (24.66)	1.12 (30.68)	1.63 (44.66)	3.65 (100.00)
Upto 5.0	P	0.69 (30.53)	0.68 (30.09)	0.39 (17.26)	0.50 (22.12)	2.26 (100.00)
	N	-	0.53 (27.32)	0.57 (29.38)	0.84 (43.30)	1.94 (100.00)
Total	P	1.35 (28.85)	0.71 (15.17)	0.62 (13.25)	2.00 (42.73)	4.68 (100.00)
	N	-	0.90 (25.28)	1.01 (28.37)	1.65 (46.35)	3.56 (100.00)

Note : Figures in the brackets are percentages of total cultivated area for Rabi in each row.

25 per cent of the area was under the local paddy, 28 per cent under the irrigated Ragi and 46 per cent under the other minor crops. The percentage area under total paddy (both Taichung-65 and the local varieties) was remarkably higher in the case of the participants than in the case of the non-participants. Among the different size of holding groups, the small and the lower medium farmers reported a significantly higher percentage of the area under total paddy than the upper medium and the big farmers. The percentage area under the irrigated Ragi was remarkably higher in the case of the non-participants than in the case of the participants, which apparently shows that there was a significant shift of the area under irrigated Ragi to paddy in the case of the participants.

2.3. Cash Expenditure for Production of Taichung-65 and Other Local Varieties

A comparison of the cash expenditure pattern of production of Taichung-65 paddy and that of the other local varieties shows an increase in the extent of cash requirement by the farmers for replacing the local varieties by the Taichung-65 variety. Tables 2.6 and 2.7, which give the data in respect of the current farm expenditure in cash for the Taichung-65 variety and the other local varieties respectively, show that there is remarkable increase in some of the items of costs. These two tables give the cash expenditure per acre for the items like seed, chemical fertilizers, organic manures, irrigation expenses, land revenue and cess, rent paid to landlord, pesticides, human labour and bullock labour for the Taichung-65 and the local varieties respectively. As rent paid to the landlord was in kind, it is not accounted here. The information is given according to the size of cultivated holding groups and are presented separately for the participants and the non-participants. An itemwise comparison of the per acre cash expenditure incurred on the production of the Taichung-65 variety and the local varieties is presented below:-

(a) Seed :- The cash expenditure on seed was Rs.14.30 per acre in the case of the Taichung-65 variety whereas in the case of the local varieties, it was Rs.12.81 and Rs.13.05 for the participants and the non-participants respectively. In the case of the Taichung-65 seed, out of 60 participant farmers selected for our enquiry, 54 farmers reported that they bought the seed either from the co-operatives or the private individuals. Only 6 farmers reported that they used the seed which they had grown on their own farms previously. In the case of the local varieties, out of 43 participants who reported growing some local variety along with the Taichung-65 variety, 38 reported that they bought seed from outside and only 5 reported that they used the seed produced on their own farms. In the case of the non-participants, out of 40 farmers, 29 bought seed from outside whereas 11 used their own seed. The variation in expenditure on seed for different size of holding groups was not significant either for the varieties or for the participants and non-participants. The cash expenditure on seed did not vary considerably between the Taichung-65 and the local varieties mainly because even the seed of the local varieties was purchased by quite a big proportion of the farmers because most of the local varieties grown were the improved varieties introduced by the 'package' office during the recent years.

Table 2.6 : Current farm expenditure in cash for paddy (Taichung-65) - Rabi 1966-67

Size of holding group (acres)	Parti- cipants or Non-parti- cipants	Area (acres)	Cash expenditure per acre (in Rs.)									
			Seed	Chemical fertili- zers	Organic manures	Irri- gation expen- ses	Land revenue	Rent paid to land- lord	Pesti- cides	Human labour	Bullock labour	Total expendi- ture
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
15.1 and above	P N	36.40	15.00	188.77	26.04	30.00	18.00	-	13.77	189.17	-	480.75
10.1 - 15.0	P N	15.25	14.40	162.12	27.36	30.00	18.00	-	14.47	182.96	-	449.31
5.1 - 10.0	P N	20.05	15.20	131.16	20.45	30.00	18.00	-	10.82	145.00	16.23	386.86
Upto 5.0	P N	14.42	13.10	149.32	24.57	30.00	18.00	-	13.00	153.31	25.11	426.41
Total	P N	86.12	14.30	151.85	23.84	30.00	18.00	-	12.61	161.24	13.81	425.65

Table 2.7 : Current farm expenditure in cash for paddy (local varieties) - Rabi 1966-67

