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LESSONS FROM THE PACKAGE PROGRAMME WITH IMPLICATIONS FOR THE NEW AGRICULTURAL STRATEGY

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INTRODUCTION

The Intensive Agricultural District Programme or Package Programme has been operating in India since 1960-61 and does not require an elaborate introduction.¹ It arose out of the report² of the Agricultural Production Team sponsored by the Ford Foundation to study India's food production problems. The Team recommended a programme to promote intensification of agricultural production in certain areas where conditions favoured a quick response to short term development efforts. The aim of the programme was to show that production could be expanded quickly if a whole set of inputs including improved seeds, fertilizers, pesticides and irrigation water, was made available to cultivators in one complete batch or package. A package of services was to be provided simultaneously including co-operative credit, marketing facilities and special extension efforts in the form of a high-powered demonstration programme and extensive farm planning. The programme was introduced on a pilot basis in seven districts³ in 1960-61 and was extended to nine more districts in 1962-63.

The purpose of this paper is to evaluate the success of the programme so far in the first seven districts; to define the problems which are limiting progress; to make recommendations regarding the elimination of these problems, and to derive implications from experience in the package programme areas which will be relevant for the successful implementation of the new agricultural strategy.⁴

1. For detailed discussion on the genesis and framework of the programme, see Intensive Agricultural District Programme Report (1961-63), Expert Committee on Assessment and Evaluation, Ministry of Food and Agriculture (Department of Agriculture), Government of India, 1963; also, Narindar S. Randhawa, "Farm Planning Project under Intensive Agricultural District Programme in India," *Indian Journal of Agricultural Economics*, Vol. XX, No. 3, July-September, 1965.

2. Report on India's Food Crisis and Steps to Meet It, Agricultural Production Team, sponsored by the Ford Foundation, Ministry of Food and Agriculture, Government of India, April, 1959.

3. Aligarh (Uttar Pradesh), Ludhiana (Punjab), Pali (Rajasthan), Raipur (Madhya Pradesh), Shahabad (Bihar), Thanjavur (Madras) and West Godavari (Andhra Pradesh).

4. See, Reorientation of Programmes of Agricultural Production, Ministry of Food and Agriculture, Department of Agriculture, Government of India, November, 1965.

ASSESSMENT OF PERFORMANCE

Selection of responsive areas, assurance of material inputs to meet the development needs of these areas and stepped up extension efforts should have led to a markedly higher rate of growth within these areas compared to other less favoured regions. It seems reasonable, therefore, to compare progress in the package districts with progress in the immediately adjoining districts in each case, in order to arrive at a first measure of the success of the programme.

In the early years of operation of the programme, certain problems were encountered which hampered progress and in any case, it could not be expected to move into top gear straightway. By 1962-63, only about 20 per cent of the gross cropped area in the package districts had been covered by the programme. In the years immediately following, however, it was hoped that an appreciable impact would be made on total production in these districts. Accordingly, in Table I, a comparison is made between the package districts and their respective adjoining districts in terms of the average annual increase in output of important foodgrains in 1963-65 compared to the pre-package three years' average.

TABLE I—PERCENTAGE INCREASE IN AVERAGE ANNUAL PRODUCTION OF IMPORTANT FOOD-GRAINS IN THE PERIOD 1963-64—1964-65, COMPARED TO PRE-PACKAGE* LEVEL IN IADP DISTRICTS AND ADJOINING DISTRICTS

Part I		Wheat	Barley	Maize	Jowar	Bajra		
Aligarh	.. ..	40.2	5.5	91.7	—	18.9	
Adjoining district	.. ..	—9.8	—25.7	14.8	—	7.7	
Ludhiana†	.. ..	85.6	—	17.5	—	—	
Adjoining district	.. ..	18.5	—	28.2	—	—	
Pali	.. ..	—23.2	—18.7	—	—59.2	—2.8	
Adjoining district	.. ..	1.3	—28.1	—	—37.3	8.1	
Shahabad	.. ..	4.3	—	—	—	—	
Adjoining district	.. ..	19.9	—	—	—	—	
<hr/>								
Part II |	Raipur	Adjoining district	Shahabad	Adjoining district	Thanjavur	Adjoining district	West Godavari	Adjoining district
Rice	12.6	—3.2	17.7	59.5	7.9	32.0	23.6	15.1

Source : Derived from the relevant Season and Crop Reports for the pre-package period and from Partially Revised and Final Estimates for the period 1963-65.

