EVALUATION AND MONITORING OF FOUR AGRI-DEVELOPMENT SCHEMES IN MAHARASHTRA STATE

GOKHALE INSTITUTE OF POLITICS AND ECONOMICS
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FOREWORD

At the suggestion of the Director of Agriculture, Government of Maharashtra, the present study on Evaluation and Monitoring of four schemes in operation in Maharashtra State since 1982-83 was taken up by the Agro-Economic Research Centre at the Gokhale Institute of Politics and Economics. The schemes covered under the present study are (i) Minikit (seed and fertilizer) Distribution Scheme, (ii) Plant Protection Scheme, (iii) Scheme for Popularization of Improved Implements and (iv) National Pulses Development Programme of the Central Government.

The work on the project was started in April 1985 and the field work was completed by March 1986. A Report on Monitoring of Minikit Scheme in kharif season was prepared and sent to the Director of Agriculture in December 1985. The results of evaluation studies of all the four schemes and the monitoring studies for kharif and rabi seasons are presented in this report.

Many difficulties were faced in the field work, beginning with the problem of getting complete lists of the farmers receiving benefits under various schemes. As the survey included 209 villages from 14 far-flung talukas, representing all the seven agro-climatic zones of the State, the investigational work was heavy. Computer processing of about 6,500 completed schedules proved to be a time taking operation particularly because of the heavy load on our computer system. Large-scale operation of data collection and computer processing have inherent problems that make it difficult to observe a strict time schedule dictated by monitoring studies.

The entire investigational work and data processing were completed by a team of field investigators and research assistants under the overall supervision of Dr. Rajendra Kulkarni. Dr.Kulkarni, however, left the Institute in October 1986 and could only start work on the final report. The responsibility of preparing the

final report was taken up by Dr. Sulabha Brahme. Mrs. Kumud Pore helped considerably in drafting the final report and Shri D.P. Apte critically read through the draft report.

The evaluated programmes were target oriented. Among the target groups marginal farmers did not receive preferential treatment under any of the schemes whereas small farmers were better represented. There were numerous operational problems that made it difficult to reach the target groups such as preparation of suitable lists of beneficiaries and local power elites cornering the benefits. There were shortcomings in the distribution of seeds, fertilizers and pesticides in terms of the areas suitable for each type of seed and fertilizer, and the timeliness of delivery.

The programmes, as conceived and implemented, had some serious limitations. Complementary inputs were needed to effectively use the packages distributed which the small farmers do not always have. Marginal farmers prefer to grow cereals for subsistence consumption rather than more risky cash crops. Pulses or oilseeds do not have a demonstrable edge over cereal crops to induce a shift. These new varieties or crops are often more capital-intensive and pest-sensitive. Some of the additional requisites for cultivation like agricultural implements and draught animals are not finely divisible, like seeds and fertilizers, to be used effectively on small plots.

These findings do provide some valuable lessons on the strategies to be pursued for meeting the twin objectives of increasing the area and aggregate production of specific crops like pulses and oilseeds on the one hand and, on the other, improving the productivity of small and marginal farmers by inducing them to adopt new varieties or crops and better farming practices. Obviously these objectives cannot be achieved by a single strategy or a set of disjointed programmes, designed regardless of variations in local conditions, soil type, water availability, farm size and complementary inputs.

The schemes under study supply, free of charge or at subsidized rates, various agricultural inputs and hence are popular. However, the study indicates that the total public and private costs involved are far higher than the benefits accruing to the farmer. This is mainly due to the unintegrated nature of the schemes and the distribution of benefits individually to separate farmers with small holdings. An integrated and comprehensive approach in planning and a cooperative mode of cultivation may be necessary if the marginal and small farmers are to reap the full benefits of these schemes and attain higher productivity levels. It is hoped that the findings from this study and the recommendations based on them would be given serious consideration by policy-makers and the Government.

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CHAPTER I

INTRODUCTION

I) Agricultural Extension work is a crucial input for increase in agricultural production and productivity. One of the important bottlenecks in this task has been the inadequacy of extension machinery. The National Agricultural Commission has also recommended expansion of the agricultural extension machinery.

Until 1962, all the workers in the agricultural extension machinery worked directly under the Director of Agriculture at the State Level. In 1962, with the coming in of Panchayat Raj, the Government accepted district as a unit for planning and created autonomous administrative bodies like Zilla Parishad and Panchayat Samiti at the district and taluka level respectively. Decentralization of the agricultural extension machinery followed as a logical corollary. The entire extension machinery was transferred to the Zilla Parishad and the Director of Agriculture had the responsibility of giving only technical guidance to the staff in this machinery.

The Department of Agriculture detailed some schemes of agricultural development like promotion of cash crops, management of seed-multiplication centres at the taluka level, etc. Until 1976, the agricultural assistants of the Zilla Parishads had also the duty of implementing the departmental schemes as agents of the agricultural department. However, in 1976, all these agricultural assistants were converted by the Rural Development Department into integrated village workers. They were appointed as Gramsevaks who are supposed to work as a multipurpose village level workers. With this development, the Director of Agriculture lost technical contact with such workers.

Another important development during the same period was the establishment of Agricultural Universities or Krishi Vidyapeeths. Before the establishment of these Universities, the Agricultural Educational Institutions and agricultural research

centres were also directly under the control of Director of Agriculture and so the Director of Agriculture could co-ordinate the activities of research, education and extension. However, with the establishment of Krishi Vidyapeeths research and education activities were transferred to the Universities.

The Block Development Officers, who are responsible for the implementation of the agricultural extension programme cannot give enough time for this work because of their multifarious responsibilities. Similar is the case with the Gramsevaks at village level. This was not certainly a very congenial situation for implementing fruitfully an extensive programme of agricultural extension.

It is in these circumstances that the Government was seriously considering the possibilities of reorganization of the agricultural extension machinery with a view to making it more effective. The Training and Visit (T and V) Programme has been a product of such reconstruction. The entire technical and administrative responsibility and control of the programme rests with the Department of Agriculture. The highlights of this Programme are (i) The workers/officers in this Programme are responsible for agricultural extension work alone; (ii) The extension workers visit the farms according to a predetermined schedule and use these visits for taking improved agricultural technology to the farmers as also for taking the problems of the farmers to the agricultural experts for discussion and solution; (iii) The agricultural extension workers participate in the continuing training programme conducted by the Agricultural Department wherein they exchange experiences and seek answers in the problems faced by the farmers in their respective areas.

The T and V programme was introduced in eight districts of Maharashtra in June 1981 and then gradually extended to cover all the districts in the State by 1st June 1982. The Programme has an innovative approach of transfer of technology from the

Agricultural Universities where agricultural research originates to the farm where it is ultimately designed to be used, through a well-organized network of training programme for agricultural extension workers, who are the crucial link between lab research and the end-use of research. It can truly be called lab to land programme.

At the regional level, a meeting is organized at the Agricultural University at the beginning of each agricultural season. This Regional Meeting is attended by subject experts from the various departments of the University and all the chief agricultural officers, agricultural development officers, agricultural officers and subject experts from all the districts under the jurisdiction of the University.

All new research relating to the crops in a particular season, is reported and its utility to the farmers is discussed at this meeting. A programme of agricultural extension relating to the use of improved seed, fertilizer, pesticide, etc., is prepared.

At the district level a two-day workshop is organized every month. On the first day a review is taken of the agricultural season in the previous month and problems therein. Problems brought in by the village extension workers/agricultural officers are thoroughly discussed by the subject experts and solutions are suggested. Allied topics such as social forestry, credit schemes for horticulture, irrigation, etc., are also discussed. At the end of the first day, guidance plan for the next month is prepared and appropriate messages are prepared for the farmers. The emphasis is on review of difficulties in the actual implementation of the programme and realistic guidance based on past experience. Second day is used for a visit to an appropriate agricultural research centre.

The third and the crucial phase in the training programme is the fortnightly one-day workshop for the village extension

workers at the Taluka Level. The participants are all the village extension workers, agricultural officers, subject experts and sub-regional agricultural officers. The fortnightly meetings review the agricultural season during the previous fortnight and instructions to farmers are prepared for the coming fortnight. Audio-visual aids are used to demonstrate the utility of new methods of cultivation, fertilizers, pesticides, etc.

The village extension workers posted at the local level are the crucial link between the University and the Department of Agriculture on the one hand and the cultivator on the other. They are responsible for taking the results of research to the cultivators as also for bringing their problems to the experts. The effectiveness of the whole programme of transfer of technology from the lab to the land thus depends on the efficiency of each link in the chain individually and all the links collectively.

II) The present study was taken up in the Agro-Economic Research Centre of the Central Ministry of Agriculture located at our Institute at the instance of the Government of Maharashtra. The main objectives of this study are (1) to see whether the implementation of the schemes in the field is as per the instructions issued, (2) to monitor the progress of the working of the schemes so as to enable the department to take corrective actions, (3) to evaluate the impact of the schemes in the light of the objective set out, to decide continuance or otherwise and the changes required to be made in the structure of the schemes, and (4) to explore research methodology for monitoring and evaluation studies. This could be useful, if the Government would plan to establish a monitoring and evaluation cell in the Department.

It was decided to do the work of monitoring and evaluation with regard to the following four schemes

(1) Minikit Scheme (seed and fertilizer)

(2) Plant Protection Scheme

(3) Improved Agricultural Implements Scheme

(4) Special Component Plan

The special component plan scheme was dropped from our study after some time, because the department had realized that the scheme was already assigned, for evaluation, to the Directorate of Economics and Statistics, Government of Maharashtra. Then, at a later date, this scheme was replaced by the National Pulses Development Programme in our study.

Minikit scheme is one of the ambitious schemes of the Government of Maharashtra and more than Rs. 8 crore have been spent on seed minikits in the period 1982-83 to 1985-86. Seed is one of the most crucial inputs which plays a vital role in increasing agricultural production and productivity. Minikits programme constitutes free distribution of packets of seeds of newly evolved varieties, with the intention of popularizing these varieties. During the four years under our study, the department had proposed to distribute over 68 lakh of seed minikits and about 59 lakh seed minikits were actually distributed under the minikits programme. Apart from seeds, packets of different types of fertilizers were also distributed. Less use or non-use of fertilizers can be said to be one of the main reasons for low yields in rainfed agriculture. The minikit schemes intend to overcome this tendency by inducing the farmers to use fertilizers by giving them free fertilizer minikits in the hope that once the farmers realize the importance and usefulness of fertilizers they will, on their own, start buying and using fertilizers. During the reference period of our study more than 29 lakh of fertilizer minikits were distributed. The minikit scheme gives emphasis on the pulses and oilseed crops. The target group of the scheme is marginal and small farmer who is to be helped through minikit seed distribution to adopt improved varieties and increase production. Special preference is to be given in operating the scheme to cultivators from scheduled castes (S.C.) and scheduled tribes (S.T.).

The main objective of the plant protection scheme is to

help the cultivators to control pests and diseases to minimize the losses in yields by giving them the necessary pesticides and insecticides at subsidized prices. Under this scheme, plant protection appliances like sprayers and dusters are also supplied to the farmers on subsidy. Approximately Rs. 2 crore have been spent between 1982-83 and 1985-86 on this scheme.

After the introduction of the T and V System of extension, many constraints impeding adoption of various extension recommendations by the farmers were recognized. A major constraint so identified, was lack of improved agricultural implements with the farmers. Relevance of improved agricultural implements is more pronounced for dry land farming, where farmers may have to quickly switch over from one crop to another, depending upon the behaviour of the monsoon. The improved agricultural implements scheme, started in the year 1983-84, aims to popularize and convince the common farmer, of the advantages of the improved implements. One of the most important constraints in popularizing improved implements, is the economically unsound condition of the farmers, especially of the marginal and small farmers, who continue to use the traditional implements. The scheme envisages to overcome this difficulty to some extent by providing subsidy to the farmers to enable them to purchase the improved implements. Under this scheme, more than Rs.50 lakh have been spent upto 1985-86.