Size of holding group (acres)	Parti- cipants or Non-parti- cipants	Area (acres)	Cash expenditure per acre (in Rs.)									
			Seed	Chemical ferti- lizers	Organic manures	Irriga- tion expen- ses	Land revenue and cess	Rent paid to land- lords	Pesti- cides	Human labour	Bullock labour	Total expendi- ture
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
15.1 and above	P	11.20	12.13	112.61	17.12	30.00	18.00	-	12.41	89.41	-	291.48
	N	9.50	13.11	97.43	18.23	30.00	18.00	-	14.63	86.29	-	277.69
10.1 - 15.0	P	2.17	13.02	133.05	16.45	30.00	18.00	-	13.92	88.13	-	312.57
	N	7.00	13.00	106.13	17.03	30.00	18.00	-	11.06	87.15	-	282.37
5.1 - 10.0	P	17.90	12.88	92.10	5.05	30.00	18.00	-	14.89	86.91	18.03	277.86
	N	12.70	12.92	81.80	7.13	30.00	18.00	-	10.01	82.81	16.91	259.58
Upto 5.0	P	14.40	13.00	104.00	13.18	30.00	18.00	-	11.90	85.46	23.48	299.02
	N	6.85	13.19	101.17	12.93	30.00	18.00	-	10.82	82.25	29.36	297.72
Total	P	45.67	12.81	105.92	11.57	30.00	18.00	-	13.33	87.03	13.90	292.56
	N	36.05	13.05	93.31	10.96	30.00	18.00	-	10.89	83.91	15.46	275.58

(b) Chemical fertilizers :- For the Taichung-65 variety, the per acre cash expenditure on chemical fertilizers was Rs.151.85 whereas for the local varieties, it was Rs.105.92 and Rs.93.30 for the participants and the non-participants respectively. In the case of the Taichung-65 variety, the per acre cash expenditure varied from Rs.131.16 for the lower medium farmers to Rs.188.77 for the big farmers. For the local varieties, the variation in the expenditure on chemical fertilizers due to size of holding groups was not very remarkable. An important thing to be noted was that all the participants reported the use of chemical fertilizers on both Taichung-65 and the local varieties whereas 37 out of 40 non-participants reported the use of chemical fertilizers.

(c) Organic manures :- Except in Palahalli in Srirangapatna taluka, which is situated very close to Mysore city, in all the other villages, the organic manure used was in the form of farmyard manure. In a very few cases, the use of the green manure was reported in all the selected villages. In Palahalli, along with the farmyard manure, the farmers used the urban waste as an organic manure.

The per acre cash expenditure on the organic manure was Rs.23.84 for the Taichung-65 variety whereas it was Rs.11.57 and Rs.10.96 for the participants and the non-participants respectively in the case of the local varieties. In the case of Taichung-65 variety the per acre expenditure on the organic manures did not vary remarkably for the size of holding groups whereas for the local varieties, it varied from Rs.92.10 for the lower medium farmers to Rs.133.05 for the upper medium farmers in the case of the participants and from Rs.81.80 for the lower medium farmers to Rs.106.13 for the upper medium farmers in the case of the non-participants. The inconsistency in the variations according to size of holding groups can be explained by the extent of the availability of the organic manures in the different villages.

(d) Irrigation expenses :- The water tax charges by the Canal authorities was Rs.30 per acre in the case of paddy. We have taken this rate uniformly for all the size groups because apparently there is no reason for any variation in this rate due to change in the size of holding.

(e) Land revenue and cess :- The rate of land revenue varied from village to village and from plot to plot depending upon the fertility of the soil and the type of irrigation available. In our enquiry, we had asked the farmers to report about the land revenue and the cess paid by them for the different plots on which different crops were grown. The farmers however could not respond to the question as many of them did not know the amount of land revenue and the cess they paid for the different plots. We therefore collected the total land revenue and the cess paid by the farmers which was easier for him to report. Those figures however were not useful for our purpose as they represented the averages for both the wet and the dry lands. On the basis of the village records, we therefore worked out an average rate of Rs.18 per acre in the case of paddy land. This rate included the land revenue as well as the cess charged by the State government during the year of enquiry. We have adopted this rate uniformly for all the size groups.

(f) Pesticides :- Pesticides were used for both the Taichung-65 variety and the local varieties. For the

Taichung-65 variety per acre cash expenditure on pesticides was Rs.12.61 whereas, in the case of the local varieties, it varied from Rs.13.33 for the participants to Rs.10.89 for the non-participants. Variations due to size of holding either in the case of the variety or the participants and non-participants are not meaningful and it is not possible to explain them.