*Average of 1957-58 to 1959-60 for Shahabad, Thanjavur and West Godavari. Average of 1958-59 to 1960-61 for Aligarh, Ludhiana, Pali and Raipur.

†For present purposes of comparison the data relating to Doraha Block, which became part of Ludhiana district only in 1963 has been retained in the data for adjoining districts.

Taking a broad view of the data summarized in Table I, three districts appear to be performing at a much lower level than should have been expected in view of the terms in which the programme was framed. These are Pali, Shahabad and Thanjavur. The other four districts are clearly ahead of their respective adjoining districts. In terms of cash crops, performance of the package areas is comparatively worse than for foodgrains.⁵ The overall performance of the programme therefore would appear to be below its potential. Insufficient information is at hand to allow explanations to be offered on an individual district basis for the results shown in the table. A number of interacting natural and organizational factors would have to be analysed and a careful study made at each district level in order to arrive at an explanation. A study of the extent of adoption of certain vital input factors, however, provides some indication of the reasons for the shortfall between achievement and potential.

ADOPTION OF IMPROVED SEEDS, FERTILIZERS AND PLANT PROTECTION

Improved Seeds

Crop cutting surveys carried out as part of the assessment and evaluation programme of IADP⁶ indicate that while in Ludhiana 95 per cent of the wheat crop is grown from improved seeds, other districts are at lesser and varying stages of coverage. In some cases, little progress has been made. The wheat coverage in Aligarh, Shahabad and Pali in 1964-65 was 63 per cent, 26 per cent and 19 per cent respectively. For paddy, in West Godavari, Thanjavur, Shahabad and Raipur, improved seeds were sown over 60 per cent, 52 per cent 21 per cent and 10 per cent of the paddy acreage respectively. Reports from most districts emphasize the superiority of improved seeds over local varieties, but not all of the improved seed is of high quality.

Fertilizers

Table II shows the average rates of application of artificial fertilizers in 1963-64 in the package districts and their respective control blocks, and also recommended rates, for three principal foodgrains crops.

The data on actual rates in Table II are expressed in terms of the total area under each crop. On this basis, it is evident that considerable scope exists for stepping up the use of fertilizer in the package districts. In most cases, in 1963-64, there was a wide gap between actual and recommended rates of usage and a much smaller gap between rates in vogue in the package districts and rates in the control blocks. Three of the districts mentioned in the table, Thanjavur, West Godavari and Ludhiana, were fairly well advanced in terms of fertilizer use, although in each case, rates in their respective control blocks were also high, compared to other control blocks. These three districts were well ahead of the other package districts in terms of percentage of gross cropped area irrigated (see Table III). Ludhiana appears to be the best district—on wheat, the rate of fertilizer usage is highest of all the crops in the table relative to the recommended rate, and also per acre usage is considerably higher in Ludhiana than in its control blocks.

5. C. A. Robertson, G. R. Saini and R. K. Sharma, "The Package Programme—An Appraisal," *Economic and Political Weekly*, Vol. I, Nos. 2 and 3, August 27 and September 3, 1966.