The main objective of National Pulses Development Programme is to popularize improved varieties of pulse crops and larger area coverage under these crops. The Government of India has been providing financial assistance under the Centrally Sponsored Pulses Development Programme since 1981-82. In view of the need for achieving substantial increase in the production of pulses, the existing Centrally Sponsored Scheme has been reoriented and merged into a compact National Pulses Development Programme which is implemented in Maharashtra from kharif 1985-86. In the year 1985-86 an amount of about Rs.10 lakh has been

spent on this programme.[1]

III) For each of the above-mentioned schemes, the work of monitoring and evaluation was carried out in 14 talukas of 7 districts of the State. In the following section, we shall outline, very briefly, the course of the developments in the project.

The most important task before going into the field, was to get to know the various operational aspects of the schemes, the data sources and their location. A lot of effort and time was spent in doing this. Then, considering the large size and wide spread of the sample, it was decided to recruit Field Investigators and Research Assistants/Field Supervisors on a temporary basis to carry out the survey work for the proposed study. After recruitment, an intensive training programme was arranged for the Investigators in our Institute in Pune.

This training programme included a trip to Khed taluka in Pune district, for field experience. The pre-testing of the earlier designed questionnaires was also done during this field trip. The main objective of this field trip was to demonstrate to the investigators, as to how the information is collected from (a) secondary sources like Panchayat Samitis and Sub-Divisional Agricultural Offices and (b) individual beneficiaries of different schemes. Senior and experienced investigators were asked to accompany the newly recruited investigators and guide them whenever necessary. The questionnaires filled up by them were immediately scrutinized and mistakes were pointed out and explained so as to minimize the recording errors in the actual survey work. After the training programme, the Field Investigators were asked to report at their respective districts to start the survey work. They were given a letter of introduction by the Institute in order

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1 The source for all the expenditure figures mentioned above is the statement showing the plan outlay and expenditure incurred for the years 1982-83 to 1985-86, obtained from the Directorate of Agriculture, Government of Maharashtra.

to help them to deal with different officers at various levels. They were also given detailed written instructions for their ready reference during the survey work. During the entire course of the survey work, they were constantly in touch with the Institute through their weekly reports of work, letters and the field visits of the research in-charge and the field supervisors to supervise their operations at regular intervals.

Based on the observations made during the field trips, an impressionistic note was submitted to the Director of Agriculture in September 1985. After the survey work for the minikit scheme in kharif was over a quick analysis of the available data was attempted and a preliminary draft report was submitted in December 1985. The present report is the final report covering all the schemes taken up for the study.

IV) The concepts of monitoring and evaluation and the methodology of the present study are discussed in Chapter II. In Chapter III are presented the results of the evaluation survey of minikit scheme under which seed and fertilizer kits are distributed free. The minikit scheme was monitored in 1985-86 in both kharif and rabi seasons and the data obtained thereof are presented in Chapter IV. Chapter V is devoted to evaluation and monitoring of Plant Protection Scheme and Chapter VI to evaluation and monitoring of National Pulses Development Programme. Implementation and effectivity of the Improved Agricultural Implements scheme are examined in Chapter VII. In Chapter VIII summary of the survey results and recommendations based on the evaluation and monitoring study are presented.

CHAPTER II

APPROACH

2.1 Concept of Monitoring and Evaluation

'Monitoring is the provision of information, and the use of information, to enable management to assess progress of implementation and take timely decisions to ensure that progress is maintained according to schedule'.[1] Monitoring involves purposive collection of information and making use of that information to take timely decisions which could keep the project moving in the right direction.

Evaluation is a related activity but distinct from monitoring. While monitoring assesses whether project inputs are being delivered, are being used as intended and are having the initial effects as planned, evaluation is taken up to assess the overall project effects and their impact. The relative roles of monitoring and evaluation will vary with the type of the project. If the nature of the project is such that it involves supply over a wide area, of a well proven package aimed at a specific crop or farm activity, monitoring is more important than evaluation. However, if the project is innovative and is on a small scale, evaluation has an edge over monitoring activity. The best way to ensure the success of the project is to consider monitoring and evaluation as on integral part of one system, so that monitoring will test the efficiency of the project and evaluation will judge the effects and impact of the project.

2.2 Approach to the Study

The present study is a work of monitoring and evaluation of the four schemes mentioned with some detail in the earlier

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1 Dennis, J. Casley and Denis A. Lury, Monitoring and Evaluation of Agriculture and Rural Development Projects, IBRD (1982). For discussion of various aspects of monitoring and evaluation in this chapter, we have drawn heavily on the above-mentioned book.

chapter. The most important and common feature of these schemes is distribution of (either free or on subsidy) different inputs like seeds, fertilizers, pesticides, and improved implements with a view to propagate their use, especially among small and marginal farms. Our major objective in this study, as far as monitoring is concerned, is to see whether the above-mentioned inputs are distributed and used as intended. We shall also attempt to study some aspects of the infrastructure and the delivery system involved in the operations of the schemes. Such a study will be able to throw some light on the question of timeliness of the operations, organizational problems and other bottlenecks if any in the operation of the schemes. In the evaluation study we shall try to determine whether the project objectives have been met. The most important aspect of our study will be whether the beneficiaries have taken to the use of the propagated modern inputs, and more important, whether they have continued to do so.

2.3 Data Sources for Monitoring and Evaluation

Identification of data sources and assessment of existing data is a vital starting point for monitoring and evaluation. The main source of information, especially for monitoring, is the properly organized administrative records. It may not be sufficient to have administrative records alone. Also required is a system for their rapid collation and summarization in order to turn voluminous files into succint, decision oriented information.

Apart from the project records, reactions and responses of the recipients of the project inputs are an important source of information. Information on the recipients' attitudes and perceptions is important in order to explain any departure in response behaviour to the anticipated one in the project design. This may be able to explain, at least in part, the success or failure of the project. The information about the reactions of the recipients can be obtained with the help of a sample survey by canvassing properly designed questionnaires/schedules in the

study area. This can be supplemented by the observations made during the field trips by the Investigators, Supervisors and Researchers. Obtaining such field observations, through discussions with the beneficiaries and also with persons encountered casually, is an informal approach to data collection. Hence, it is not possible to substantiate each and every observation based on such informal data collection.

Each of the above-mentioned data sources has its own strengths and weaknesses and hence the best approach would be to combine all of them to collect as much information as possible.

2.4 Field Work

The work on the project was started in April 1985; the training of investigators and pilot testing of the schedule was completed by the beginning of June 1985. Nearly a month had to be spent for the collection of the lists of the beneficiaries under the four schemes for the selected villages. The work of filling in the schedules by personal interview was begun at the end of June 1985 and the work continued till March 1986. The work was so organized that the beneficiaries were approached soon after the operation of a particular scheme was over. For instance, to monitor the Rabi Minikit seed/fertilizer scheme of 1985, the beneficiaries were contacted in the months of January/February 1986.

For monitoring 1985-86 was taken as a reference year for all the four schemes. Both kharif and rabi seasons were taken into consideration. For evaluation the period of three years between the years 1982-83 to 1984-85 (all seasons) was the reference period for all the schemes except the Improved Implements Scheme. As this scheme became operational in the year 1983-84, the reference period for that scheme was between the years 1983-84 and 1984-85.

2.5 Methodology

Since the main thrust of our study is on finding out the operational efficiency and impact of the schemes in terms of the

objectives laid down, a field investigation of the study area was considered to be a suitable method for making such an assessment. The field investigation designed for this purpose was expected to generate a good deal of data. These data, analysed along with supplementary information obtained through sources mentioned earlier, were expected to give us a reasonable background to achieve our objectives.

Separate questionnaires/schedules were designed for each of the four schemes and for monitoring and evaluation. We have also made an attempt to study the infrastructure and delivery system to some extent. The information required for this purpose was also generated through questionnaires and personal interviews of the officials concerned.

The design of the field survey carried out is as follows:

First, seven districts in the State were selected at random but ensuring that only one district is selected from each of the seven agro-climatic zones into which the State is divided. Next, from each selected district, two talukas (blocks) were selected at random. From the selected talukas, a complete village-wise list of all beneficiaries under different schemes for the respective reference periods was obtained. With the help of this list, a random sample of villages was chosen. For the evaluation and monitoring studies of the four schemes the total number of beneficiaries to be covered was decided upon for each scheme. It was decided to cover all the beneficiaries in each selected village under the particular scheme. Therefore, only so many villages were selected from each taluka as would give a specified number of sample beneficiaries.

For the minikit scheme, for the evaluation study, 300 beneficiaries per district, distributed equally between the two selected talukas were surveyed. For the kharif monitoring 150 beneficiaries per district, distributed equally between talukas were selected. Similarly, for rabi monitoring another 150

beneficiaries per district, distributed equally between two talukas were surveyed.

For the plant protection scheme for the evaluation study, about 120 beneficiaries per district, distributed equally between the two selected talukas were surveyed. For the monitoring study, 60 beneficiaries for kharif and 60 beneficiaries for rabi, distributed equally between the two selected talukas were surveyed.

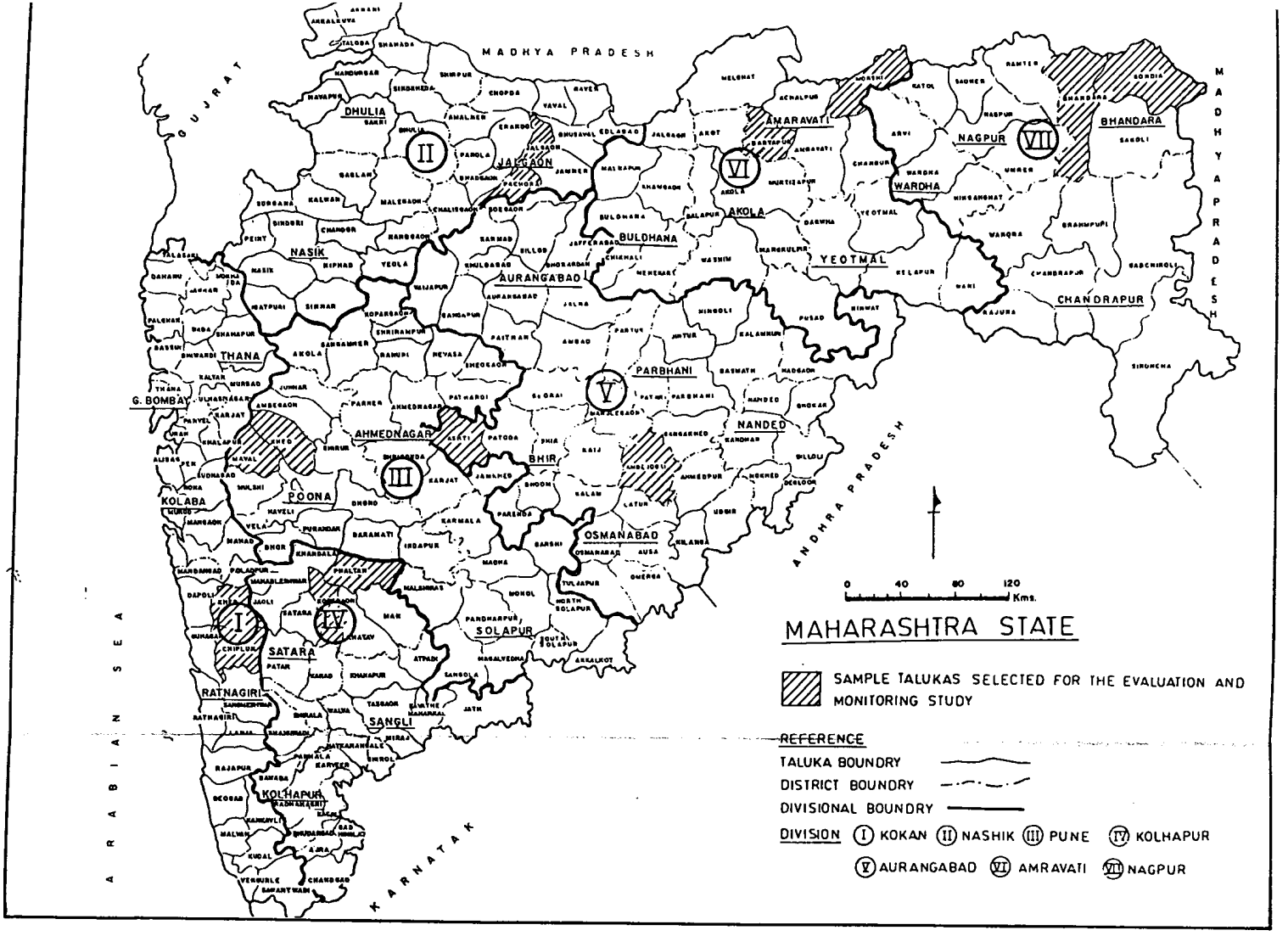
For the evaluation study of Improved implements scheme about 30 beneficiaries per district divided equally between two selected talukas were surveyed. For the monitoring study, another sample consisting of 30 beneficiaries per district from two talukas were selected.