(g) Human labour :- Per acre cash expenditure on human labour was Rs.161.24 for the Taichung-65 variety and in the case of the local varieties, it is Rs.87.03 for the participants and Rs.83.91 for the non-participants. These expenses varied from Rs.145.00 for the lower medium farmers to Rs.189.17 for the big farmers in the case of the Taichung-65 variety. On the other hand, for the local variety, the variation due to size of holding was not very remarkable.

It is clear from the figures given in Tables 2.6 and 2.7 that the per acre expenditure on human labour for the Taichung-65 variety was nearly double that of the local varieties. Which are the operations where the expenditure on human labour varies widely for the Taichung-65 variety and the local varieties, is a pertinent question seeking the pattern of differential human labour investment for the two varieties. Table 2.8, which gives operationwise cash expenditure on human labour for the Taichung-65 variety and the other local varieties answers this question satisfactorily.

Table 2.8 : Operationwise cash expenditure on human labour for paddy (Taichung-65) and paddy (local varieties) Rabi 1966-67

Operations	Expenditure per acre in Rs.					
	Paddy (Taichung-65)			Paddy(local varieties)		
	Cash	Kind	Total	Cash	Kind	Total
Pre-sowing tillage	18.20	-	18.20	18.13	-	18.13
Transporting and spreading F.Y.M.	15.14	-	15.14	13.08	-	13.08
Preparation of seedlings	-	5.00	5.00	-	5.11	5.11
Transplantation	-	31.13	31.13	-	32.89	32.89
Watering	3.00	-	3.00	2.96	-	2.96
Weeding	15.00	-	15.00	15.25	-	15.25
Spreading fertilizers	5.00	-	5.00	5.00	-	5.00
Harvesting	-	21.73	21.73	-	19.82	19.82
Threshing	55.67	-	55.67	16.18	-	16.18
Winnowing	18.10	-	18.10	15.23	-	15.23
Guarding from birds	31.13	-	31.13	-	-	-
Total	161.24	57.86	219.10	85.83	57.82	143.65

It is only in the case of two operations, namely, threshing and guarding from birds that the average expenditure on human labour per acre for the Taichung-65 variety varied significantly from that on the local varieties. Per acre expenditure on human labour for the threshing operation was Rs.55.67 for the Taichung-65 variety whereas it was only Rs.16.18 for

the local varieties. The Taichung-65 variety is not a shedding variety as is the case with the local varieties and hence there was a significantly higher cost on human labour for the threshing operation. In the case of the guarding operation, average expenditure per acre was Rs.31.13 for the Taichung-65 variety whereas it was nil for the local varieties. As the former matures earlier the menace from the birds was highly concentrated in that case and the farmers were required to incur huge expenditure on the guarding operation.

(h) Bullock labour :- Cash expenditure on bullock labour was reported by only the small and the lower medium farmers. In the case of the Taichung-65 variety, cash expenditure on bullock labour was Rs.13.81. For the size of holding groups, it varied from nil in the case of the big and the higher medium farmers to Rs.16.23 and Rs.25.11 for the lower medium and the small farmers respectively. For the local varieties, per acre cash expenditure on bullock labour varied from Rs.13.90 for the participants to Rs.15.46 for the non-participants. Variation due to size of holding was almost in the same way as in the case of the Taichung-65 variety.

(i) Total expenditure :- Per acre total cash expenditure for the Taichung-65 variety was Rs.425.65. It was the lowest for the lower medium farmers (Rs.386.86) and the highest for the big farmers (Rs.480.75). Variation in the expenditure pattern was, as already seen, in respect of cash expenditure on the chemical fertilizers and the human labour. In the case of the local varieties, total per acre cash expenditure was Rs.292.56 for the participants and Rs.275.58 for the non-participants. Unlike in the case of the Taichung-65 variety, variation due to size of holding was not remarkable for the local varieties either for the participants or for the non-participants.

2.4. Credit Availability for Crop Production

Farmers needed credit for meeting the cash expenses required for carrying on different agricultural operations. The credit co-operatives and the moneylenders were the only two sources from which the farmers borrowed money for current expenditure on farm operations. The sugarcane growers, who were the shareholders in the sugar factory at Pandavapura got credit facilities from the sugar factory. It is really surprising that none of the selected farmers reported any borrowing from either the friends or the relatives. As the money borrowed in all the cases was with interest, it was quite possible that the friends or the relatives who lent money were probably brought under the category of the moneylenders.