6. Results of Crop Cutting Surveys (1961-65), Institute of Agricultural Research Statistics (I.C.A.R.). (Unpublished.)

TABLE II—AVERAGE RATES OF FERTILIZER APPLICATION IN 1963-64 IN PACKAGE DISTRICTS AND CONTROL BLOCKS, AND RECOMMENDED RATES (TOTAL IN QUINTAL PER HECTARE OF AMMONIUM SULPHATE, SINGLE SUPERPHOSPHATE, POTASSIC FERTILIZERS AND MIXED FERTILIZERS)

				Paddy			
				Raipur	Shahabad	Thanjavur	West Godavari
In package district	..	..	..	0.30	0.47	1.24	1.21
In control blocks	..	..	..	0.03	0.29	0.93	1.04
Recommended rates	..	..	..	2.50	4.80	3.36	3.34
				Wheat			
				Aligarh	Ludhiana	Pali	Shahabad
In package district	..	..	..	0.26	1.63	0.02	0.53
In control blocks	..	..	..	0.12	0.76	0.01	0.12
Recommended rates	..	..	..	1.84	3.70	4.48	4.24
				Maize			
				Aligarh	Ludhiana	Pali	
In package district	..	..	..	0.18	1.11	0.07	
In control blocks	..	..	..	0.19	0.40	0.03	
Recommended rates	..	..	..	4.60	4.94	4.48	

Source : Average rates for package districts and control blocks were calculated from the results of Agro-Economic Surveys (1961-64), Institute of Agricultural Research Statistics (I.C.A.R.) (Unpublished.)

Recommended rates were calculated from recommendations for use of Ammonium Sulphate and Superphosphate in "Crop Responses to Fertilizer Use in I.A.D.P. Districts," Ambika Singh and S. K. Sharma, *Fertiliser News*, December, 1965.

Plant Protection

The use of plant protection measures is much more limited than the use of improved seeds and fertilizer. In 1964-65, 15 per cent of the fields in Thanjavur covered by the crop cutting surveys had received plant protection. In West Godavari, about half of the cultivators received plant protection materials in 1963-64. In the other five districts, however, fewer than 5 per cent of fields were covered (or fewer than 5 per cent of cultivators used these measures). While the need for plant protection measures varies from year to year and from crop to crop, depending upon the incidence or expected incidence of disease, the coverage at present appears to be rather low. Since intensive agriculture tends to be associated with higher incidence of plant diseases, less than optimum level of utilization of protection measures is likely to mean considerable loss of potential output.

In summary, for improved seeds, fertilizers and plant protection materials, while the IAD Programme may be more intensive than elsewhere, it is by no means intensive enough. An explanation for this is now attempted through an analysis of certain critical factors impinging on agricultural development, namely, irrigation, credit and extension.

CRITICAL FACTORS IN INTENSIVE AGRICULTURAL DEVELOPMENT

Irrigation

Despite the definition of maximum irrigation facilities and minimum of natural hazards as two of the basic criteria for choice of the package districts, some of the chosen districts were poorly off for irrigation at the outset. As shown in Table III, the average portion of gross cropped area which was irrigated in the three years before the start of the programme was below 50 per cent in four of the seven districts. Pali and Raipur were particularly poorly placed. These districts consequently are more exposed to the hazards of the monsoons.

TABLE III—EXTENT OF AREA UNDER IRRIGATION AND CHANGES IN AREA IN IADP DISTRICTS

Districts	Gross area irrigated as per cent of gross cropped area		Increase in gross area irrigated as per cent of pre-programme gross cropped area
	Before Programme *	1963-64**	
Aligarh	43.4	50.2	5.3
Ludhiana†	57.5	62.7	9.5
Pali	23.3	22.1	0.7
Raipur	12.0	14.4	2.5
Shahabad	44.5	46.9	6.8
Thanjavur	80.3	79.5	3.0
West Godavari	75.1	76.2	6.2

Source : Season and Crop Reports and unpublished State Agricultural Statistics.

* Average of 1957-58 to 1959-60 for Shahabad, Thanjavur and West Godavari. Average of 1958-59 to 1960-61 for Aligarh, Ludhiana, Pali and Raipur.

** 1962-63 for Aligarh and Pali.

† For present purposes of comparison the data relating to Doraha Block, which became part of Ludhiana district only in 1963 has been retained in the data for adjoining districts.