As the beneficiaries of the National Pulses Development Programme were covered by the minikit scheme, there was no need to survey them independently. Beneficiaries who were given the minikits of pulses have been studied independently under monitoring and evaluation. Additional questionnaire was designed for such beneficiaries to get additional information to study the scheme.

As per the sample design, 14 talukas in 7 districts were selected and in all beneficiaries from 209 villages were surveyed. The selected districts, talukas and total number of villages covered in the district are as follows:

Name of the division	Name of the district	Names of the talukas	Total No.of villages covered in the district
1. Amravati	Amravati	1) Daryapur 2) Morshi	35
2. Aurangabad	Beed	1) Aashti 2) Ambajogai	18
3. Nagpur	Bhandara	1) Bhandara 2) Gondia	24
4. Nasik	Jalgaon	1) Jalgaon 2) Pachora	35
5. Pune	Pune	1) Khed 2) Maval	38
6. Konkan	Ratnagiri	1) Chiplun 2) Khed	24
7. Kolhapur	Satara	1) Koregaon 2) Phaltan	35
		Total	209

Note: See Appendix 1 for a complete list of sample villages.


MADHYA PRADESH
GUJRAT
MADHYA PRADESH
ANDHRA PRADESH
KARNATAK
ARABIAN SEA
DHULIA
JALGAON
AMRAVATI
BHANDARA
NAGPUR
WARDHA
AKOLA
BULDHANA
YEOTMAL
NASIK
AURANGABAD
PARBHANI
CHANDRAPUR
THANA
G. BOMBAY
AHMEDNAGAR
BHIR
NANDED
KOLABA
POONA
OSMANABAD
SOLAPUR
SATARA
RATNAGIRI
SANGLI
KOLHAPUR
I
II
III
IV
V
VI
VII
0 40 80 120 Kms.
MAHARASHTRA STATE
SAMPLE TALUKAS SELECTED FOR THE EVALUATION AND MONITORING STUDY
REFERENCE
TALUKA BOUNDRY
DISTRICT BOUNDRY
DIVISIONAL BOUNDRY
DIVISION (I) KOKAN (II) NASHIK (III) PUNE (IV) KOLHAPUR
(V) AURANGABAD (VI) AMRAVATI (VII) NAGPUR

We tried our best to adhere to the proposed sample design. Selection of districts and talukas posed no problems at all. However, selection of villages was very difficult. As stated, in our sample design, in order to select villages from each of the seven districts, we were required to obtain a complete villagewise list of all the beneficiaries under different schemes. The Office of the Director of Agriculture had informed us that the villagewise lists of beneficiaries will be available at the district level offices, (i) Zilla Parishad, in the case of plant protection scheme and improved implements scheme and (ii) the office of the PAO of the T and V in the case of the minikits scheme. However, we could not obtain this information at the district level. Even at the taluka level, this information could be obtained only after a lot of effort and time was spent. The Director of Agriculture himself had issued a circular (giving detailed proforma) to the concerned officers asking them to keep the information ready. Excepting two (out of fourteen) talukas, this information was not kept ready. It was found that the records were scattered and not compiled systematically although, the instructions issued by the Government are specific regarding the keeping of the records. It is not the case that the records are not maintained at all. What is lacking is a proper system to compile and convert the records into manageable, decision oriented information. Well-maintained records will help the department a good deal in the planning of distribution of inputs and will make the task of monitoring and evaluation easier.

In view of the limited budget provision and limited manpower for the survey work, we wanted to restrict the total number of villages to be surveyed. However, as all the schemes do not operate in each of the selected villages, we had to select different villages for different schemes. This increased the total number of villages to 209. So, in some cases, we had to ignore the principle of random selection of villages.

happened especially regarding Improved Implements Scheme where the beneficiaries were spread very thinly all over the taluka.

We have to say something about the quality of data also. It was our experience that collecting information from individual beneficiaries in the villages is becoming difficult day by day. As there are a large number of organizations and individuals collecting such type of information, the farmers are reluctant to spend their time for interview. Farmers have become cautious and many times they repeat what they think the Investigators expect them to say; or they just reproduce what they regard as the 'official' view, in the hope of receiving further favours or special treatment from their officials. All this does affect the reliability of the data.

Collecting information regarding the crop yields from the minikits distributed also posed several problems. First of all, we found that many farmers do not keep separate plots of .10 Ha. Even if separate plots are kept, harvesting is not done separately. This affects their assessment of the yield. It is also essential to note that for evaluation study, this information was collected for the years 1982-83, 1983-84 and 1984-85. Naturally, farmers found it difficult to recall the yields exactly. Many of these and such problems are likely to affect the reliability and the accuracy of the data.

APPENDIX I

LIST OF VILLAGES INCLUDED IN MONITORING AND EVALUATION STUDIES OF VARIOUS SCHEMES OF DEPARTMENT OF AGRICULTURE, MAHARASHTRA STATE

Name of Division and District	Taluka	Selected Villages
I. KONKAN		
Ratnagiri District	1) Chiplun	(1) Asurde (2) Kapare (3) Khershet (4) Miraone (5) Mundhe (6) Nandgaon (7) Pathardi (8) Shirgaon (9) Talsar.
	2) Khed	(1) Alsure (2) Borai (3) Chorvane (4) Dhamanand (5) Humbari (6) Jamage (7) Kalamni (8) Kondiwali (9) Kotawali (10) Posare (11) Savanas (12) Shivtar (13) Sukivali (14) Susheri (15) Songaon.
II. NASIK		
Jalgaon District	1) Jalgaon	(1) Asode (2) Avhane (3) Awar (4) Bhadli Bk. (5) Bhokar (6) Dhanwad (7) Kadgaon (8) Kandari (9) Khedi Kh. (11) Mamuarabad (11) Umale (12) Vidgaon.
	2) Pachora	(1) Anturli Bk. (2) Anturli Kh. (3) Bamburd (4) Duskhede (5) Galan (6) Kalamsare (7) Kurangi (8) Lohare (9) Lohari (10) Mondhale (11) Nandre (12) Nimbhori (13) Pardhade (14) Pimpalgaon (15) Savkhede Bk. (16) Savkhede Kh. (17) Sarole (18) Samner (19) Shindad (20) Tarkhede Bk. (21) Tarkhede Kh. (22) Wadi (23) Wanegaon.
III. PUNE		
Pune District	1) Khed	(1) Alandi (2) Avadar (3) Chaskaman (4) Chikhalgaon (5) Chimbali (6) Jaluke (7) Kadadhe (8) Kadus (9) Kanhewadi (10) Khed (11) Koyali (12) Manjerewadi (13) Mohokal (14) Pait (15) Pur (16) Saburdi (17) Theglesthal (18) Tifanwadi (19) Wada (20) Waki Bk.
	2) Maval	(1) Govhunje (2) Govitri (3) Induri (4) Jambhul (5) Kale Colony (6) Kanhe (7) Kamshet (8) Malewadi (9) Nane (10) Nanoli (11) Sate (12) Shivane (13) Somatane (14) Sudambare (15) Sudawadi (16) Talegaon (17) Umbare Navalakha (18) Wadgaon.

(continued)

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II. NASIK		
Jalgaon District	1) Jalgaon	(1) Asode (2) Avhane (3) Awar (4) Bhadli Bk. (5) Bhokar (6) Dhanwad (7) Kadgaon (8) Kandari (9) Khedi Kh. (11) Mamuarabad (11) Umale (12) Vidgaon.
	2) Pachora	(1) Anturli Bk. (2) Anturli Kh. (3) Bamburd (4) Duskhede (5) Galan (6) Kalamsare (7) Kurangi (8) Lohare (9) Lohari (10) Mondhale (11) Nandre (12) Nimbhori (13) Pardhade (14) Pimpalgaon (15) Savkhede Bk. (16) Savkhede Kh. (17) Sarole (18) Samner (19) Shindad (20) Tarkhede Bk. (21) Tarkhede Kh. (22) Wadi (23) Wanegaon.
III. PUNE		
Pune District	1) Khed	(1) Alandi (2) Avadar (3) Chaskaman (4) Chikhalgaon (5) Chimbali (6) Jaluke (7) Kadadhe (8) Kadus (9) Kanhewadi (10) Khed (11) Koyali (12) Manjerewadi (13) Mohokal (14) Pait (15) Pur (16) Saburdi (17) Theglesthal (18) Tifanwadi (19) Wada (20) Waki Bk.
	2) Maval	(1) Govhunje (2) Govitri (3) Induri (4) Jambhul (5) Kale Colony (6) Kanhe (7) Kamshet (8) Malewadi (9) Nane (10) Nanoli (11) Sate (12) Shivane (13) Somatane (14) Sudambare (15) Sudawadi (16) Talegaon (17) Umbare Navalakha (18) Wadgaon.

(continued)

Name of Division and District	Taluka	Selected Villages
IV. KOLHAPUR		
Satara District	1) Koregaon	(1) Chanchali (2) Chilewadi (3) Hasewadi (4) Jadhavwadi (5) Karanjkhop (6) Khed (7) Koregaon (8) Nagewadi (9) Naygaon (10) Phadtarwadi (11) Palashi (12) Pimpode Bk. (13) Solshi (14) Sonaki (15) Taliye (16) Vikhale (17) Wagholi (18) Wathar Station.
	2) Phaltan	(1) Barad (2) Choudharwadi (3) Dudhe Bavi (4) Girvi (5) Gokhali (6) Khunte (7) Kurvali Bk. (8) Mirdhe (9) Murum (10) Nimblak (11) Rajuri (12) Ravdi (13) Sangavi (14) Sastewadi (15) Taradgaon (16) Tirakwadi (17) Vidani.
V. AURANGABAD		
Beed District	1) Ashti	(1) Ashta (2) Chinchpur (3) Dhanora (4) Kada (5) Kelsangvi (6) Matavali (7) Matkuli (8) Morewadi (9) Nanda (10) Takalsing.
	2) Ambajogai	(1) Dharmapuri (2) Giroli (3) Javalgaon (4) Lokandi Savergaon (5) Pangri (6) Radi (7) Saigaon (8) Selu amba.
VI. AMRAVATI		
Amravati District	1) Daryapur	(1) Amla (2) Banosa (3) Chendakapur (4) Daryapur (5) Gaiwadi (6) Ghada (7) Golegaon (8) Kalashi (9) Lotawada (10) Mahuli (11) Mhaispur (12) Nalwada (13) Nardoda (14) Samda (15) Sangva Bk. (16) Thilori (17) Tonglabad (18) Wadnergangai (19) Yeoda.
	2) Morshi	(1) Ambada (2) Ashtagaon (3) Brahmanwada (4) Chincholi (5) Dapori (6) Hiwarkhed (7) Khanapur (8) Khopada (9) Maiwadi (10) Nerpinglai (11) Pala (12) Savangi (13) Shiralas (14) Vishnora (15) Yawali (16) Yerla.
VII. NAGPUR		
Bhandara District	1) Bhandara	(1) Berodi (2) Bhandara (3) Bhilewada (4) Davdipar-Bazar (5) Gunthara (6) Indurkha (7) Karchakheda (8) Kanhad Moh (9) Kharbi (10) Khursipar (11) Kodamendhi (12) Pahela (13) Parsodi (14) Sawari (15) Shahapur (16) Wakesar.
	2) Gondia	(1) Birsi [illegible] (2) Chargaon (3) Girola (4) Kamtha (5) Khatia (6) Panjara (7) Paraswada (8) Zilmili.

