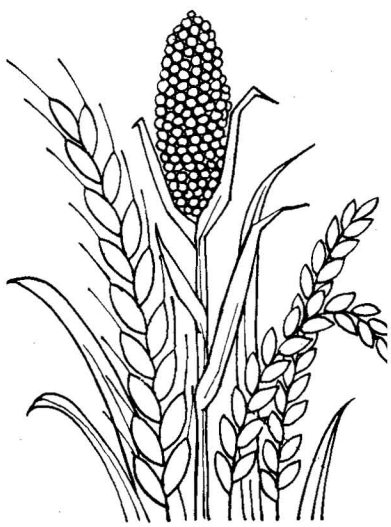
Vol XXVI
No. 4

ISSN 0019-5014

CONFERENC
NIMBER

OCTOBER-
DECEMBER
1971

INDIAN JOURNAL OF AGRICULTURAL ECONOMICS



INDIAN SOCIETY OF
AGRICULTURAL ECONOMICS,
BOMBAY

INSTITUTIONAL CREDIT AND HYV PROGRAMME—AN ANALYSIS OF CREDIT REQUIREMENT AND ECONOMIC FEASIBILITY (A CASE STUDY IN BIRBHUM, WEST BENGAL)*

PRASANTA KUMAR BHANJA

Agro-Economic Research Centre
Visva-Bharati, Santiniketan

The district of Birbhum has been assigned an important place in the HYV Programme taken up by the State of West Bengal. The climate, the soil and the crop pattern followed in the district offer a suitable scope for the introduction of the new programme. The infra-structure created in the district during the Second and Third Plans was also found suitable for the implementation of the programme.

It is now fully established that the implementation of the programme requires the application of some modern inputs like chemical fertilizers, pesticides for which the credit requirement is much higher than that for the cultivation of local varieties of paddy. In order to have the desired increase in production it was imperative that necessary credit should be made available to the farmers who are, in general, financially handicapped.

The objectives of the study are to assess the requirement of credit for the cultivation of the HYV paddy and to examine the economic feasibility of the programme through an estimation of the additional benefits to cultivators arising out of the HYV paddy in different size-groups of farms.

Data for the study have been drawn from the "Study of High-Yielding Varieties Programme in the District of Birbhum"[1] conducted by the Agro-Economic Research Centre, Visva-Bharati in 1968-69.

For the collection of data four 'good' villages were selected purposively in two blocks on the basis of past performances in respect of the cultivation of the HYV paddy and wheat. From these four villages a total of 100 farms—15 participant and 10 non-participant farmers per village—were randomly selected to provide a comparison in the performance for the two categories of farmers. The participant farmers are those who have grown the new variety even in a very small area while the non-participant farmers are those who do not grow any improved variety.

---

* The author is grateful to Shri B. K. Chowdhury, Assistant Director, Agro-Economic Research Centre, Visva-Bharati for his valuable suggestions.

1. A Study of High-Yielding Varieties Programme in the District of Birbhum, West Bengal with Reference to *Kharif* Paddy, 1968-69, M. G. Ghosh, Agro-Economic Research Centre, Visva-Bharati 1969 (mimeo.).

Distribution of the Selected Farms by Size-Groups

The distribution of the selected farms by size-groups as given in Table I shows that of the participant farms about 75 per cent were concentrated

TABLE I—DISTRIBUTION OF FARMS BY SIZE-GROUPS

Size-groups (acres)	Participant farms			Non-participant farms		
	No. of holdings		Total operated area (acres)	No. of holdings		Total operated area (acres)
	Number	Per cent		Number	Per cent	
0·01 — 2·50 ..	7	11·67	13·49	12	30·00	17·69
2·51 — 5·00 ..	23	38·33	89·89	20	50·00	78·02
5·01 — 7·50 ..	10	16·67	58·90	5	12·50	30·99
7·51 — 10·00 ..	5	8·33	45·25	2	5·00	18·33
10·01 — 15·00 ..	4	6·67	50·33	1	2·50	13·00
15·01 — 20·00 ..	3	5·00	54·33	—	—	—
20·01 — 25·00 ..	5	8·33	125·00	—	—	—
Above 25 ..	3	5·00	100·00	—	—	—
Total ..	60	100·00	537·19	40	100·00	158·03

in the lower (upto 5 acres) and the lower middle groups (5—10 acres) while about 98 per cent of the non-participant farms were concentrated in these two groups. Since all the big farms having land above 15 acres participated in the programme no non-participant farm from that category could be included in the sample. This was a sufficient proof that the programme had been able to enthuse the big farmers in such a way that they took up the cultivation of the HYV paddy though the extent of participation differed considerably as will be evident from Table II.