As already mentioned in Part I, in Pandavapura taluka, Kasba and Hiremarali were covered by the Pandavapura LSCS whereas Chikkade was covered by the Chikkade SCS. In Srirangapatna taluka, Palahalli was covered by the Palahalli SCS and Majjigepura was covered by the Hosahalli SCS. Farmers mainly depended upon the co-operative credit during the Kharif season. In the Rabi season, the co-operative credit was made available to the farmers in Palahalli and Majjigepura villages only. The farmers in the other villages depended upon either the moneylenders or their own resources to meet the current cash requirement for crop

production. The moneylenders who advanced credit for current farm expenditure were none other than the big farmers or the traders. It was also noticed that most of the farmers who borrowed from the co-operatives simultaneously borrowed from the moneylenders as can be seen from Table 2.9 where the number of farmers borrowing from different sources is given.

Table 2.9 : Number of farmers borrowing from different sources

Size of holding (acres)	Participants or Non-participants	Total number of farmers	Farmers borrowing for Kharif crops			Farmers borrowing for Rabi crops			Farmer borrow- ing for sugar- cane
			Co- operative	Money- lender	Total	Co-opera- tives	Money- lenders	Total	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
15.1 and above	P	9	8	4	8	8	1	8	3
	N	6	6	1	6	-	2	2	2
10.1 - 15.0	P	11	5	6	7	5	7	7	6
	N	7	4	3	5	1	2	3	1
5.1 - 10.0	P	22	16	5	18	6	5	9	3
	N	14	14	3	14	3	7	8	4
Upto 5.0	P	18	11	6	13	5	8	10	4
	N	13	12	3	12	-	3	3	1
Total	P	60	40	21	46	24	21	34	16
	N	40	36	10	37	4	14	16	8

In the Kharif season for instance, out of the 60 participants, 40 borrowed from the co-operatives and 21 from the moneylenders. The total number of participants who borrowed credit during the Kharif season was however only 46, which shows that a majority of the farmers who borrowed from the co-operatives borrowed from the moneylenders too. The reason extended by the farmers for borrowing from both the sources was that the co-operative credit was not available in time.

The situation was not very much different for the Rabi season. Out of the 60 participants, 24 borrowed from the co-operatives and 21 from the moneylenders, whereas the total number of the participants who borrowed was 34. On the other hand, the non-participants borrowed mainly from the moneylenders during the Rabi season. Out of the 40 non-participants, only 4 borrowed from the co-operatives whereas the corresponding number of borrowers from the moneylenders was 14. This was due to the general policy followed by the co-operatives to advance credit mainly to the participants in the high yielding varieties programme.

Credit was not advanced either by the co-operatives or by the moneylenders for growing a particular crop. In the

simple farm plan, the credit requirement of the farmer was decided by looking to the multiple factors like total cropped area, crops grown and the actual need for credit. These simple farm plans were again scrutinized by the supervisor of the District Co-operative Bank and the total credit required was assessed on the basis of the previous experience of the bank in recovering the loan from the borrower. Moreover, according to a directive issued by the bank, none of the farmers was eligible for receiving an amount over Rs.700 as crop loan irrespective of the total cropped area or the crops grown. The rates of crop loan for different crops given in Table 1.12 simply served the purpose of working out the total credit requirement which was to be further scrutinized. It was therefore not possible for the respondents to report specifically the size of credit they were given for growing a certain crop. The private moneylenders also advanced credit to meet the general farm expenditure, including even the household consumption needs of the farmer and it was never advanced for growing a particular crop. It was only in the case of the sugarcane growers that the sugar factory advanced credit for the production of the sugarcane crop.

Table 2.10 presents the figures regarding per acre borrowings from different sources for the Kharif, the Rabi and the annual crops. In the case of the Kharif crops, per acre borrowings from the co-operatives and the moneylenders were Rs.42.18 and Rs.29.17 respectively for the participants and the corresponding figures for the non-participants were Rs.41.80 and Rs.27.63. The total borrowings per acre in the case of the Kharif crops were thus Rs.71.35 for the participants and Rs.69.43 for the non-participants. The variation in the per acre borrowings due to difference in the size of holding groups, either for the participants or for the non-participants was quite remarkable. Generally, bigger the size of holding, smaller were the per acre borrowings.