CHAPTER III

EVALUATION OF MINIKIT DISTRIBUTION SCHEME

One of the objectives of the present study is to evaluate the impact of the scheme in the light of the objectives set out. The evaluation of the scheme will, therefore, have to be made with reference to the stipulations of the scheme as well as with reference to the impact on the beneficiaries in terms of changes in the cultivation practices, introduction of new varieties of crops, increase in productivity and production and their intentions to stay with the new improved varieties and cultivation practices they have been initiated into through the T and V programme of extension and distribution of minikits.

I. Seed Minikit Distribution Scheme

The distribution of seed minikits for a large variety of crops has truly been a marathon operation in Maharashtra. The programme was launched in 1982 and it was planned to distribute 532400 minikits of cereals, oilseeds and pulses in that year. Actually 445792 minikits were distributed in the year 1982-83. The programme was stepped up considerably in the next year and the target for 1983 was set at about 20 lakh minikits. The achievement in 1983-84 and 1984-85 was about 94 per cent of the targeted quantum but in 1985-86 there was a shortfall by about 25 per cent. During the period 1982-1986, the Government of Maharashtra had thus planned to distribute over 68 lakh of seed minikits and did actually distribute about 59 lakh seed minikits. In addition about 30 lakh fertilizer minikits were distributed over the same period. The main thrust in this programme was planned to be on the oilseeds and pulses in order to step up their production. Over the last twenty years, there has been a large increase in the production of cereals, particularly wheat and the Government has built large stocks of wheat. However, there has not been any

important breakthrough in the production of pulses and oilseeds and yields continue to be low (Tables 3.1 and 3.2). With the introduction of hybrid cereal crops, the traditional mixed farming is on the decline and monoculture farming is undertaken even by the subsistence farmers. The T and V programme is therefore, especially directed to induce the farmers to shift to the cultivation of oilseed and pulses and it is planned to meet their cereal needs, if necessary, through public distribution system. Special efforts are to be taken to propagate non-traditional oilseeds like sunflower and soyabean along with the traditionally grown oilseeds. Similarly, the National Pulse Development Programme, which was launched in the face of stagnant production of pulses leading to a decline in the per capita availability of pulses threatening the nutritional levels in the country, also has a thrust on the promotion of cultivation of pulses through special efforts, encouragement and assistance to the farmers. The wisdom in traditional mixed farming, if systematically pursued with well-planned inter-cropping of some oilseed crops such as linseed, sunflower, mustard, safflower or pulses such as tur, green gram, black gram, chawli, hulga, has been proved by recent agricultural research as well. The programme, therefore, also was designed to educate farmers in systematic inter-cropping through free distribution of seed minikits of oilseeds and pulses. It was, therefore, expected that these stipulations would be reflected in the actual distribution of seed minikits.

3.1 Composition of Seed Minikits

Of about 59 lakh seed minikits distributed under this programme during the years 1982-83 to 1985-86, over 60 per cent were for cereal crops, about 23 per cent were for oilseeds and only around 17 per cent were for pulses (Table 3.3). Among the cereal crops, the major two cereal crops of Maharashtra viz., jowar and bajra claimed over 53 per cent of the total seed minikits distributed. In the oilseeds, however, about half the

Table 3.1: Area, Production and Productivity of Cereals, Pulses and Oilseeds in India During the Period 1950-51 to 1981-82

Year	Rice			Wheat			Total Cereals		
	Area '000 hectare	Production '000 tonnes	Yield per hectare (kg.)	Area '000 hectare	Production '000 tonnes	Yield per hectare (kg.)	Area '000 hectare	Production '000 tonnes	Yield per hectare (kg.)
1950-51	30810	20576	668	9746	6462	663	78230	42414	542
1955-56	31521	27557	874	12367	8760	708	87344	55805	639
1960-61	34128	34574	1013	12927	10997	851	92018	69314	753
1965-66	35470	30589	862	12572	10394	827	92385	62403	675
1970-71	37592	42225	1123	18241	23832	1307	101782	96604	949
1975-76	39475	48740	1228	20454	28846	1410	103727	107995	1041
1980-81	40152	53631	1336	22279	36313	1630	104210	118962	1142
1981-82	40706	53593	1317	22308	37833	1696	104948	121710	1160

(Continued)

Table 3.1: (Continued)

Year	Total Pulses			Total Oilseeds		
	Area '000 hectares	Production '000 tonnes	Yield per hectare (kg.)	Area '000 hectares	Production '000 tonnes	Yield per hectare (kg.)
1950-51	19091	8411	441	10727	5158	481
1955-56	23216	11045	476	12085	5734	474
1960-61	23563	12704	539	13770	6982	507
1965-66	22718	9944	438	15248	6396	419
1970-71	22534	11818	524	15418	9259	601
1975-76	24454	13040	533	15225	9910	651
1980-81	22457	10627	473	15621	8342	534
1981-82	23872	11351	475			

Source : Statistical Abstract of India, 1982.

Table 3.2 : Area, Production and Productivity of Cereals, Pulses and Oilseeds in Maharashtra State

Year	Area (in '000 hectares)	Production ('00 tonnes)	Yield per hectare (kg)
All Cereals			
1960-61	10606	67550	637
1975-76	10931	78687	720
1980-81	11233	89000	792
1984-85	11311	86215	762
All Pulses			
1960-61	2349	9889	421
1975-76	2914	11675	401
1980-81	2804	8312	296
1984-85	2833	11143	393
Groundnut			
1960-61	1083	7999	739
1975-76	854	6925	811
1980-81	712	4407	619
1984-85	737	7307	991

Source: Economic Survey of Maharashtra, 1985-86.

seed minikits distributed were for the new oilseed crop viz., sunflower (10.55 per cent) although the proportion for soyabean was negligible (0.27 per cent). Among the pulses, tur claimed 6.29 per cent, green gram 3.38 per cent, gram 3.97 per cent and black gram 2.51 per cent (Table 3.4).

If we consider the value of the minikits for different crop-classes a different picture emerges. The distribution of minikits and the value of minikits distributed during the period 1982-83 to 1985-86 is given in Table 3.5. The figures include seeds distributed under National Oilseeds/Pulses Development Programme as well. It will be observed that more than half of the total value of minikits was accounted for by oilseeds.

Table 3.3 : Percentage Distribution of Seed Minikits by Crop Category Distributed in Maharashtra State during the Period 1982-83 to 1985-86

Year	Total Minikits	Crop category				Total Minikits
		Cereals	Pulses	Oilseeds	Cotton	
		(Per cent minikits)				
1982-83	Proposed	47.94	24.04	28.02	-	100 = 532400
	Distributed	46.61	26.34	27.05	-	100 = 445792
1983-84	Proposed	60.43	15.60	23.97	-	100 = 1997880
	Distributed	61.63	14.53	23.84	-	100 = 1859947
1984-85	Proposed	62.05	14.63	23.07	0.25	100 = 2029700
	Distributed	63.32	13.80	22.62	0.26	100 = 1910185
1985-86	Proposed	54.93	23.07	18.56	3.44	100 = 2249300
	Distributed	55.93	20.24	21.21	2.62	100 = 1667512
Total for the period 1982-83 to 1985-86	Proposed	58.13	18.44	22.23	1.20	100 = 6809280
	Distributed	59.42	16.81	22.94	0.83	100 = 5883436

Table 3.4 : Cropwise Distribution of Seed Minikits Distributed in Maharashtra State (1982-83 to 1985-86)

Crop	Botanical name	Size of kit *	Total Minikits for the period 1982-83 to 1985-86	Percent Minikits
Jowar	Andropogon sorghum Brot.	1.00	1961491	33.34
Bajra	Pennisetum specutum Roem & Schult.	0.25	1175717	19.98
Paddy	Oryza sativa Linn.	2.50	296439	5.04
Nagli	Eleusine coracana Gaerth	0.50	20402	0.35
Maize	Zea mays Linn.	5.00	4116	0.07
Wheat	Triticum species	5.00	38188	0.65
Rala	Setaria italica Beauv.	0.25	1000	0.01
Tur	Cojanus cajan Milsp.	2.00	369923	6.29
Green Gram	Phaseolus radiatus Linn.	1.00	198632	3.38
Black Gram	Phaseolus mungo Linn.	1.00	147766	2.51
Chavali	Vingna catjang Walp.	1.00	3938	0.07
Masoor	Lens esculenta Moench.	4.00	1000	0.01
Gram	Cicer arietinum Linn.	5.00	233750	3.97
Kulith	Dolichos biflorus Roxb.	1.00	7500	0.13
Wal	Dolichos lablab Linn.	1.00	16983	0.29
Peas	Pisum arvense Linn.	6.00	6130	0.10
Ghevada	Dolichos lablab Linn. var. lignosus prain	2.00	2119	0.04
Groundnut	Arachis hypogea Linn.	15.00	297690	5.06
Sesamum	Sesamum indicum Linn.	0.25	118180	2.01
Sunflower	Helianthus annuus Linn.	1.00	620765	10.55
Safflower	Carthamus tinctorius Linn.	1.00	291768	4.96
Castor	Ricinus communis Linn.	0.50	1601	0.03
Soyabean	Glycinesoja sieb. & Zuce.	5.00	16142	0.27
Niger	Guizotia abyssinica Cass.	0.50	800	0.01
Linseed	Linum usitatissimum Linn.	1.00	110	Neg.
Mustard	Brassica nigra Koch.	0.50	2700	0.05
Cotton	Gossypium species	0.50	48586	0.83
			5883436	100.00

* Seed in each kit is sufficient for 0.10 Ha. area.

Table 3.5 : Distribution of Value of Minikits Distributed for Different Crop Categories

Crop category	Percentage distribution of minikits distributed during the period 1982-83 to 1985-86	Percentage distribution of total value of minikits
Cereals	59.16	23.54
Pulses	17.71	19.19
Oilseeds	22.34	56.90
Cotton	0.79	0.37
Total	100.00 = 61.5 lakh*	100.00 = Rs.8.36 crore

*Figures include minikits distributed under National Pulses/Oilseeds Development Programme.

Pulses, however, are not particularly emphasized both in the number of minikits as well as in the value of minikits.

As mentioned earlier, the programme was designed, particularly to induce farmers to grow oilseeds and pulses as also use new improved varieties for cereal crops. Therefore, it is not so much the value of minikits as the physical quantities of seed minikits that would result in an increase in the area under oilseeds and pulses and increase in the production of these crops.

To evaluate the minikit distribution programme, firstly the various aspects of the inputs delivery system are examined. This is followed by the presentation of the results of the sample survey of the beneficiaries who received seed and fertilizer minikits. Lastly assessment of the programme is attempted on the basis of both the survey data, and field observations and informal discussions.

3.2 Input Delivery System

Information on the working of the input delivery system was collected by making use of both, informal and formal approaches. During the course of the field work which lasted for about ten months, our research team discussed the operational

aspects of the scheme with a number of Village Extension Workers (VEW) and Agricultural Officers and other concerned officials informally, and made field observations. In addition structured schedules were used to get certain basic information. The three major points on which we had based our inquiry were (a) personal data (b) distribution and follow-up of minikits and (c) maintenance of records. In all, 101 VEWs from 7 selected districts were interviewed formally. We also tried to collect information from the Sub-Divisional Agricultural Offices by circulating questionnaires but the response, in spite of a number of reminders, was not satisfactory. We shall, therefore, concentrate our attention mainly on the functioning of the VEWs as the most important link between the delivery system and the beneficiary. As VEWs distribute minikits, supervise them and maintain the records, VEWs are the closest to the beneficiaries and, therefore, getting a feed-back from them is essential. At this stage, we want to point out that the information collected from the VEWs by talking to them informally was more useful than that collected through the structured questionnaires. It was our observation that, in spite of repeated requests to be frank, the VEWs were cautious in their response to the questionnaire when the replies were being recorded formally.

We present in the following data on age, education and training of the VEWs, their field experience and the problems they face in the implementation of the Minikit Scheme.

(i) Age: About 43 per cent of the VEWs of our sample, were below 30 years of age. About 22 per cent were between the ages of 31 and 40 years and the remaining 35 per cent were above 40 years. Thus, it appears that the sample comprises of a mixture of youth and experience.