Substantial advance in extending the irrigable area in mainly rain-fed districts in the early years of the programme could have helped to offset this deficiency. According to the data in Table III, col. 3, however, little progress has been made in this direction, except in the Ludhiana district. Given the dependence of fertilizer use on assured rainfall or reliable irrigation resources, lack of progress in extending the irrigated area has been a major obstacle to intensification. While a certain amount of progress is possible initially even in the poorly irrigated districts by concentrating on those portions which are well-watered by natural or artificial

means, in the long term the programme is bound to be compromised as irrigated area puts a ceiling on the rate and extent of increase in output.

Credit

Realizing that most cultivators would not be able to meet the expenditure required for the adoption of the package of inputs, provision of credit was made an integral part of the programme. It was envisaged that (i) the credit co-operatives would be the main agency for channelling credit, (ii) credit supplied to the cultivators would be production-oriented, based on farm production plans to be prepared for each farmer every year.

The available data on co-operative credit presented in Table IV show that during the period 1961-62 to 1964-65 in most districts, credit co-operatives, the main credit agency, put up a poor performance.

TABLE IV—PROGRESS OF CO-OPERATIVE LOANS AND OVERDUES IN IADP DISTRICTS
1959-60 TO 1964-65

Districts	Percentage of agricultural families covered		Loans advanced (Rs. in lakhs)					Overdues as per cent of outstandings					
	A	1964-65	A	1961-62	1962-63	1963-64	1964-65	A	1961-62	1962-63	1963-64	1964-65	
1. Aligarh	..	50	57	131	141	112	116	156	7	28	34	33	27
2. Ludhiana†	..	51	100	126	174	181	225	258	15	12	27	16	13
3. Pali	..	42	47	31	30	18	4	19	8	8	43	73	83
4. Raipur	..	29	53	191	200	146	172	146	7	6	37	30	46
5. Shahabad	..	35	43	12	33	58	49	69	17	N.A.	N.A.	12	9
6. W. Godavari		51	68	313	332	326	240	191	15	19	24	25	21
7. Thanjavur	..	100	100	214	281	382	426	334	5	N.A.	20	28	37

Source : Ministry of Food, Agriculture, Community Development and Co-operation, Government of India, unpublished.

A = Year preceding the introduction of the programme.

N.A. = Not available.

† = Excluding Doraha Block, which was merged in the Ludhiana district in 1963.

Moreover, as will be shown later, it has not been possible to make co-operative credit production-oriented to the extent envisaged in the programme. The low coverage of co-operatives, the decline in loaning and the existence of heavy overdues in most districts would suggest that the co-operatives failed to meet the needs of the programme. In districts with heavy overdues, credit has become a bottleneck in the growth of the programme. The reduction in the amount of *taccavi* loans in most districts, despite low coverage of the co-operatives, further aggravated the problem of credit.

The failure of the co-operatives to cover the entire agricultural population can be explained by the following reasons. Firstly, most of the co-operatives are not viable enough to maintain the full-time staff necessary for efficient distribution of credit. Secondly, some features of co-operative credit, introduced after the start of the programme, stood in the way of growth of co-operative membership. These are: insistence on lifting a certain arbitrarily fixed proportion of loans in the form of fertilizers; compulsory linkage of credit with marketing, even where marketing co-operatives were failing to provide satisfactory marketing services; and the failure of the co-operatives to provide credit to tenant-cultivators because of the insistence on the farm plan. (Farm plans were not prepared for tenants for want of proper tenancy records.)

The decline in loaning also is partly explained by these restrictive features. Cultivators who could not or did not want to use fertilizers were denied credit facilities. Compulsory linkage of credit with marketing also scared away some cultivators. In some cases, delays in the preparation of farm plans led to denial of credit to cultivators.

The main reason for the decline in loaning, however, was the existence of heavy overdues which choked the flow of co-operative credit. The increase in overdues in turn is explained by the following factors: Firstly, there was over-financing of cultivators in respect of short term credit. This was done in several ways. Short term credit was given for meeting expenses on cultivation (including hired labour to all cultivators) at the full recommended rates whether or not a cultivator used all these specified inputs and irrespective of his own resource position. Moreover, a large proportion of the loan was given in cash. In some cases, the maximum credit limits for an individual co-operative loan was raised to an unduly high level. All this caused over-financing, which in turn led to misuse of credit, unjustified financing of big cultivators and overdues. Crop failures further aggravated the problem of overdues specially in Pali. Secondly, the existing co-operative procedures for making recoveries are very cumbersome and time-consuming. The co-operative officials who run the co-operatives do not have enough powers to proceed against the defaulters and the elected officials of the co-operatives usually do not initiate action against defaulters for fear of becoming unpopular among the co-operative members. As a result, defaulters continue to be in default for a number of years.