Table 2.10 : Per acre borrowings from different sources for Kharif, Rabi and annual crops

Size of holding (acres)	Participant or Non-participant	Per acre borrowings for Kharif crops (Rs.)			Per acre borrowings for Rabi crops (Rs.)			Per acre borrowings from sugar factory
		Co-operatives	Money-lenders	Total	Co-operatives	Money-lenders	Total	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
15.1 and above	P	24.61	17.20	41.81	37.87	1.61	39.48	112.36
	N	19.60	19.36	38.96	-	49.54	49.54	190.21
10.1 - 15.0	P	40.54	38.92	79.46	42.47	10.13	52.60	242.58
	N	35.24	78.55	113.79	6.17	49.38	55.55	163.49
5.1 - 10.0	P	60.27	31.29	91.56	20.60	20.88	41.48	121.79
	N	53.60	11.56	65.16	19.38	50.41	69.79	228.52
Upto 5.0	P	59.05	45.96	105.01	28.13	62.51	90.64	139.56
	N	80.65	28.00	100.65	-	15.94	15.94	89.64
Total	P	42.18	29.17	71.35	32.67	32.85	65.52	144.46
	N	41.80	27.63	69.43	3.80	43.46	47.26	185.83

In the case of the Rabi crops, the per acre borrowings from the co-operatives were Rs.32.67 for the participants and Rs.3.80 for the non-participants. As already stated, the bank had followed a general policy of accommodating the participants in the high yielding varieties programme only for advancing crop loan during the Rabi season. The per acre borrowings from the moneylenders were, on the other hand, Rs.32.85 for the participants and Rs.43.46 for the non-participants. The total borrowings per acre in the Rabi season were thus Rs.65.52 for the participants and Rs.47.26 for the non-participants. The total borrowings per acre roughly varied inversely with the size of holding.

The per acre borrowings from the sugar factory amounted to Rs.144.46 for the participants and Rs.185.83 for the non-participants. It was not possible to establish any relationship between the per acre borrowings and the size of holding groups. Besides the size of holding, probably there were some other factors influencing the per acre borrowing.

2.5. Differential Yield Rate and the Market Value of Taichung-65 and Other Local Varieties

The Taichung-65 variety was introduced in the district as a high yielding variety. The yield of the Taichung-65 variety at the Government Agricultural Experiment Stations was claimed to be as high as 25 quintals per acre. At the farmers' level, it was however found that the Taichung-65 variety gave a lower yield than the other local varieties as it can be seen from Table 2.11. The yield was lower both in the case of grain as well as straw. The grain yield of the Taichung-65 variety was 14.49 quintals whereas in the case of the local varieties, it was as high as 16.07 quintals per acre for the participants and 16.89 quintals per acre for the non-participants. The grain yield of the local varieties was thus 11.09 per cent higher than that of the Taichung-65 variety for the participants and 11.66 per cent higher in the case of the non-participants. The yield of the straw was 1.8 cartloads per acre in the case of the Taichung-65 variety whereas for local varieties it varied from 4.0 cartloads for the participants to 3.9 cartloads for the non-participants. In both the cases, the straw yield of the local varieties was more than double that of the Taichung-65 variety.

Besides having the disadvantage of lower grain yield in physical terms, the Taichung-65 variety was sold at lower price in the market as compared to the local varieties. This was because the local varieties were qualitatively far superior to the Taichung-65 variety. In July 1967, just one month after the harvesting of the Rabi crop, the market value of the Taichung-65 variety was Rs.52 per quintal whereas it varied from Rs.65 to Rs.72 per quintal in the case of the other local varieties. Even the government procurement rates fixed by the Food Corporation of India were Rs.46 per quintal in the case of the Taichung-65 variety and Rs.52 to Rs.56 per quintal for the other local varieties. If the value yield was taken into account, the Taichung-65 variety was more disadvantageous for the farmers to grow. The value of the yield of the local varieties was 38.6 per cent more than the Taichung-65 variety in the case of the participants and 45.7 per cent more in the case of the non-participants. In the case of the paddy straw, the local rate of Rs.20 per cartload was uniform for all the varieties and hence there was no price disadvantage for any of the variety.

Table 2.11 : Per acre yield of Taichung-65 and other local varieties of paddy

Size of holding (acres)	Participants or Non-participants	Per acre yield of Taichung-65				Per acre yield of other local varieties			
		Paddy		Straw		Paddy		Straw	
		Quantity (in quintals)	Value* (in Rs.)	Quantity (in quintals)	Value† (in Rs.)	Quantity (in quintals)	Value* (in Rs.)	Quantity (in quintals)	Value† (in Rs.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
15.1 and above	P	16.14	943.28	1.9	38.00	16.63	1080.95	3.6	72.00
	N	-	-	-	-	16.71	1086.15	4.1	82.00
10.1 - 15.0	P	13.89	722.28	1.7	34.00	17.08	1110.20	3.9	78.00
	N	-	-	-	-	16.94	1101.10	3.7	74.00
5.1 - 10.0	P	14.66	762.32	1.8	36.00	15.13	983.45	4.0	80.00
	N	-	-	-	-	17.23	1119.95	3.8	76.00
Upto 5.0	P	13.85	720.20	1.8	36.00	16.35	1062.75	4.4	88.00
	N	-	-	-	-	16.57	1077.05	4.3	86.00
Total	P	14.49	753.48	1.8	36.00	16.07	1044.55	4.0	80.00
	N	-	-	-	-	16.89	1097.85	3.9	78.00