TABLE II—AREA UNDER HYV AND ORDINARY VARIETIES OF PADDY

Size-groups (acres)	Participant farms				Non-participant farms	
	Area under ordinary paddy		Area under HYV paddy		Area under ordinary paddy	
	Area (acres)	Percentage of cultivated area	Area	Percentage of cultivated area	Area (acres)	Percentage of cultivated area
0·01 — 2·50 ..	9·40	69·68	3·83	28·39	17·04	96·33
2·51 — 5·00 ..	63·84	71·02	22·19	24·68	73·94	94·77
5·01 — 7·50 ..	42·22	71·68	13·90	23·60	28·67	92·51
7·51 — 10·00 ..	35·72	78·93	8·26	18·25	17·50	95·47
10·01 — 15·00 ..	41·71	82·87	7·83	15·56	12·20	93·85
15·01 — 20·00 ..	48·80	89·82	2·33	4·29	—	—
20·01 — 25·00 ..	80·00	64·00	35·50	28·40	—	—
Above 25 ..	42·00	42·00	50·00	50·00	—	—
Total ..	363·69	67·70	143·84	26·78	149·35	94·51

Area under HYV Paddy

Paddy was the most important *kharif* crop in the selected farms which occupied 94 per cent of the total cultivated area in both the participant and non-participant farms. The other crops which accounted for very little area were sugarcane, ginger and arum. It can be seen from Table II that the area under the HYV paddy occupied only 27 per cent of the total cultivated area. The proportion of cultivated area devoted to the HYV paddy was smaller in the middle size-groups of holdings as compared to the lower and the higher size-groups of farms. The highest percentage of area (50) put to the HYV was found in the highest size-group while the lowest proportion (4.29) was found in the size-group of 15.01—20.00 acres.

Current Cash Expenditure per Acre

In arriving at the expenditure per acre we have taken into account only the current cash expenses for the cultivation of the HYV and ordinary paddy in order to avoid the difficulties in the evaluation and imputation of farm furnished resources like seed, manure, family labour, bullock labour, etc. The current cash expenditure per acre of the HYV and ordinary varieties of paddy for the *kharif* season is shown in Table III.

TABLE III—AVERAGE CASH EXPENDITURE PER ACRE

Size-groups (acres)	Ordinary varieties of paddy (Rs.)	HYV paddy (Rs.)	Additional cash expenditure in HYV paddy (Rs.)	Percentage increase in cash expenditure (col. (3) over col. (2)
(1)	(2)	(3)	(4)	(5)
0·01 — 2·50	35·13	216·69	181·56	516·82
2·51 — 5·00	52·16	265·24	213·08	408·51
5·01 — 7·50	54·59	259·17	204·58	374·76
7·51 — 10·00	51·69	315·07	263·38	509·54
10·01 — 15·00	74·73	374·12	299·39	400·63
15·01 — 20·00	—	381·27	—	—
20·01 — 25·00	—	464·24	—	—
Above 25	—	461·82	—	—
Average	51·55	390·81	339·26	658·12

It can be seen that the average cash expenditure per acre of the HYV paddy was Rs. 391 as against only Rs. 52 for the ordinary variety despite the fact that the farmers did not adhere to the recommended doses of inputs, particularly in respect of chemical fertilizers and pesticides. However, even

at the prevailing scale of different inputs and farm practices, a switch over from the local varieties to the HYV paddy needs an additional cash expenditure to the extent of Rs. 339 per acre. The cash expenditure, however, varies widely in different size-groups of holdings. Farms in the lowest size-group appear to have incurred the lowest amount of expenditure per acre both in the case of local varieties and HYV paddy while the highest amount of expenditure was incurred by the farms operating 20.01 to 25.00 acres of land. Larger cash expenditure for hired labour is the main contributing factor towards the higher cash expenditure in the largest size-groups of farms.

Credit Requirement and Institutional Credit

In the present stage of technology an additional cash expenditure of Rs. 339 per acre is required, on an average, in the process of switch over from ordinary to the HYV paddy cultivation. As compared to this requirement, a provision of Rs. 150 per acre has been made subject to a maximum limit of Rs. 900 per individual cultivator. Since the co-operative societies did not play any effective role in providing the needed credit the distribution of loan was done exclusively by the Block Offices. The quality of credit was least affected as the terms and conditions of supply by the Government seemed to be more favourable than those under the co-operative societies. However, the amount of permissible loan appeared to be extremely inadequate for the purpose. This not only led to lower doses of inputs for the financially weak farms but also discouraged participation of small farmers in the programme in a massive way.