(ii) Educational Qualifications: Majority of the VEWs (61 per cent) had a diploma in agriculture, 10 per cent were S.S.C. and 15 per cent were below S.S.C. level. About 14 per

cent were graduates in agriculture while there was one VEW who had post-graduate qualifications in agriculture (Table 3.6).

Table 3.6 : Distribution of VEWs by Educational Qualification

District	Educational qualification					Total
	Below S.S.C.	S.S.C.	Diploma in Agriculture	Graduate	Post-Graduate	
	(No. of VEWs)					
Ratnagiri	-	-	9	1	-	10
Jalgaon	1	1	14	-	-	16
Pune	3	1	7	1	-	12
Satara	1	1	8	5	-	15
Beed	-	2	8	3	1	14
Amravati	2	1	11	4	-	18
Bhandara	8	4	4	-	-	16
Total	15	10	61	14	1	101

(iii) Training: In our sample we found that nearly half of the VEWs who responded had not undergone any training, other than the fortnightly training, for the past two years or more (Table 3.7)

Table 3.7 : Distribution of VEWs by Period When Training Was Received

District	Training received within					Total
	Last 6 months	7 months to 1 year	1 year to 2 years	Before 2 years	No response	
	(No. of VEWs)					
Ratnagiri	-	1	1	1	7	10
Jalgaon	1	2	1	12	-	16
Pune	-	2	3	7	-	12
Satara	-	2	4	7	2	15
Beed	1	1	4	3	5	14
Amravati	-	3	12	2	1	18
Bhandara	5	1	-	7	3	16
Total	7	12	25	39	18	101

It is therefore suggested that the concerned authorities may look into this aspect. Daniel Benor and Michael Baxter the chief designers of this programme have recommended refresher courses which are important not only to enable VEWs to perform their expected functions satisfactorily but also to upgrade their professional competence as is required to meet effectively the increasingly professional and complex nature of their job.[1]

(iv) Transfers: In our sample, about 42 per cent VEWs were transferred once within a period of four years, while about 6 per cent were transferred more than once; the rest were not transferred. (Table 3.8) Almost all the transfers, we were told, were for the administrative reasons. Benor and Baxtor, while on personnel policies, have recommended 'Staff must be able and encouraged to stay in one position or field location for a meaningful period. A large part of extension's success depends on farmers' acceptance of staff and the staff's familiarization with local conditions.'[2]

Table 3.8 : Distribution of VEWs by Number of Times They Were Transferred

District	Not transferred	Transferred once	Transferred more than once	Total
	(Number of VEWs)			
Ratnagiri	3	7	-	10
Jalgaon	11	5	-	16
Pune	4	7	1	12
Satara	8	3	4	15
Beed	10	3	1	14
Amravati	15	3	-	18
Bhandara	8	8	-	16
Total	59	36	6	101

1 Daniel Benor and Michael Baxter. Training and Visit Extension. A World Bank Publication, p. 18.

2 Op.cit., p. 181.

(v) Stay at the Headquarters: During our field work, we had observed that a number of VEWs do not stay at the place of their headquarters. In fact, quite a few of them stayed at the taluka places (understandably for family reasons). Hence, they had to spend a lot of time in travelling to their place of work. However, when the same information was collected officially by canvassing questionnaires, we found that only about 15 per cent VEWs in our sample, reported that they did not stay in their respective headquarters. Majority of these came from the Jalgaon district. Importance of residence of the VEW at his headquarter or within his circle is obvious. Then alone, he will not waste time travelling, will become well-acquainted with the farming community and its resources, will be more readily accepted by the farmers and will always be available when required by the farmers.

(vi) Distribution of Minikits: The second and the most important point of our inquiry was the distribution of minikits by the VEWs. Our observations regarding this point are as follows:

(1) Table 3.9 gives the number of villages under the jurisdiction of VEWs distributing minikits. It can be seen that about 42 per cent of the VEWs had less than four villages under their jurisdiction to distribute the minikits. Another 42 per cent

Table 3.9 : Number of Villages Under the Jurisdiction of VEWs

District	No.of VEWs with villages under their jurisdiction			
	Less than 4 villages	5 - 9 villages	More than 9 villages	Total
Ratnagiri	9	1	-	10
Jalgaon	12	4	-	16
Pune	3	8	1	12
Satara	14	1	-	15
Beed	2	12	-	14
Amravati	1	7	10	18
Bhandara	1	9	6	16
Total	42	42	17	101

of the VEWs had 5 to 9 villages, while about 16 per cent VEWs had more than 9 villages under their control to distribute the minikits. The minimum number of villages for distribution for the VEWs in our sample was 1 village while the maximum number was 16 villages. It is evident that some VEWs had to cover a large number of villages making the task of distribution difficult. More villages means more time spent in travelling, in reaching those villages and this is likely to upset the time schedule. Naturally, some VEWs have suggested that the number of villages assigned to them should be reduced.

(2) The most important aspect of minikit distribution is making the minikits available to the beneficiaries in time. We had observed during our field work that the minikits are not reaching in time. So we asked the question, "whether there was delay in the supply of minikits?" to the VEWs in our sample. Their answers are tabulated in Table 3.10. About 46 per cent of the VEWs stated that they received minikits late and 13 per cent of the VEWs said that they had experienced delay in the supply 'sometimes', while the remaining VEWs stated that they received the supply of minikits in time. Thus over half the VEWs did not receive the minikits in time. Naturally, the further distribution of minikits to the beneficiaries was bound to be delayed.

Table 3.10 : Delay in the Supply of Minikits

District	Number of VEWs who			Total
	Received the supply late	Received the supply in time	Sometimes received the supply late	
Ratnagiri	8	-	2	10
Jalgaon	-	15	1	16
Pune	7	4	1	12
Satara	7	8	-	15
Beed	10	4	-	14
Amravati	9	2	7	18
Bhandara	6	8	2	16
Total	47	41	13	101

(3) Apart from receiving the supply of minikits late, the VEWs had a number of other difficulties regarding the distribution of minikits. The major difficulties are listed below:

(a) The most important and the most common difficulty was a limited number of minikits vis-a-vis a large number of beneficiaries aspiring for the minikits. This was particularly true for crops like groundnut. Hence, selection of beneficiaries and distribution proved to be extremely difficult. The VEWs were afraid that this was causing strained relationship between them and the farmers who do not get free minikits.

(b) Interference of the local politicians and pressure groups was also another difficulty faced by the VEWs. Some VEWs reported that they had to set aside rules and norms of distribution to please such pressure groups simply to survive and work in the villages. Such problems were reported mainly from Jalgaon district and from Pune, Satara and Amravati districts.

(c) Another difficulty pointed out by the VEWs in our sample was regarding the transport of minikits. Normally, transport upto the VEWs' headquarters was arranged by the Panchayat Samiti. However thereafter, transporting minikits up to the beneficiaries in each of the villages under their jurisdiction was the responsibility of the VEWs. They had to arrange either bullock-carts or take the minikits on their bicycles. Some of the VEWs pointed out that they had to spend a lot of money on transport. Many VEWs, therefore, suggested that the minikits should be transported up to each of the village under their control.

(4) An important point regarding the distribution of minikits is the rules and norms of distribution. It was our observation that all the VEWs were aware of these norms. However, their reaction regarding these norms were quite mixed. Some of the VEWs, while talking informally, plainly admitted that they had no time to select beneficiaries properly and whosoever, as long as he was a small or marginal farmer, got the news of the

arrival of the minikits and came to collect the minikits, got the minikits. The VEWs had no time to consider such factors like whether the beneficiary had the potential to grow new varieties, whether he was given the minikits earlier and whether he had used them properly. Some VEWs, as discussed earlier, had to set aside the norms of distribution because of the influential elements in the villages. Some of the VEWs we interviewed however said that they had taken special care so as to make selection of the beneficiaries according to the norms set. Many of the VEWs were of the opinion that minikits should be given to every one, including marginal and small farmers, who are really interested and who are desirous of making the best possible use of the minikit. Some of the VEWs suggested that to ensure best utilization of minikits, criteria for selection of the beneficiaries should be left to the VEWs.

(5) It was our observation that the relationship between the Zilla Parishad or Panchayat Samiti (which is the real input distribution agency) and the T and V division of the Agriculture Department appears to be quite strained on the issue of distribution of minikits. The VEWs, who belong to T and V system, argued that the role of the VEWs is mainly to impart technical knowledge and they should not spend their time in actual distribution. The Agricultural Officers and other officers of the T and V also supported this view and added that they are merely to advise about input availability and input use. The Panchayat Samiti Officers, however, argued that they had actually done a favour to the T and V system by allowing them to handle the inputs because, otherwise, the farmers will not listen to the VEWs. The argument is that it becomes very easy for the VEWs to persuade the farmers to use the improved varieties of seeds and fertilizer by actually distributing the minikits free of cost. This is a very practical argument and there is a strong element of truth in it. However, the VEWs feel that they are getting far more unpopularity and problems than the advantages of minikit distribution.

(vii) Maintenance of Records: The third point of our inquiry was regarding the maintenance of records. The VEWs have an important role to play since they keep the basic record of the beneficiaries and send copies thereof to their supervisors. In our sample of 101 VEWs, we found that all the VEWs had maintained a register of beneficiaries. Of these, about 65 per cent of the VEWs were aware of a specific proforma while the remaining were not aware of any such proforma. Apart from maintaining registers, all the VEWs had sent copies of this information (list or number of beneficiaries) to their superiors. However, it can be seen from the data given in Table 3.11 that there was a lot of variation in the pattern of sending this information.

Table 3.11 : Distribution of VEWs according to Authority to Whom Information Was Sent

Authority to whom information was sent	Percentage of VEWs sending copies of the information
Agricultural Officer (A.O.)	34
Sub-Divisional Agricultural Officer (S.D.A.O.)	16
Block Development Officer (B.D.O.)	Nil
A.O., S.D.A.O., and B.D.O.	20
A.O. and S.D.A.O.	23
A.O. and B.D.O.	7

Although, the instructions issued by the Government clearly say that the VEWs should send the information to the B.D.O.s, it can be seen from the above table, that in our sample, in only about 27 per cent of the cases, the copies have gone to B.D.O. Maintenance of records in this situation becomes extremely difficult. It was our feeling that the necessary importance was not given to maintenance of records at any level which creates problems for monitoring and evaluation. Simple steps for compilation of information right from the VEWs level can really

make the available information much more meaningful and useful. It was our observation that most of the VEWs do not send villagewise or cropwise information. A simple format designed for this purpose can make the same list of names or number of beneficiaries much more meaningful and easier for compilation at the next level.

(viii) Guidance to the Beneficiaries: Nearly all the VEWs claimed that they extended the necessary guidance as required under the scheme to the beneficiaries; in over two-third of the cases it was reportedly provided by visiting the farm, in about 12 per cent of the cases it was provided through group meeting and in another 10 per cent of the cases it was given while effecting distribution of the minikits. Demonstrations were reportedly arranged in a few cases (about 7 per cent).

(ix) VEWs' Evaluation: Majority of the VEWs said that they consider the Minikit Scheme to be successful because seed of improved varieties reached the farmer on a large scale and secondly, the farmers were provided with guidance necessary for shifting over to the cultivation of improved varieties under the aegis of the minikit scheme. Only a few opined that the scheme was not much successful due to a number of factors like fertilizer kit is not always given together with a seed minikit, area for which the seed is supplied is meagre, the instructions are not properly followed by the cultivators, inadequate rains, etc.