Note :- * Market value of Taichung-65 was Rs.52 per quintal whereas it varied from Rs.65 to Rs.72 per quintal in the case of other local varieties.

+ Paddy straw was locally valued at Rs.20 per cartload.

2.6. Attitudes of the Farmers Growing Taichung-65

In the schedule canvassed to the selected farmers, a question was asked to the participants to report their experiences regarding the growing of the Taichung-65 variety. According to the opinions of a number of the farmers, growing of the Taichung-65 variety was not favoured as seen in Table 2.12. Eighty-eight per cent of the participant farmers reported that threshing was very difficult and required more labour. Damage from the birds at the time of seed formation was very high and the expenditure incurred on protecting the crop from birds was quite heavy as realised by 65 per cent of the participants. According to 73 per cent of the participants, grain yield of the Taichung-65 variety was not superior to that of the local varieties whereas 77 per cent found that the straw yield was very less. The fact that the Taichung-65 variety was costlier to grow was conceived by 68 per cent of the participants. Eighty-three per cent reported that the variety did not get good price in the market. All the participants reported that cooking of Taichung-65 rice was difficult and the cooked rice had neither taste nor keeping quality.

Table 2.12 : Opinions of the participants regarding the cultivation of the Taichung-65 paddy

Sr. No.	Opinions of the participants	Number of reporting farmers	Percentage to total participant
1	Threshing is very difficult and requires more labour	53	88
2	Damage from birds at the time of seed formation is very high. Expenditure incurred on protecting the crop from birds is quite high.	39	65
3	Yield of Taichung-65 is not superior to that of the local varieties	44	73
4	Yield of straw is very less	46	77
5	Grain yield is less due to inadequate supply of water	3	5
6	It is costlier to grow	41	68
7	The variety does not get good price in the market	50	83
8	Cooking is difficult. Cooked rice has neither taste nor keeping quality	60	100
9	Guidance from the 'package' office regarding the growing of Taichung-65 variety is not good	7	12
10	Wants to give one more trial	6	10
11	Does not wish to grow again	54	90

There were, however, a very few farmers who were not prepared to accept the opinion of the bulk of the participants that the variety was a complete failure. According to their opinion the grain yield was less due to inadequate supply of water. But generally the supply of water in the case of a few farmers was mainly due to the location of their individual farms. Some participants opined that the guidance from the 'package' office regarding the cultivation of the Taichung-65 variety was not adequate. With adequate supply of water in the canal and proper guidance from the 'package' office, they felt that the new variety may prove a success.

In short, 90 per cent of the participants did not wish to grow the Taichung-65 variety once again whereas only 10 per cent wanted to give one more trial to it.

PART III
CONCLUSIONS

The Mandya district was covered by the 'package' programme and the High Yielding Varieties Programme was introduced in the district as a part of the 'package' programme. As seen in Part I, the institutional arrangement for the supply of seeds, fertilizers and plant protection chemicals for the High Yielding Varieties Programme in the district was quite adequate.

The programme evidently proved to be a failure as many farmers who had grown the Taichung-65 variety in the Rabi season of 1966-67 were reluctant to grow it in the Kharif season of 1967-68. Some case studies were therefore made by the Agricultural Information Officer with a view to knowing the factors responsible for the general averseness of the farmers towards growing Taichung-65. Over a dozen Taichung-65 growers in different parts of the district were interviewed for the purpose.

The reasons for the unsatisfactory performance of the Taichung-65 were summarised in the PACKAGE NEWS LETTER Vol. 1, No. 7 as follows:

"The recommended package of practices like the age of the seedlings, spacing, dosage and time of application of fertilizers and timely irrigation were not followed.

"In cases where yield went down below 15 quintals (per acre), two factors were mainly responsible, viz., the seedlings were over 30 days old and only half of the recommended dosage of fertilizers was given during the Rabi while there was no such problem in respect of the Kharif crop."