The importance of the sources of loans is shown in Table IV. On an average, only one-third of the total current cash expenditure was met by Government loans and the rest was financed by the cultivators themselves. There was no other source of finance. The proportion of cash expenditure met by the Government varied between 8 per cent in the highest size-group and 147 per cent in the lowest size-group. Farmers operating 15.01 to 20 acres of land met the entire cash expenditure from their own funds. Over supply of credit (147 per cent) to the lowest size-group of farms was due to the fact that some farmers were able to circumvent the provision of advancing credit of Rs. 150 per acre for the cultivation of the HYV paddy by declaring in the loan application a larger area under the HYV paddy than what is intended and actually cultivated. The weaker section of the farmers cannot take up cultivation of the HYV crop unless they are provided with the needed credit. In order to meet their credit requirements they have resorted to the dubious step referred to above. Although the cash expenditure for the HYV paddy is higher in the larger farms than that in the smaller ones, the former being financially stronger required a smaller amount of loans.

Gross Output per Acre

In the assessment of benefits from the cultivation of the HYV paddy an estimate of the increase in the gross output per acre appeared to be the most

TABLE IV—DISTRIBUTION OF FINANCE PER ACRE OF HYV AND ORDINARY VARIETIES OF PADDY BY SOURCE

Size-groups (acres)	HYV paddy (Participant farms)					Ordinary varieties of paddy (Non-participant farms)				
	Total cash expenditure per acre (Rs.)	Amount borrowed per acre from Government (Rs.)	Percentage of cash expenditure met by Government	Percentage of cash expenditure self-financed	Percentage of farms borrowed from Government	Total cash expenditure per acre (Rs.)	Amount borrowed per acre from Government (Rs.)	Percentage of cash expenditure met by Government	Percentage of cash expenditure self-financed	Percentage of farms borrowed from Government
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
0·01 — 2·50	216·69	318·53	147·0	—	85·7	35·13	11·74	33·4	66·6	8·3
2·51 — 5·00	265·24	238·67	90·0	10·0	95·7	52·16	23·20	44·5	55·5	45·0
5·01 — 7·50	259·17	277·70	107·2	—	100·0	54·59	13·95	24·2	75·8	40·0
7·51 — 10·00	315·07	230·86	73·0	27·0	100·0	51·69	—	—	100·0	—
10·01 — 15·00	374·12	107·28	28·7	71·3	75·0	74·34	—	—	100·0	—
15·01 — 20·00	381·27	—	—	100·0	—	—	—	—	—	—
20·01 — 25·00	464·24	112·39	24·2	75·8	80·0	—	—	—	—	—
Above 25	461·82	36·00	7·8	92·2	33·3	—	—	—	—	—
Average	390·81	131·44	33·6	66·4	85·0	51·55	15·06	28·4	71·6	30·0

crusial factor. The gross output and its value per acre of the HYV and ordinary varieties of paddy are shown in Table V.

TABLE V—AVERAGE GROSS OUTPUT PER ACRE

Size-groups (acres)	HYV paddy		Ordinary paddy		Increase in value of gross output per acre (Rs.) col. (3) minus col. (5)	Percentage increase in value of gross output col. (3) over col. (5)
	Gross output per acre (maunds)	Value of output per acre (Rs.)	Gross output per acre (maunds)	Value of output per acre (Rs.)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
0·01 — 2·50 ..	42·04	1,008·96	22·61	542·64	466·32	85·94
2·51 — 5·00 ..	46·28	1,110·72	22·61	542·64	568·08	104·69
5·01 — 7·50 ..	37·99	911·76	21·97	527·28	384·48	72·92
7·51 — 10·00 ..	47·46	1,139·04	22·85	548·40	590·64	107·70
10·01 — 15·00 ..	49·94	1,198·56	22·95	550·80	647·76	117·60
15·01 — 20·00 ..	39·91	957·84	—	—	—	—
20·01 — 25·00 ..	49·83	1,195·92	—	—	—	—
Above 25 ..	47·30	1,135·20	—	—	—	—
Average ..	47·78	1,122·72	22·55	541·20	581·52	107·45

The average gross output per acre of the HYV paddy is 47 maunds as compared to 23 maunds for the local variety. The yield for the former, even at the present level of technology, was found to be a little more than double the yield obtained from the latter. In value terms, the HYV yielded Rs. 1,123 per acre as compared to Rs. 541 for ordinary variety showing a net increase of Rs. 581 per acre on an average. The extent of increase, however, differed considerably among the different size-groups. Farm size did not appear to have any influence on either the gross output per acre or the extent of increase in the value of gross output. It is interesting to point out that while the range of variation in output was very narrow from 21.97 to 22.95 maunds for ordinary paddy, the range was sufficiently wide from 37.99 to 49.83 maunds in the case of the HYV paddy. Such wide variation might be the effect of different levels of inputs applied to the crops.