(x) Suggestions by VEWs: We had asked the VEWs to give their suggestions regarding the minikit scheme. The major suggestions are listed below:

Suggestions	No.of VEWs making the suggestion
i) More minikits should be made available for distribution	27
ii) Supply of minikits should be as per demand placed by the farmers and the VEWs	22
iii) Along with the seed and fertilizer minikits, pesticides also should be provided	18
iv) The seed given in the minikits should be sufficient for .40 Hq. and not .10 Hq. only	16

Suggestion	No.of VEWs making the suggestion
v) The area of operation per VEW should be reduced	13
vi) Minikits should not be distributed free but should be given on subsidy	9
vii) Minikits should be sent in time	8
viii) New varieties should be included under the scheme	8

3.3 The Sample Population

The sample drawn from seven districts selected for the evaluation study included 50 villages and covered 2,059 beneficiaries. (Table 3.12) These beneficiaries had received over the period of three years (1982-83 to 1984-85) a total number of 3,355 minikits. The crop-categorywise distribution of the minikits received by the beneficiaries covered in the sample is compared with that noted for the state as a whole. (Table 3.13)

It will be seen from Table 3.13 that the sample taken for the evaluation study is fairly representative of the crop category-wise minikit distribution in the state.

The cropwise composition of the seed minikits received by the sample beneficiaries is presented in Table 3.14. A total number of five cereal crops, seven pulses and seven oilseeds were received by the sample beneficiaries. Jowar is the major cereal, bajra and rice are the other cereals crops received by a significant number of the beneficiaries. Tur, gram, green gram and black gram were the main pulses and groundnut, safflower and sunflower, the major oilseed crops received by them. The number of minikits received in respect of crops like [illegible], wheat, [illegible], soyabean, niger, mustard, [illegible], chavali, masoor, [illegible], kulith, cotton was very small.

3.3.1 Sample Population by Size of Landholding

An important stipulation of the programme was that it should cover marginal farmers, small farmers and special

Table 3.12 : List of Villages Included in the Evaluation Study of Seed and Fertilizer Minikits Distribution Scheme

Name of Division and District	Taluka	Selected Villages
I. KONKAN		
Ratnagiri District	1) Chiplun	(1) Mundhe (2) Shirgaon (3) Talsar.
	2) Khed	(1) Alsure (2) Borai (3) Humbari (4) Kalamni (5) Kotawali
II. NASIK		
Jalgaon District	1) Jalgaon	(1) Asode (2) Kandari (3) Umale.
	2) Pachora	(1) Anturli Bk. (2) Bambrud (3) Wadi.
III. PUNE		
Pune District	1) Khed	(1) Chimbali (2) Kanhewadi (3) Mohokal (4) Tifanwadi.
	2) Maval	(1) Govitri (2) Jambhul (3) Kamshet (4) Kanhe (5) Nanoli (6) Sate.
IV. KOLHAPUR		
Satara District	1) Koregaon	(1) Phadtarwadi (2) Solshi (3) Vikhale.
	2) Phaltan	(1) Dudhe Bavi (2) Kurvali Bk. (3) Miradhe (4) Nimblak.
V. AURANGABAD		
Beed District	1) Ashti	(1) Matavali (2) Matkuli (3) Nanda.
	2) Ambajogai	(1) Radi (2) Saigaon (3) Selu amba.
VI. AMRAVATI		
Amravati District	1) Daryapur	(1) Amla (2) Kalashi (3) Nalwada.
	2) Morshi	(1) Ashtagaon (2) Khanapur (3) Yawali.
VII. NAGPUR		
Bhandara District	1) Bhandara	(1) Davdipar-Bazar (2) Gunthara (3) Khursipar (4) Kodamendhi.
	2) Gondia	(1) Kamtha (2) Panjara (3) Zilmili.

Table 3.13 : Percentage of Seed Minikits Distributed During 1982-83 to 1984-85 in Maharashtra State and Among Sample Beneficiaries by Crop Category

Crop category	Percentage of seed minikits distributed	
	Maharashtra State	Sample beneficiaries
Cereals	60.80	56.15
Pulses	15.45	19.07
Oilseeds	23.63	24.72
Cotton	0.12	0.06
Total	(100.00=42.2 lakh)	(100.00=3167)*

* For 188 Minikits information on crop was not available

Table 3.14 : Cropwise Distribution of Minikits Distributed to Sample Beneficiaries (1982-83 to 1984-85)

Crop	No.of minikits distributed	Percentage share
Jowar	860	27.16
Bajra	534	16.86
Rice	350	11.05
Nagli	29	0.92
Wheat	5	0.16
Groundnut	273	8.62
Sesamum	43	1.36
Sunflower	385	12.16
Soyabean	3	0.09
Safflower	77	2.43
Mustard	1	0.03
Niger	1	0.03
Tur	261	8.24
Green gram	96	3.03
Black gram	115	3.63
Gram	105	3.32
Chavali	10	0.32
Masoor	2	0.06
Kulith	15	0.47
Cotton	2	0.06
Total	3167	100.00

preference should be given to cultivators belonging to the Scheduled Castes and Scheduled Tribes. It would be instructive to examine to what extent preference has been extended to the economically and socially weaker groups.

Distribution of landholdings by size-class of operational holdings as noted in the 1976-77 Agricultural Census is presented for the seven districts selected for the present study in Table 3.15. It must be noted that the proportion of small and marginal cultivators is likely to have increased during the last decade due to sub-division;[1] however since districtwise data for recent years are not available, the 1976-77 data are used to be get an approximate picture of the land distribution.

If we consider the sample beneficiaries as a single group (Table 3.16) and compare it with all the selected districts as a single unit, then the two size-class distributions appear more or less similar. Thus, the distribution of beneficiaries of minikits does not reflect any special preference given to the small and marginal farmers. About 35 per cent of the sample beneficiaries reported larger than two hectare of landholding. There are significant differences in the seven districts in this regard. In Ratnagiri district, for example, the marginal landholdings (below 1 hectare of landholding) accounted for 48.38 per cent among the total landholdings, but the marginal farmers accounted for 77.58 per cent in the sample beneficiaries. The corresponding proportions in the Beed district, were 15.45 per cent and 54.63 per cent respectively. Preferential treatment appears to have been accorded to the marginal farmers in these two districts. While no preferential treatment seems to be accorded to marginal

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1 Provisional figures for the state as a whole are available for the 1980-81 Agricultural Census. It is noted that the proportion of marginal and small farmers in the state increased from 45.9 per cent in 1976-77 to 50.5 per cent by 1980-81. (Economic Survey of Maharashtra, 1985-86, Government of Maharashtra, Bombay, 1986, p. 79.)

Table 3.15 : Districtwise Percentage Distribution of Land-holdings by Size of Operational Holding (1976-77 Agricultural Census)

Size of land-holding (Hectares)	Percentage distribution of land-holdings							Seven Districts
	Ratnagiri	Jalgaon	Pune	Satara	Beed	Amravati	Bhandara	
Upto 1	48.38	18.59	30.41	41.92	15.45	18.86	46.13	33.45
1 to 2	16.22	24.30	19.04	21.29	18.72	27.04	23.66	20.85
Marginal + small holdings	64.60	42.89	49.45	63.21	34.17	45.90	69.79	54.30
2 to 4	16.28	27.96	21.83	19.89	25.28	25.47	18.11	21.49
4 to 10	14.24	24.08	21.35	13.76	29.44	22.00	10.24	18.65
Above 10	4.88	5.07	7.37	3.14	11.11	6.63	1.86	5.56
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source : Report of Agricultural Census 1976-77, Maharashtra State, Part I & II, 1980, pp. 115, 137, 159, 192, 236, 302, 346.

Table 3.16 : Districtwise Percentage Distribution of Minikit Beneficiaries by Size of Land-holding

Size of land-holding (Hectares)	Beneficiaries	District							Total
		Ratnagiri	Jalgaon	Pune	Satara	Beed	Amravati	Bhandara	
Upto 1	Number	218	41	62	49	165	51	121	707
	Percentage	77.58	13.62	21.31	16.12	54.63	17.17	42.76	34.33
1 to 2	Number	43	51	98	99	126	101	122	640
	Percentage	15.30	16.94	33.68	32.57	41.72	34.00	43.11	31.11
Marginal + small holdings	Number	261	92	160	148	291	152	243	1347
	Percentage	92.88	30.56	54.99	48.69	96.35	51.17	85.87	65.44
2 to 4	Number	14	80	78	111	9	77	34	403
	Percentage	4.98	26.58	26.80	36.51	2.98	25.50	12.01	19.57
4 to 10	Number	6	110	49	43	-	44	5	257
	Percentage	2.14	36.54	16.84	14.14	-	14.81	1.77	12.48
Above 10	Number	-	19	4	2	2	24	1	52
	Percentage	-	6.32	1.37	0.68	0.67	8.52	0.35	2.51
Total	Number	281	301	291	304	302	297	283	2059
	Percentage	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

farmers in Bhandara district and Pune district, they are under-represented in Amravati district and Jalgaon districts, and grossly neglected in Satara district. If we take marginal and small farmers together the economically weaker section among cultivators, again Ratnagiri, Beed and Bhandara stand out for fulfilling better the stipulations of the programme, while Satara and Jalgaon as the violators of this stipulation.

It may be noted that the VEWs of Jalgaon, Amravati, Pune and Satara districts faced some problems due to interference from the influential elements which might have perhaps affected the process of selection of the beneficiaries. The VEWs from Beed and Bhandara reported that they themselves made the lists at the village level and selected the beneficiaries carefully.

3.3.2 Scheduled Castes and Scheduled Tribes In the Sample Population

Another important stipulation was, as mentioned earlier, to give preferential treatment to the cultivators belonging to the Scheduled Castes and the Scheduled Tribes. In Table 3.17, we present the percentage proportion of the scheduled castes and scheduled tribes in the total rural population and among the male cultivators separately for each of the seven selected districts worked out on the basis of 1981 Population Census Data.[1] In Table 3.18 are presented the percentage proportions of the scheduled castes, scheduled tribes and others among the sample beneficiaries for each of these districts.

It will be observed that if the seven districts are taken as a whole, the Scheduled Castes formed 15 per cent of the total population while they formed 17.72 per cent among the sample beneficiaries. Since the sample beneficiaries were male

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1 The data on Scheduled Castes population are available for 1981 Census but those relating to Neo-Buddhists - the erstwhile Mahars, is not yet published. To estimate the total Scheduled Caste population the Neo-Buddhist population was projected on the basis of 1971 Census Data.

Table 3.17 : Percentage of Scheduled Castes and Scheduled Tribes in Total Rural Population and Among Male Cultivators in Selected Districts of Maharashtra (1981)

District	Percentage of Scheduled Castes*		Percentage of Scheduled Tribes	
	In total rural population	Among male cultivators	In total rural population	Among male cultivators
Ratnagiri	8	5	1.61	0.32
Jalgaon	13	5	10.00	5.13
Pune	11	3	6.41	7.63
Satara	13	5	0.66	0.31
Beed	15	4	1.00	0.39
Amravati	19	10	16.46	21.12
Bhandara	35	19	17.22	17.73
Seven Districts	15	7	7.34	6.76

* Estimated

Table 3.18 : Percentage of S.C. and S.T. Minikit Beneficiaries Among the Total Minikit Beneficiaries Covered in the Survey According to District

District	Beneficiaries	S.C. beneficiaries	S.T. beneficiaries	Other beneficiaries	Total beneficiaries
Ratnagiri	Number	62	-	219	281
	Percentage	22.06	-	77.94	100.00
Jalgaon	Number	18	13	270	301
	Percentage	5.98	4.32	89.70	100.00
Pune	Number	36	3	252	291
	Percentage	12.37	1.03	86.60	100.00
Satara	Number	79	-	225	304
	Percentage	25.99	-	74.01	100.00
Beed	Number	44	13	245	302
	Percentage	14.57	4.30	81.13	100.00
Amravati	Number	80	7	210	297
	Percentage	26.94	2.36	70.71	100.00
Bhandara	Number	46	16	221	283
	Percentage	16.25	5.65	78.09	100.00
Seven districts	Number	365	52	1642	2059
	Percentage	17.72	2.52	79.76	100.00

cultivators in the main, it would be appropriate to compare this proportion to the percentage of Scheduled Castes among the male cultivators in the seven districts together which was 7 per cent. In the case of the Scheduled Tribes, the percentage of Scheduled Tribes was 7.34 in the total population of the seven districts together and 6.76 among the male cultivators but only 2.52 per cent among the sample beneficiaries. The Scheduled Tribes were thus, on the whole, much neglected in the distribution of seed minikits.