In our enquiry with the selected farmers, we however found some other reasons for the non-acceptability of the Taichung-65 variety as seen in Part II. The following appear to be the most important among them:

- (a) It is costlier to grow.
- (b) Both grain yield and straw yield are less.
- (c) It does not get good price in the market.

(a) Cost of growing the Taichung-65 variety was Rs.425.65 per acre as compared to Rs.292.56 and Rs.275.58 for the participants and the non-participants respectively in the case of the local varieties. The cost was remarkably higher on the items like chemical fertilizers, organic manures and human labour. Further analysis of the cost items on human labour revealed that the difference was highly significant in the case of the operations like threshing and guarding from birds. The increased cost incurred on all these items was paid in cash. Net return per cash expenditure of Re.1.00 was only Re.0.85 in the case of the Taichung-65 variety whereas it varied from Rs.2.84 for the participants to Rs.3.27 for the non-participants in the case of the local varieties. In short, the farmers incurred more expenditure in cash for growing the Taichung-65 variety than they did for the local varieties.

The fact that it was costlier to grow the Taichung-65 variety was revealed by the opinions of the farmers presented in Section 2.6. According to an opinion expressed there, 68 per cent of the farmers were of the view that the Taichung-65 variety was costlier to grow. The increased costs incurred on the operations like threshing and guarding from the birds was an inhibiting factor for a large number of the participants to grow the Taichung-65 variety.

(b) The Taichung-65 variety was introduced in the district as a high yielding variety and it was expected to yield higher than the local varieties. It was however found that both the grain yield and the straw yield of the Taichung-65 variety were less than those of the local varieties as seen in Section 2.5. Under the prevailing soil and climatic conditions, the Taichung-65 variety had very poor performance even with increased production cost. This fact was revealed by the performance of the Taichung-65 variety at the district and the taluka levels. The package office had arranged the crop competition at the district and the taluka levels. In these competitions, none of the Taichung-65 variety growers could bag any of the prizes though some of them had grown the variety and followed the recommended practices very strictly with the intention of winning the prize. This shows that the Taichung-65 variety was less yielding than the local varieties even when the recommended practices were strictly followed.

(c) Most of the improved varieties introduced in the package programme were qualitatively far superior to the Taichung-65 and they fetched better price in the market. All the participants expressed a uniform opinion that the cooking of the Taichung-65 rice was difficult and the cooked rice had neither taste nor keeping quality. Looking to the difficulties of the farmers who mainly consumed rice, the Agricultural Information Officer published a note on "How to cook Taichung-65 rice?" in the PACKAGE NEWS LETTER, Vol. 1, No.2, which is reproduced below :

"The new variety of rice Taichung-65 has a complaint that it has a gummy texture and is not granular after it is cooked. For proper cooking, the following steps are to be taken.

"The care of the new rice lies in its pre-cooking treatment. If this rice is soaked in warm water for only 10 minutes, it absorbs water and does not dissolve while cooking. Do not over soak. While the rice is getting soaked in warm water, in another vessel, boil the quantity of water measured out according to the measured quantity of rice. If rice is one glass, the water should be two glasses. Put the soaked rice into the vessel with boiling water and keep that vessel inside a steam cooker. Rice is cooked within 20-25 minutes."

Farmers joked at these tips for cooking the Taichung-65 rice and said that instead of accepting these tips they preferred giving up the idea of growing the Taichung-65 variety.

On the other hand all the local varieties were of fine quality, with good taste. Because of this qualitative different the local varieties fetched Rs.13 to Rs.20 more per quintal than the Taichung-65 variety.

Farmers in Mandya had no bias towards any particular variety of seed. After the introduction of the package programme, evidently they had accepted many new strains which they found to be profitable. They did not need even much propaganda activity for the extension of any new variety which was really profitable for them to grow. An instance may be here quoted about a rice variety known as T.K.M.6 which was introduced in the district by an extension official in his non-official capacity. The variety was accepted on a mass scale within a short period of two years. Surprisingly, the variety was not recognized as an improved variety by the package office, and there was no propaganda activity to grow the variety, no seed-multiplication programme and no special recommendation of fertilizer dosage. The fact that still many farmers accepted the variety shows that farmers in Mandya do not need any propaganda activity for accepting innovations. On the other hand, they were influenced by the economic motive in the form of higher rate of profit in accepting new things. In the Kharif season of 1967-68, it was observed that none of the farmers in the selected villages grew Taichung-65 rice and very few were willing to grow it in the subsequent Rabi season. This shows that the Taichung-65 variety has failed in the district as it was proved to be relatively not profitable to grow.