Extension

Extension activities in the IADP areas centre around (i) farm planning, and (ii) composite crop demonstrations.

Farm planning, which is considered to be the core of the programme, has so far been limited to the preparation of a simple farm plan for every cultivator participating in the programme. The objective of the simple farm plan has been to introduce the package of inputs to cultivators. Judged by the number of farm plans prepared in 1964-65, farm planning has an impressive record. In that year 6.8 lakh farm plans were prepared in the original seven districts. It has been claimed that the farm plan has "become a powerful instrument for introducing the farmer to improved methods, making him more efficiency-minded and economy

conscious....."⁷ A few independent studies,⁸ conducted in the IADP, however, do not support these claims, and strongly suggest that farm planning has been merely a grandiose exercise on paper. The farm plan to the village level worker is just another piece of paper and the sheer number of plans which he is expected to complete together with the mechanical and non-dynamic way in which this is being done suggests that the farm plan in its present form is largely a waste of time and resources.

Official data on crop demonstrations show that the demonstrations were by and large successful. Less is known about their effectiveness as a method of diffusion of the recommended inputs. A study in Aligarh states: "The investigation indicates that a substantial proportion of cultivators knew little or nothing about the demonstrations which had taken place in their villages. One of the pre-requisites for successful dissemination of the package concept in depth was not, therefore, met."⁹ The reasons for this were stated to be inadequate preparatory groundwork to arouse interest in demonstrations and inadequate follow-up and supervision. Despite these limitations, however, crop demonstrations have been a most useful extension activity in the IADP. Firstly, through these demonstrations a large number of cultivators were shown the feasibility and profitability of the package on the farmers' holdings. Secondly, these demonstrations served as a practical exercise to the extension staff, particularly the village level workers who were forced to prove what they were preaching to the cultivators.

RECOMMENDATIONS FOR THE NEW AGRICULTURAL STRATEGY IN THE LIGHT OF PACKAGE PROGRAMME EXPERIENCE

In 1964 the package programme was extended to 114 districts in the form of the Intensive Agricultural Areas Programme. More recently a High Yielding Varieties Programme,¹⁰ which is the core of a new agricultural strategy, has been put into operation in areas with assured rainfall and irrigation, and it is expected to cover 32 million acres of foodgrains alone by 1970-71. The high yielding varieties programme envisages a super-intensive type of agricultural development, based on package principles, involving high factor inputs on new varieties capable of giving very high yields. The rationale basic to this scheme has already been subject to criticism.¹¹ From a different angle the experience of the package programme calls into question whether the high yielding varieties programme as

7. Intensive Agricultural District Programme, Second Report (1960-65), Expert Committee on Assessment and Evaluation, Ministry of Food and Agriculture, Community Development and Co-operation (Department of Agriculture), Government of India, New Delhi, 1966, p. 522. (Mimeo.)

8. See C.P. Shastri, "Production Plans for Farmers in Shahabad District in Bihar" and G. Parthasarathy and M. Meenakshi Malya, "Farm Plan Approach to Increased Production" in Seminar Series IV—Problems of Farm Production Planning and Programming, Indian Society of Agricultural Economics, Bombay, 1964. See also, K.M. Choudhary: Factors Affecting Acceptance of Improved Agricultural Practices (A Study in an I.A.D.P. District in Rajasthan), Research Study No. 9, Agricultural Economics Research Centre, Sardar Vallabhbhai Vidyapeeth, Vallabh Vidyanagar, 1965. R. K. Sharma: Co-operative Credit in the Package Programme—A Study in Aligarh District, U.P., Intensive Agricultural District Programme Studies, No. 2, Agricultural Economics Research Centre, University of Delhi, 1966.

