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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

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Introduction

The High-Yielding Varieties Programme (HYVP) is in operation in Madhya Pradesh since *khariif*, 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.

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The organizational set-up of the District Co-operative Central Banks was such that each block had at least one branch and for every branch, there was a branch manager and a number of Group Officers working under him.

The procedure followed in financing was that the credit permits were prepared by *Samiti Sevaks* on the basis of farm plans and were submitted in the branch of the bank. The loan account of the society was debited to the extent of the value of the permits. Of the various components for which credit was sanctioned, seed was supplied by the Agriculture Department, fertilizers and pesticides by the Co-operative Department and cash requirement was met by the Co-operative Bank. Financing was made according to the scales of finance (Table I).

TABLE I—SCALES OF FINANCE, HYVP, RAIPUR AND TIKAMGARH DISTRICTS
(Rupees per hectare)

Input	Raipur		Tikamgarh
	I.R.8 and T.N.1	Other HY varieties	Mexican wheat
Seed	30	30	124
Fertilizers	469	283	479
Pesticides	74	62	27
Cash	198	198	198
Total	771	573	828

In Raipur district, against the calculated requirement of loan of Rs. 2,62,72,000, the amount disbursed was Rs. 16,43,790 or 6.26 per cent. The percentage of amount disbursed for different components varied much. It was 8.60 per cent in the case of fertilizers, 4.35 per cent for cash and 3.28 per cent for seed. In Tikamgarh district, the calculated requirement amounted to Rs. 83,50,000. Against this, the amount disbursed was Rs. 45,47,000 or 54.46 per cent. The percentage of disbursement for seed was 46 and that for fertilizers, 78.85. In the case of pesticides, the percentage was 14.91 (Table II).

TABLE II—CALCULATED REQUIREMENT AND ACTUAL DISBURSEMENT OF CO-OPERATIVE CREDIT, HYVP, RAIPUR AND TIKAMGARH DISTRICTS
(in Rs.)

	Raipur			Tikamgarh		
	Calculated requirement	Amount disbursed	Percentage requirement	Calculated requirement	Amount disbursed	Percent- age
Seed	11,52,000	37,773	3.28	12,50,000	5,75,000	46.00
Fertilizers	1,47,90,000	12,71,966	8.60	48,50,000	38,24,000	78.85
Pesticides	26,50,000	71	Negl.	2,75,000	41,000	14.91
Cash	76,80,000	3,33,980	4.35	20,00,000	1,07,000	5.35
Total	2,62,72,000	16,43,790	6.26	83,50,000	45,47,000	54.46

Co-operative Credit on Selected Farms

In order to assess the role of short-term co-operative credit in the HYVP at the farmers' level, its share in the total current farm expenditure was calculated. Current farm expenditure includes following cash and kind items.

Items of cash expenditure

1. Seed, manure, fertilizers, and pesticides : purchased, borrowed and obtained on co-operative credit or *taccavi* loan.
2. Irrigation charges.
3. Wages of hired human labour including that of the permanent farm servant.
4. Payment for hired bullock labour including the value of fodder purchased to feed owned draught animals.
5. Rent paid for leased-in land.
6. Land revenue.

Items of kind expenditure

1. Value of seed : farm produced, exchanged or earned in kind wages.
2. Value of farm produced manure.
3. Kind wages of labour including permanent farm servant.
4. Rent paid in kind.

The current farm expenditure per hectare on the selected farms of Raipur district was Rs. 463.74 and that of Tikamgarh district Rs. 478.53. The break-up of the current farm expenditure into different items is presented in Table III.

TABLE III—BREAK-UP OF CURRENT FARM EXPENDITURE PER HECTARE HYVP, RAIPUR AND TIKAMGARH DISTRICTS

(in Rs.)

Items of input	Raipur district		Tikamgarh district	
	Value	Percentage	Value	Percentage
Seed	69.37	14.96	115.30	24.09
Manure	58.72	12.66	39.02	8.15
Fertilizers	129.34	27.89	236.04	49.34
Pesticides	1.72	0.37	0.53	0.11
Irrigation	12.62	2.72	33.51	7.00
Hired human labour	182.17	39.29	41.15	8.60
Hired bullock labour	3.95	0.85	0.16	0.03
Rent	2.68	0.58	9.63	2.01
Land revenue	3.17	0.68	3.19	0.67
Total	463.74	100.00	478.53	100.00

On the farms of Raipur district, hired human labour was the most important item, followed by fertilizers, seed and manure in that order of importance. On the farms of Tikamgarh district, on the other hand, fertilizers was the most important item. The other items were seed, hired human labour and manure.

The sources of finance on the selected farms were own funds, co-operative credit and local borrowings. The percentage contribution of different sources varied in the two districts. In Raipur district 65.25 per cent of the expenditure was met out of own fund and 30.22 per cent out of co-operative loans. In Tikamgarh district, the most important source was co-operative credit which constituted 59.51 per cent of the total expenditure. Own funds accounted for 39.21 per cent of the expenditure (Table IV).

As regards sources of finance for different inputs, it was observed that in both the districts, the entire expenditure on manure, rent and land revenue was met out of own funds. In Tikamgarh district, expenditure on irrigation, hired human labour and hired bullock labour was also incurred entirely from own funds. In Raipur, 98 per cent of the expenditure on irrigation, 89 per cent of that on hired human labour and 94 per cent on hired bullock labour were met out of own funds. The items for which co-operative credit was mainly used were, seed, fertilizers and pesticides. In both the districts, the entire quantity of pesticides used was obtained through co-operative credit. For fertilizers, the farmers of Raipur district depended entirely on co-operative credit but the farmers of Tikamgarh district obtained a part of it from own funds and local borrowings. Further, in Raipur district 86 per cent of the amount spent on seed was paid out of own funds and 12 per cent out of co-operative credit. In Tikamgarh district, on the other hand, co-operative credit financed nearly half of the needs of HYV seed and the rest was met out of own funds (Table IV).

Conclusion

The contribution of co-operative credit in the HYV Programme varied considerably in the selected two districts. While the proportion of loan disbursed to calculated requirement was only 6.26 per cent in Raipur district, it was 54.46 per cent in Tikamgarh district. The main reason of the small percentage of the credit supply in Raipur district was the existence of a large number of defaulter farmers. The proportion of co-operative credit varied from input to input.

On the selected farms, co-operative credit contributed 30.22 per cent of the current farm expenditure in Raipur district and 59.51 per cent in Tikamgarh district. In both the districts, co-operative credit was used mainly for seed, fertilizers and pesticides. For other inputs farmers used their own funds.