A new variety of rice from Philippines, known as IR-8 has proved to be a high yielder and qualitatively also it is superior to Taichung-65. According to the field trials made by the Agricultural College, Hebbal, near Bangalore, the new variety IR-8 is found to be quite suitable to the soil and climatic conditions of the tract. In view of this a number of field trials of IR-8 may be programmed in different parts of the Mandya district and the relative profitability of the variety assessed. In case the variety IR-8 is found to be profitable to grow in the district, it should be programmed further for large scale extension. To conclude, while introducing any other high yielding variety of rice in the Mandya district, it should be seen whether the new variety would prove itself to be relatively profitable to grow.

APPENDIX

SCHEDULES USED IN THE FIELD INVESTIGATION

I. Listing Schedule

1. Village
2. Taluka/Block
3. District

Name of the head of the family	Area under paddy	Area under the other crops	Area under the HYVP	Whether member of the Credit Society Yes/No	Remarks
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II. Schedule for the participating and the non-participating families

1. Village
2. Taluka/Block
3. District
4. Name of the Cultivator
5. Caste
6. Date
7. Serial No.
8. Whether the cultivator had participated in the HYVP?
9. Whether the cultivator is a member of the Credit Society?

10. Occupations :

Principal :

Subsidiary :

11. Size of the household:

Earning persons :

Non-earning persons :

II. Land owned and cultivated (in acres):

1. Total owned land
2. Land leased out on cash rent
3. Land leased out on share rent
4. Owned and cultivated land
5. Land leased in on cash rent
6. Land leased in on share rent
7. Total cultivated land

8. Land Utilization (in acres)

Irrigated _____ Unirrigated _____ Current fallow _____
 Permanent fallow _____ Total _____

III. Cropping Pattern 1966-67 (in acres)

Name of the crop	Kharif		Name of the crop	Rabi			
	Irrigated	Unirrigated		Irrigated		Unirrigated	
				Total area	Double cropped area	Total area	Double cropped area

Area under the perennial crops

Name of the crop :

Area :

IV. Expenditure during 1966-67 over seeds, fertilizers, etc. and the sources of finance

Name of the crop	Area	Item	Total		Home produced		Purchased		Remarks
			Quantity	Value	Quantity	Value	Quantity	Value	

(Information on the following six items will be collected for each crop)

1. Seeds
2. Farm Yard Manure
3. Fertilizers
4. Pesticides
5. Land revenue
6. Rent

V. Expenditure over human labour and bullock labour

Name of the crop:

(Separate sheet to be used to note expenditure on each crop)

Operation of times performed	Number of times performed	Month	Wages paid to human labour			Wages paid to bullock labour		
			Cash	Kind		Cash	Kind	
				Type	Quantity		Type	Quantity

1. Pre-sowing tillage
2. Transporting and spreading F.Y.M.
3. Preparation of seedlings
4. Transplantation
5. Watering
6. Weeding
7. Spreading fertilizers
8. Harvesting
9. Threshing
10. Winnowing
11. Guarding from birds

VI. Other farm expenses

Item	Cash	Expenditure		Total
		Kind		
		Type	Quantity Value	
1. Fodder				
2. Feeds				
3. Hired bullock labour if any for other than crop production				
4. Wages paid to the permanent farm worker				
5. Others				

VII. Total expenditure (to be compiled from IV and V)

Item	Total expenditure in		
	Kind	Cash	Total
1. Seed			
2. Farm yard manure			
3. Fertilizers			
4. Pesticides			
5. Land revenue			
6. Rent			
7. Labour			
8. Other expenditure			
9. Total			

VIII. Current finance borrowed during the year:

	1	2	3	4
1. Borrowed from whom				
2. Purpose of borrowing (crops and items)				
3. Date of borrowing				

1 2 3 5

4. Amount borrowed
 (a) in cash
 (b) in kind
5. Amount actually received
 (a) in cash
 (b) in kind
6. Rate of interest
7. Utilization of the amount
 (a) For the payment of the previous crop loan (amount)
 (b) Other items and amounts
8. Repayments :
 Principal
 Interest
 Total
9. Loan outstanding
 Principal
 Interest
 Total

IX. Production and disposal

Name of the crop	Area	Production	Sales				Remarks
			Quantity	Value	To whom		
					1. Society 2. Government 3. Other agency 4. Private sales		
1	2	3	4	5	6	7	

- X.
1. Reasons for non-participation
 2. If participated, experiences about the variety (such as whether the crop had to be abandoned or the use of fertilizers had to be stopped or the crop was a great success etc.)
 3. Notes

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