In this regard also, there are significant differences between the districts. Except in Bhandara and Jalgaon, the Scheduled Caste cultivators seem to have received preferential treatment of some sort. The Scheduled Tribes, however, are grossly neglected even in districts where they form a sizable proportion of male cultivators. In Amravati and Bhandara districts, for example, their representation among the sample beneficiaries is quite low although they form 21.12 and 17.73 per cent respectively of the male cultivators in these districts. Similar is the case with Pune district. Considering the social and economic handicaps with which the tribals pursue their farming the VEWs and other Government officials should have taken particular efforts to identify and help them according to the stipulations of the programme. Table 3.19 presents distribution of minikits for different crops among beneficiaries with different size-class of land-holdings.

It will be observed that while cereal minikits reached slightly larger proportions of marginal farmers, the oilseeds and pulses minikits reached a slightly larger proportion of large farmers and even medium farmers in the case of pulses.

3.4 Variety-wise Composition of Seed Minikits

The variety-wise distribution of the seed minikits distributed in different districts is examined to note whether appropriate varieties reached the various agro-climatic zones (Table 3.20).

As most of the varieties can be sown in all the districts where that particular crop is suitable, we will consider only the

Table 3.19 : Distribution of Minikits of Different Crops According to Size of Land-holding of Beneficiaries

Crop	Land-holding size group in ha.					Total
	Upto 1	1 - 2	2 - 4	4 - 10	10 +	
	Per cent Minikits					
Jowar	25.93	31.05	24.88	15.23	2.91	100 = 860
Bajra	31.46	32.40	20.23	15.54	0.37	100 = 534
Rice	60.86	25.71	10.00	3.14	0.29	100 = 350
Total cereals	35.37	30.04	20.25	12.71	1.63	100 = 1778
Groundnut	33.34	30.40	16.48	15.38	4.40	100 = 273
Sunflower	35.84	35.07	15.84	10.39	2.86	100 = 385
Safflower	18.18	32.46	31.17	16.88	1.31	100 = 77
Total Oilseeds	33.21	32.69	17.62	13.41	3.07	100 = 783
Tur	21.84	42.15	16.48	15.32	4.21	100 = 261
Green gram	23.96	31.25	15.62	23.96	5.21	100 = 96
Black gram	24.34	25.22	17.39	25.22	7.83	100 = 115
Gram	30.48	24.76	28.57	13.33	2.86	100 = 105
Total pulses	26.33	33.11	18.21	17.71	4.64	100 = 604
Grand total	33.12	31.26	19.20	13.86	2.56	100 = 3167

Note: The row, Total cereals includes Nagli and wheat,
Total oilseeds includes soyabean, mustard, sesamum and Niger,
Total pulses includes Chavali, Masoor, Kulith,
Grand total includes cotton.

Table 3.20 : Varietywise Distribution of Seed Minikits Distributed During 1982-83 - 1984-85

A) Jowar

Variety	Jalgaon	Pune	Satara	Beed	Amravati	Bhandara
			Number of Minikits			
CSH 1	1	23	10	10	13	-
CSH 5	37	14	4	6	38	-
CSH 6	17	3	35	67	47	-
CSH 9	76	5	27	12	29	-
SPV 245	5	9	12	-	8	-
SPV 297	-	-	-	1	1	-
SPV 351	-	-	-	1	-	-
CSH 8R	9	29	40	14	-	4
SPV 86	22	16	32	40	-	6
RSV 9R	6	30	34	54	-	7
Total	173	129	194	205	136	17

B) Bajra

W.C.C. 75	52	94	81	160	5	-
B.J. 104	-	-	2	2	-	-
B.K. 560	10	6	1	1	2	-
ICMS-7703	25	30	19	32	5	-
MBH 110	3	1	-	-	-	-
BD 763	1	-	-	-	1	-
Total	91	131	103	195	13	-

C) Wheat

HD 2189	2	-	-	-	-	-
HD 2978	-	-	-	1	-	1
DWR 39	-	-	-	-	-	1
Total	2	-	-	1	-	2

D) Rice

Variety	Ratna-giri*	Pune	Bhan-dara	Variety	Ratna-giri	Pune	Bhan-dara
Ratna	42	-	14	SYE-75	-	-	11
Masuri	13	-	-	Pankaj	3	-	-
Ratnagiri-68	2	-	-	Karjat	60	7	-
Jaya	29	-	-				
R.P. 4-14	18	-	12	Sona	-	10	-
IET 75.75	-	-	1	Ambe Mohor 150	-	3	-
IET 1410			5				
Sakoli-6	1	-	47	Pusa 33	-	-	3
Shidewhai-65	-	-	36	HPW 617	-	2	-
Kaliga	-	-	4	PBN-1	2	-	15

* One each Minikit of Damodar, and Jagannath.

contd.

Table 3.20 : (contd.)

E) Groundnut

Variety	Ratna-giri	Jalgaon	Pune	Satara	Beed	Amra-vati	Bhandara
JL 24	15	40	55	18	17	36	10
M-13	-	3	-	-	-	3	-
TG-17	-	-	-	3	-	-	-
SB XI	69	-	-	-	-	1	2
Total	84	43	55	21	17	40	12

F) Sunflower

EC 68414	18	4	12	3	18	10	7
Modern	5	24	45	14	169	29	25
Total	23	28	57	17	187	39	32

G) Safflower

Tara	11	15	6	15	10	4	20
Bhima	4	4	-	-	-	1	2
Total	-	16 *	6	15	10	5	22

* One Minikit of N7 variety.

H) Tur

BDN 1	4	8	1	5	5	29	21
BDN 2	3	9	13	17	59	45	28
T-21	-	2	-	-	-	-	-
C-11	-	-	-	-	-	6	-

I) Green Gram

S-8	-	11	-	4	-	1	--
Kopergaon	1	3	12	6	2	16	10
J-781	-	6	-	-	3	-	-
Pusha Vaishakhi	7	-	-	-	2	-	-

J) Black Gram

T-9	-	47	2	7	2	10	4
No. 55	16	5	1	-	4	5	12

K) Gram

G1/G4	-	-	-	5	-	-	-
BDN 9-3	-	-	-	-	7	-	-
Chaffa	11	6	17	20	16	10	12
Annegiri	-	-	-	1	-	-	-

specific varieties recommended for particular areas and compare the actual distribution of minikits in different districts. It is observed that the seed distribution was, on the whole, according to the agro-climatic stipulations except in a few cases. Since not much consideration needs to be paid to the specific variety in the case of jowar and bajra, there is not much possibility of wrong varieties going to the beneficiaries. In the case of rice, the varieties like Ratnagiri-68, Karjat which are particularly suited to Konkan area were distributed in the Ratnagiri district and varieties like Sakoli, Shidewahi, Kalinga, etc., which are particularly suited to Vidarbha area, were distributed in the Bhandara district. So also, in the case of gram, varieties like B.D.N.9-3 suited to Marathwada were distributed in Beed district. In the case of tur also, C-11 variety, particularly suitable for Vidarbha, was distributed only in Amravati district.

In the case of green gram, the Kopergaon variety, specially recommended for Vidarbha, got distributed outside Vidarbha as well and J-781 variety, suitable for Western Maharashtra, got distributed in Beed and Jalgaon districts. In the case of black gram, the No. 55 variety, recommended for Khandesh, was distributed in Jalgaon as well as in other districts. In the case of groundnut, M-13 variety, particularly suitable for Western Maharashtra, was distributed in Amravati and Jalgaon districts. So, for these pulses and oilseed crops not much attention was given to the suitability of a specific variety in a particular agro-climatic zone.

3.5 Prior Knowledge and Use of Improved Varieties

The T and V Extension Programme was designed also to initiate new farmers into improved methods of cultivation, use of new seed varieties, fertilizers, etc.

The status of the sample beneficiaries regarding previous knowledge of the seeds distributed in minikits is presented for different size-classes in Table 3.21.

Table 3.21 : Number of Beneficiaries Having a Prior Knowledge of Improved Varieties by Size of Land-holding

Prior knowledge of improved varieties	Size of land-holding (Ha.)					Total
	Upto 1	1-2	2-4	4-10	Above 10	
	Number of beneficiaries					
Yes	71 (11.15)	101 (17.32)	91 (24.59)	95 (39.92)	14 (27.45)	372 (19.80)
No	566 (88.85)	482 (82.68)	279 (75.41)	143 (60.08)	37 (72.55)	1,507 (80.20)
Total	637	583	370	238	51	1,879*

* No response in 180 cases.

(Figures in brackets indicate percentages.)

Over 80 per cent of the beneficiaries reported no prior knowledge of the new varieties distributed through seed minikits. One can also see that there is not much difference in between the land-holding size-classes in this respect.

In Table 3.22, we present this information for the seven districts.

It will be observed that except in Jalgaon district, an overwhelming majority of the beneficiaries in all the other districts reported no prior knowledge about the new varieties distributed in the minikits. Our field observation, however, was that a large number of varieties distributed in the minikits were already established and accepted varieties of these crops in the surveyed areas. Considering this fact the response of the beneficiaries sounds surprising. It could be that many beneficiaries possibly knew and may have in fact used these varieties before but could not identify them by name or code number given by the agricultural research stations. That is why also, an overwhelmingly large majority of the beneficiaries reported that they had not tried or sown the improved variety before, which is consistent with their 'no prior knowledge' response (see Table 3.23).

Table 3.22 : Districtwise Distribution of the Beneficiaries with respect to Their Prior Knowledge of Improved Varieties

District	Number of beneficiaries having knowledge of improved varieties	Number of beneficiaries not having knowledge of improved varieties	No response	Total
Ratnagiri	2 (0.71)	234 (83.27)	45 (16.01)	281 (100)
Jalgaon	213 (70.76)	76 (25.25)	12 (3.99)	301 (100)
Pune	5 (1.72)	236 (81.10)	50 (17.18)	291 (100)
Satara	35 (11.51)	240 (78.95)	29 (9.54)	304 (100)
Beed	98 (32.45)	204 (67.55)	-	302 (100)
Amaravati	19 (6.40)	253 (85.19)	25 (8.42)	297 (100)
Bhandara	Nil	264 (93.29)	19 (6.71)	283 (100)
Total	372 (18.07)	1,507 (73.19)	180 (8.74)	2,059 (100)

(Figures in brackets indicate percentages.)

Table 3.23 : Distribution of Beneficiaries with respect to Their Prior Use of Improved Varieties by Size of Land-holding

Prior use of improved varieties	Size of land-holding (Ha.)					Total
	Upto 1	1 - 2	2- 4	4 - 10	Above 10	
	Number of beneficiaries					
Yes	29 (4.55)	54 (9.26)	78 (21.08)	92 (38.66)	12 (23.53)	265 (14.10)
No	608 (95.45)	529 (90.74)	292 (78.92)	146 (61.34)	39 (76.47)	1,614 (85.90)
Total	637	583	370	238	51	1,879*

* No response in 180 cases.

(Figures in brackets indicate percentages.)

3.6 Number and Type of Minikits Received

In order to ensure maximum coverage, it was also necessary to initiate new cultivators every year and season. It was expected that, once initiated, the cultivators, convinced of the benefits of using the new variety seed, would either use home-grown new seed or buy it from the market and stay with the new seed variety.

In Table 3.24 we present the distribution of beneficiaries according to the number of seed minikits they received during the period 1982-83 and 1984-85.

Table 3.24 : Distribution of Beneficiaries according to Number of Seed Minikits Received during 1982-83 to 1984-85 and Size of Land-holding

No. of kits per beneficiary	Size of land-holding (Ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	Number of beneficiaries					
1	357 (56.04)	335 (57.46)	244 (66.12)	133 (55.88)	32 (62.75)	1,101 (58.63)
2	186 (29.20)	135 (23.16)	66 (17.89)	56 (23.53)	14 (27.45)	457 (24.33)
3	69 (10.83)	81 (13.89)	31 (8.40)	23 (9.66)	2 (3.92)	206 (10.97)
4 and above	25 (3.93)	32 (5.49)	28 (7.59)	26 (10.93)	3 (5.88)	114 (6.07)
Total	637 (100.00)	583 (100.00)	369 (100.00)	238 (100.00)	51 (100.00)	1,878* (100.00)

* No response in 181 cases; of these 88 families reported that they had not received any seed minikit.