9. Effectiveness of Crop Demonstrations—A Study of Wheat Demonstrations in Aligarh District, U.P., Agricultural Economics Research Centre, University of Delhi, 1964, p. 34.

10. Re-orientation of Programmes of Agricultural Production, *Op. cit.*

11. B. S. Minhas and T. N. Srinivasan, "New Agricultural Strategy Analysed," *Yojana*, Annual Number, Republic Day, January 26, 1966. V. G. Panse, "A Critical Study of New Food Strategy," *Yojana*, August 21, 1966.

originally framed, or in an improved theoretical form, is realizable. The deficiencies of the former cast doubts upon this. Certain critical aspects of the cultivator's environment need to be strengthened before the new programme can hope to realize its potential.

Irrigation

There is not necessarily coincidence between irrigated areas and areas where irrigation is adequate and reliable enough to meet the needs of the Mexican type of wheat and new strains of paddy. The terms of reference under which the strategic areas are to be chosen are essentially similar to those on which the package programme was based and in many of the package programme areas, irrigation is quite inadequate even for current improved varieties and relatively low rates of fertilizer application. If the criteria laid down for choice of strategic areas have not been strictly adhered to, the high yielding varieties programme will get off to a poor start.

It is generally admitted that available water resources in India are under-utilized, both in terms of the extent of untapped supplies and in terms of the efficiency of utilization of the water which is drawn upon. What is required is a careful analysis of water availability and demand for water, planned exploitation of supplies from various sources and closer control over water utilization. The intensive agricultural districts, which are the spearheads of agricultural development, provide the setting in which such a policy should be undertaken, even if it needs to be based on areas larger than district size. Little, apparently, is being done at present in choosing among irrigation investment alternatives on an economic basis. Certain questions present themselves in this context. Should investment be made to improve the efficiency of operation of canals through, say, reduction in losses from seepage, storage of surplus water, or establishment of a special staff to advise cultivators on water management? What is the pay-off from drainage and from land reclamation? What should be the investment in State tube-wells? What are the relative merits of private tube-wells versus masonry wells? What are the economics of sinking new wells versus repairing old ones? How should expansion of private irrigation be financed? It is suggested that in each intensive district, in the context of a broad objective aimed at covering the district to the maximum extent possible (in view of water availability both ground and surface) within a set number of years, answers to the questions posed above should be sought and implemented. In the absence of requisite data on this subject, it is not possible to supply answers here. Some tentative suggestions are however offered for consideration.

Expansion of the canal system is bound up with very high fixed capital investment and a relatively long gestation period. In view of the limits on the scale of any such expansion, resort to increased tube-wells and/or minor irrigation projects is indicated. While on an economic basis tube-wells are probably preferable to masonry wells, inadequate power resources and operational difficulties reduce their efficiency. This generates uncertainty in the minds of the cultivators and has an adverse effect on their attitudes to adoption of intensive techniques. Unless an immediate improvement in these services can be achieved, policy should be one of limited expansion of tube-well irrigation associated with reliable service.

The other main possibility is development of minor irrigation facilities on the cultivators' holdings. In the first instance, efforts should be directed towards expanding irrigation facilities to the cultivators who do not have any source of irrigation, but who have enough land to make investment in minor irrigation an economic proposition. Once this phase is well under way to completion, expansion should be continued to rain-fed holdings, parts of which are already irrigated, and on to holdings within the command area of canals and State tube-wells, where the water supply is particularly inadequate.

Credit and Supplies

The main inputs to be allocated under the new programme are seeds, fertilizers and pesticides. Two questions arise here. Firstly, will these inputs actually be available in the planned quantities? Secondly, is the distribution system adequate to handle these quantities?

In the past, the improved seed production programme has run into difficulties.¹² In the package programme itself, it has not been possible to achieve anything like complete coverage with improved seeds, even for the major crops. The new strategy envisages a well co-ordinated programme for the production and distribution of seeds of consistently high quality. While there is nothing wrong with this concept, is there sufficient reason to believe that the organization of the seed production programme will be so much more successful than in the package programme areas where intensive development has been followed on a much smaller scale?