Increase in Farm Income per Acre

From the point of view of an assessment of the benefits as well as the economic feasibility of the programme what is really relevant is the increase in farm income per acre due to the introduction of the new variety. Farm income is defined here as the value of gross output less the current cash expenditures of cultivation. Farm income thus calculated would decline to

some extent if the items of costs such as family labour, bullock labour, farm-yard manure, etc., were also taken into account. Data relating to farm income per acre in respect of both the ordinary and the HYV paddy have been presented in Table VI.

TABLE VI—INCREASE IN FARM INCOME PER ACRE

Size-groups (acres)	Ordinary varieties of paddy (Rs.)	HYV paddy (Rs.)	Additional farm income per acre from HYV paddy (Rs.)	Percentage increase in farm income from HYV paddy
(1)	(2)	(3)	(4)	(5)
0·01 — 2·50	507·51	792·27	284·76	56·11
2·51 — 5·00	490·48	845·48	355·00	72·38
5·01 — 7·50	472·69	652·59	179·90	38·06
7·51 — 10·00	496·71	823·97	327·26	65·88
10·01 — 15·00	476·07	824·44	348·37	73·18
15·01 — 20·00	—	576·57	—	—
20·01 — 25·00	—	731·68	—	—
Above 25	—	673·38	—	—
Average	489·65	731·91	242·26	49·48

The income per acre of the HYV and ordinary paddy being Rs. 731 and Rs. 490 respectively there was a net surplus of Rs. 242 per acre after meeting the out of pocket expenditure for the new varieties of paddy. A switch over from the ordinary to the HYV paddy would, in general, result in a gain of Rs. 242 per acre though the extent of the gain was likely to fluctuate widely from Rs. 180 to Rs. 348. Farm size did not appear to have any effect on the income raised from either of the crops.

Conclusion

The crucial question was whether Rs. 242 per acre formed a sufficient incentive to the big and small farmers to abandon their traditional crop and to switch over to the new varieties. In view of the fact that the big farmers were financially strong and thus in a better position to bear the risk involved in the cultivation of the HYV crop the switch over to the new variety might be quite feasible for them but the small farmers who live near the borderline of the subsistence level can hardly feel enthusiastic over the new variety which requires a large outlay of cash. Besides, the risk involved in the change over was too great for them. Large cash requirement and the high risks were the two main factors which impeded large scale adoption of the new varieties by the small farmers. In order to popularise the new varieties of paddy the

small and marginal farmers needed sufficient institutional credit. A more realistic approach should, therefore, be taken by the Government so as to meet the total requirements of cash. The existing co-operative societies may be rejuvenated and reoriented to finance the HYV Programme if possible in addition to the Government agency. This will not only induce a higher level of participation particularly amongst the mass of small farmers but also help application of the recommended doses of inputs so that they will be able to reap the full benefits of the Programme.

GREEN REVOLUTION AND SHORT-TERM CO-OPERATIVE CREDIT—A STUDY IN TWO DISTRICTS OF MADHYA PRADESH

M. C. ATHAVALE, K. S. YADAV AND J. P. MISHRA*

Agro-Economic Research Centre for Madhya Pradesh
Jabalpur-4

Introduction

The High-Yielding Varieties Programme (HYVP) is in operation in Madhya Pradesh since *kharif*, 1966. Of the various crops included, paddy and wheat have been important as they occupied more than 60 per cent of the area under the HYV Programme. For the present investigation, Raipur (for paddy) and Tikamgarh (for wheat) districts were selected.

Objectives and Sample

This paper attempts to assess the role of short-term co-operative credit in providing the services required in the context of the HYV Programme both at the district and farmers' level. To assess the role at the farmer's level 60 farmers growing high-yielding varieties were selected from each of the two districts. The year of reference was 1968-69.

Organization and Operation

The organizational set-up of the co-operative department was similar in both the districts except that in Raipur, the Deputy Registrar was the head of the department whereas in Tikamgarh district, it was the Assistant Registrar. In each block there was a Co-operative Extension Officer and he was helped by a number of *Samiti Sevaks* working at the village level.

* The authors are grateful to Dr. V.P. Shukla, Director, Agro-Economic Research Centre, Jabalpur, for his guidance and permission to use the official data in this paper.