Although it is too early to be categorical the signs are that the fertilizer production target of 2 million tonnes of nitrogen by the end of Fourth Plan is over-optimistic. Fertilizer might be imported to make up for any shortfall in production, but the foreign exchange problem arises here. In the IADP districts, shortages of fertilizers are now being felt, so highlighting the allocation problem between intensive areas and other areas. Over the next four years, will allocation be made in such a way as to fulfil planned availability of fertilizers in these specially selected areas?

As far as pesticides are concerned, comparatively little progress has been made in the package areas. On the introduction of improved varieties on a wide scale, associated with more intensive use of water and fertilizers, the need for close control of pests and diseases will assume greater urgency.¹³ It is the intention of the Government to ensure that adequate supplies and adequate means of applying plant protection measures are at hand. However, there are admitted deficiencies in this respect at the present moment.

The experience of the package programme suggests that under the present set-up co-operatives cannot efficiently serve the needs of an intensive development programme. Most co-operatives are not sufficiently viable to shoulder the

12. See, for instance, Report on the Administration of the Improved Seed Saturation Programme in Varanasi District, Development Administration Unit, Committee on Plan Projects, Planning Commission.

13. Reports are current about the incidence of disease on these new varieties in *Kharif*, 1966. See *Economic Times*, August 27, 1966.

heavy responsibilities of disbursing production-oriented credit and the supplies to go with it. Co-operative procedures are cumbersome; in most areas co-operatives do not have adequate coverage. It is impossible to build up a sound co-operative structure over-night. Growth of agriculture on the other hand cannot wait for the growth of co-operatives. Moreover, a semi-autonomous and local political organization like the co-operative cannot easily be made to keep pace with the needs of a fast developing and demanding programme of agricultural development. There is a need, therefore, to have alternative institutional sources of credit. In this connection, the proposal to set up agricultural credit corporations in certain States where the co-operative movement is weak must be quickly and efficiently translated into action if the new agricultural development programme is not to court delay at the outset.

Within the present co-operative framework a bold and vigorous effort is needed to gear up the credit structure to cope with the increasing demand for credit, especially in districts having heavy overdues. In particular revitalization of co-operatives must have top priority along with measures to streamline lending practices.

There is need for more medium term credit, particularly for minor irrigation and drainage. In order to ensure against misuse loans should be given along with supplies of the necessary materials and only to the extent that such materials are actually available.

At present short term credit is given too liberally and in an imbalanced form. In particular the practice of giving an arbitrarily fixed proportion of short term credit in the form of fertilizers should be stopped. Short term credit needs to be modified on the following pattern :

- (a) Credit should be given only for inputs which the cultivator is able and willing to use and for which credit is required.
- (b) Credit for farm inputs should be given only in kind to minimize misuse of credit and also to ensure equitable distribution of scarce supplies. Cash should be given mainly for those inputs which are not available from institutional sources. Cash for meeting other current farm expenditure like hired labour should be given only in exceptional circumstances (*viz.*, when the crops fail or if additional hired labour becomes necessary to adopt some recommended improved practices). Subsistence credit should be given only to the weaker sections of the cultivators.
- (c) Bigger cultivators can and should be made to meet the major part of their current farm expenses out of their own resources. Normally, they should be given only medium term and long term loans.

Once an initial impact has been made in a district, an efficient supplies organization is a vital complementary factor. In the intensive areas there is an urgent need for such an organization. The State and district level co-operative federations which now handle fertilizers should be disbanded. At the district level the supplies of inputs should be the direct responsibility of the programme administration. A special officer should look after the procurement, storage and dis-

tribution of supplies to primary co-operatives and departmental stores. The supplies officer aided by block level officers should regularly assess areawise demand for various inputs (the role of the village level worker in this is discussed in the next section) and allocate supplies according to priorities decided by the Project Officer. This type of organization will require careful co-ordination at the State and the national level.

Very often the targets for distribution of inputs differ from the actual demand leading to imbalances in supplies. In view of the increasing demand for inputs, it is essential to have systematic estimates of demand for various inputs for each agricultural season. The village level worker should be assigned with this responsibility at the village level. Before the start of each season, every cultivator should be asked to submit to the village level worker his requirements of various inputs for the next crop season. These estimates can then be consolidated at the village level and later at the block and the district level. According to this method, targets would be fixed not by officials but by the cultivators themselves. This will also give advance notice to the extension staff about the cultivators' intentions regarding the use of various inputs and the likely demand for extension service. This procedure will be effective in so far as village extension work is vigorously pursued (mainly through demonstration and complementary follow-up technique). It also implies close supervision of the village level worker and active support and checking on his work at the block and the district level.

Extension

The new strategy is heavily dependent on high powered extension and ready adoption by the cultivators of new inputs and techniques. The essence of the strategy is a nicely ordered balance between quantities of irrigation water, fertilizers, improved seeds and pesticides. It involves new techniques of irrigation and husbandry. Experience from most of the IADP districts suggests that the package is not being applied, not merely in terms of levels of application of inputs, but also in many cases in terms of absence of one or more of the input components themselves. While particular levels of input application and combination of inputs are recommended, these recommendations are seldom followed. This is after some years of operation of the programme. It is doubtful whether the cultivators will readily apply fertilizers even upto the lower (optimum) levels, defined by Minhas and Srinivasan. Plant protection is likely to offer a greater problem, judging by the low number of cultivators who now appear to be using this input. While the worth of the new varieties, according to reports, is likely to be quickly acknowledged, the adoption of new seeding techniques will probably take time.

The simple farm plan has proved of little use as an extension tool. Therefore, its preparation should be discontinued, specially when a farm plan is no longer a pre-condition for getting a co-operative loan. Though intensive farm plans can be of great use, with the limited staff at the disposal of the programme, the preparation of meaningful plans in a sufficiently large number is just not feasible.¹⁴ Therefore, the emphasis of extension work should be mainly on crop

14. A limited number of plans carefully prepared by senior extension personnel could, however, be of great use in exploring the problems hindering agricultural growth and finding solutions to these problems.

demonstrations and communication with the cultivators through group meetings, and intensive and meaningful individual contact.

So far the demonstrations have emphasized mainly the use of fertilizers and improved seeds. Now that the use of fertilizers has become more common at least in some areas, it is essential to demonstrate the use of certain techniques, specially water management. The extension aspect of the programme needs to be strengthened by building up a nucleus of well-trained field advisers to deal with the more sophisticated technical and managerial questions likely to arise in the near future with increasing frequency.

CONCLUSION

Whereas the principle of using scarce inputs in responsive areas is sound its translation into actual practice is hardly likely to be attained quickly. In so far as this is true, the lessons of the package programme should be applied in fixing realistic targets. The optimum performance level must be discounted by the extent to which supplies, distribution and adoption conditions are likely to be sub-optimum. The package programme, while it has much to commend it, is acknowledged to be an experimental type of programme and the lessons which have emerged from it should not be disregarded.

Since the intensive areas are on the frontier of agricultural development, a special effort should be followed there to arouse and maintain the interest and confidence of cultivators. To a large extent the present package programme is a watered-down version of the original concept. There is a similar danger that the intensive agricultural areas and the new strategy areas will also be shadows lacking in substance. If this is what the policy-makers want, then the fact should be recognized. If something much better is expected, let the inputs and facilities be provided so that better performance can be achieved through strenuous effort to eliminate weaknesses and to bring the basic conditions of the programme up to scratch. Otherwise the scale of intensive agricultural development should be proportionately reduced.

INTENSIVE CULTIVATION PROGRAMMES IN UTTAR PRADESH — A RETROSPECT*

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RATIONALE

The purpose of this paper is to make a survey of the genesis and rationale of the Intensive Cultivation Programmes in Uttar Pradesh, initiated at the instance of the Agricultural Production Team, sponsored by the Ford Foundation. The Team was of the opinion that there were no inherent, soil, climate or other phy-

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