(Figures in brackets indicate percentages.)

It may be observed that on the whole, majority of the cultivators received only one minikit and that there was not much difference between the small and large farmers. About a quarter of the beneficiaries received two minikits, about a tenth of the beneficiaries received three minikits and the proportion of beneficiaries receiving four or more minikits was small.

This can be corroborated by looking at Table 3.25.

Table 3.25 : Distribution of Beneficiaries by Years in Which They Received Minikit and Size of Land-holding

Years	Size of land-holding (Ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	Number of beneficiaries					
Only 1982-83	43 (6.75)	45 (7.72)	63 (17.08)	61 (25.63)	33 (64.71)	245 (13.05)
Only 1983-84	225 (35.32)	183 (31.39)	160 (43.36)	90 (37.82)	8 (16.69)	666 (35.46)
Only 1984-85	157 (24.65)	180 (30.87)	83 (22.49)	47 (19.75)	4 (7.84)	471 (25.08)
1982-83 and 1983-84	13 (2.04)	10 (1.72)	9 (2.43)	6 (2.52)	3 (5.88)	41 (2.18)
1983-84 and 1984-85	156 (24.49)	109 (18.70)	32 (8.67)	26 (10.92)	3 (5.88)	326 (17.36)
1982-83 and 1984-85	17 (2.67)	18 (3.09)	5 (1.36)	4 (1.68)	-	44 (2.34)
All the three years	26 (4.08)	38 (6.51)	17 (4.61)	4 (1.68)	-	85 (4.53)
Total	637 (100.00)	583 (100.00)	369 (100.00)	238 (100.00)	51 (100.00)	1,878* (100.00)

* No response in 181 cases.

(Figures in brackets indicate percentages.)

It will be observed that about three-fourths of the beneficiaries obtained minikits only in one year. Those who obtained for two years mainly obtained them in 1983-84 and 1984-85, when, the programme caught up. Also, a substantial proportion of these came from marginal and small farmers. The number of beneficiaries receiving minikits in all the three years was small.

If we compare the yearwise distribution of minikits among different size-classes, it is clear that while in 1982-83, the marginal and small farmers did not receive much attention, there was a clear shift in favour of marginal and small farmers in 1983-84 and in 1984-85. The marginal and small farmers formed 35.9 per cent of total beneficiaries in 1982-83 but they formed

61.3 per cent and 71.5 per cent of total beneficiaries in 1983-84 and 1984-85, respectively.

The T and V programme of extension envisaged that the new seed varieties would be distributed along with the appropriate mix and dose of the fertilizer required. Distribution of beneficiaries receiving seed and fertilizer is presented in Table 3.26.

Table 3.26 : Distribution of Beneficiaries by Type of Minikit Received and Size of Land-holding

Type of minikit	Size of land-holding (Ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	Number of beneficiaries					
Only seed	189 (26.73)	171 (26.72)	169 (41.94)	122 (47.47)	33 (63.46)	684 (33.22)
Only fertilizer	38 (5.37)	34 (5.31)	14 (3.47)	8 (3.11)	-	94 (4.57)
Both seed and fertilizer	446 (63.08)	412 (64.38)	201 (49.88)	116 (45.14)	18 (34.62)	1,193 (57.94)
No minikit received	34 (4.82)	23 (3.59)	19 (4.71)	11 (4.28)	1 (1.92)	88 (4.27)
Total	707 (100.00)	640 (100.00)	403 (100.00)	257 (100.00)	52 (100.00)	2,059 (100.00)

(Figures in brackets indicate percentages.)

It will be observed that although majority of the cultivators received both seed and fertilizer, a substantial proportion viz., 33.22 per cent of the beneficiaries received only seed and no fertilizer. This must have affected the fruitfulness of the programme for these beneficiaries. The proportion of beneficiaries receiving fertilizer alone was small (4.57 per cent) and none of the large cultivator beneficiaries reported receipt of fertilizer alone. Comparison between different size class land-holders shows that whereas the proportions of cultivators receiving both seed and fertilizer were larger for marginal and small cultivators, those of cultivators receiving seed alone was somewhat larger for medium and large cultivators. It must be noted that 88

families included in the official lists of minikit beneficiaries said, when approached for the interview, that they had not received a single minikit during any of the three years. We had also experienced considerable difficulties in getting the lists of the beneficiaries. When the scheme has set a definite target group the proper selection of the beneficiaries and proper maintenance of records need to be carefully looked into.

3.7 Continued Use of Improved Varieties

The main thrust of the T and V Programme of extension was, as mentioned earlier, to educate and initiate the cultivators, particularly marginal and small cultivators into adopting new varieties of seeds. It was expected that once initiated and convinced about the benefits of the new variety, they would make efforts to increase the area under new varieties and continue to use the new varieties on their own.

Although a very large proportion of beneficiaries (75.88 per cent) reported continued use of improved varieties (Table 3.27), the drop-out rate was quite significant (23.64 per cent). When asked to state the reasons for not sowing the improved varieties, majority of the beneficiaries reported that they did not sow because they did not either receive the minikit or received it late (59.51 per cent) while around a third of them reported that they did not sow it because they did not find it profitable. If the sizewise distribution is considered it will be seen that among the small and marginal cultivators the drop-outs were mainly dependent on receiving free minikits for sowing new varieties (Table 3.28).

Of the beneficiaries who continued to sow the new varieties, about 75 per cent of the respondents reported that they had increased the area under new varieties (Table 3.29). This proportion was 90 per cent in the case of large farmers.

3.8 Use of Irrigation and Area Under Minikit Seed

Very few of the cultivators covered in the sample had access to irrigation. The distribution of minikits according to

Table 3.27 : Distribution of Beneficiaries According to Continuation/Non-Continuation of Improved Varieties and Size of Land-holding

Continued use of improved varieties	Size of land-holding (ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	No. of beneficiaries					
Yes	509 (79.90)	429 (73.71)	256 (69.19)	186 (78.15)	45 (88.24)	1425 (75.88)
No	127 (19.94)	149 (25.60)	112 (30.27)	51 (21.43)	5 (9.80)	444 (23.64)
Going to continue	1 (0.16)	4 (0.69)	2 (0.54)	1 (0.42)	1 (1.96)	9 (0.48)
Total	637 (100.00)	582 (100.00)	370 (100.00)	238 (100.00)	51 (100.00)	1878 * (100.00)

* No response in 181 cases

(Figures in bracket indicate percentage to the total)

Table 3.28: Reasons for Non-Continuation of Improved Varieties by Size of Land-holding

Reasons for non-continuation of improved varieties	Size of land-holding (ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	No. of beneficiaries					
Did not obtain Minikit again	50 (40.00)	61 (40.67)	55 (48.67)	18 (36.00)	1 (25.00)	185 (41.86)
Obtained Minikit late	24 (19.20)	31 (20.67)	18 (15.93)	5 (10.00)	-	78 (17.65)
Seed costly	7 (5.60)	7 (4.67)	2 (1.77)	2 (4.00)	-	18 (4.07)
Not a profitable crop	42 (33.60)	48 (32.00)	37 (32.74)	24 (48.00)	3 (75.00)	154 (34.84)
Sown another crop	2 (1.60)	3 (2.00)	1 (0.88)	1 (2.00)	-	7 (1.58)
Total	125 (100.00)	150 (100.00)	113 (100.00)	50 (100.00)	4 (100.00)	442 (100.00)

(Figures in bracket indicate percentage to the total)

Table 3.29 : Distribution of Beneficiaries According to Whether They Increased the Area Under Improved Varieties and Size of Land-holding

Increased the area under improved varieties	Size of land-holding (Ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	Number of beneficiaries					
Yes	503 (79.09)	427 (73.88)	255 (69.48)	186 (78.15)	46 (90.20)	1,417 (75.78)
No	131 (20.60)	145 (25.09)	109 (29.70)	51 (21.43)	4 (7.84)	440 (23.53)
Going to increase	2 (0.31)	6 (1.03)	3 (0.82)	1 (0.42)	1 (1.96)	13 (0.69)
Total	636 (100.00)	578 (100.00)	367 (100.00)	238 (100.00)	51 (100.00)	1,870* (100.00)

(Figures in brackets indicate percentages.)
* No response in 189 cases.

whether or not the crop was irrigated given in Table 3.30A shows that summer groundnut was the main irrigated crop. There were only a few cases of irrigated rabi jowar, wheat and gram and summer green gram.

The seed in each minikit was so adjusted as to be adequate for sowing .10 Ha. of land. It was noted that in about 77 per cent of the cases the reported area under one minikit was .10 Ha, it was more than .10 Ha only in 3 per cent of the cases and less in rest of the cases (Table 3.31). In the case of rice there was a belief that the seed was inadequate to sow .10 Ha of land and it was noted that only about 40 per cent of the rice minikits were sown in .10 Ha or more while in 36 per cent of the cases it was used to sow only .05 Ha and in 20 per cent of the cases less than .05 Ha. Cases of rice thus need to be investigated and adequate guidance has to be provided to the cultivators.

3.9 Utilization of Crop Production Raised from Seed Minikits

Information regarding utilization of the crop production by the beneficiaries is presented in Table 3.32.

Table 3.30A : Cropwise Distribution of Minikits Sown as Unirrigated

Crop	Irrigated	Unirrigated	Total minikits	Per cent unirrigated
	Number of minikits			
Cereals				
Jowar	118	742	860	86.28
Bajra	28	506	534	94.76
Rice	5	345	350	98.57
Nagli	-	29	29	100.00
Wheat	1	4	5	80.00
Oilseeds				
Groundnut	86	187	273	68.50
Sesamum	-	43	43	100.00
Sunflower	10	375	385	97.40
Soyabean	-	3	3	100.00
Safflower	5	71	76	93.42
Mustard	-	1	1	100.00
Niger	-	1	1	100.00
Pulses				
Tur	6	255	261	97.70
Green gram	9	87	96	90.62
Black gram	-	115	115	100.00
Gram	12	93	105	88.57
Masoor	1	1	2	50.00
Kulith	2	13	15	86.67
Chavali	3	7	10	30.00
Cotton	-	2	2	100.00

Table 3.30B: Districtwise Number of Minikits Sown as Unirrigated Crop

Crop	Ratnagiri	Jalgaon	Pune	Satara	Beed	Amravati	Bhandara	Total
	Percent Minikits Sown as Unirrigated							
Jowar	-	98.86	96.92	48.98	94.63	100.00	94.44	86.28
Bajra	-	100.00	96.18	78.64	99.49	100.00	-	94.76
Rice	98.31	-	100.00	-	100.00	-	98.65	98.57
Wheat	-	100.00	-	-	100.00	-	50.00	80.00
Groundnut	11.90	100.00	98.18	71.43	100.00	100.00	58.33	68.50
Seasamum	100.00	100.00	100.00	100.00	100.00	-	100.00	100.00
Sunflower	78.26	100.00	100.00	77.78	100.00	100.00	100.00	97.66
Safflower	-	100.00	100.00	66.67	100.00	100.00	100.00	93.42
Tur	100.00	100.00	100.00	77.27	100.00	100.00	98.11	97.69
Green gram	25.00	100.00	100.00	70.00	100.00	100.00	100.00	90.62
Black gram	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Gram	63.64	100.00	100.00	69.23	100.00	100.00	100.00	88.57
Kulith	86.67	-	-	-	-	-	-	86.67

Table 3.31 : Area Under Seed Minikits

	Area under seed minikit in Hectare								Total
	.01-.02	.03-.04	.05	.06-.07	.08-.09	.10	.11-.15	Above .15	
No.of total mini-kits sown	38	85	278	81	149	2406	45	54	3136
Per cent	1.21	2.71	8.87	2.58	4.75	76.72	1.44	1.72	100.00
No.of rice mini-kits sown	16	54	124	7	6	134	4	2	347
Per cent	4.61	15.56	35.73	2.02	1.73	38.62	1.15	0.58	100.00

It may be observed that in the case of cereal crops, a large bulk of the production was used for household consumption. Less than 30 per cent of the production was brought to the market in the case of jowar, bajra and wheat. For paddy and nagli, this percentage was negligible. Around ten per cent of the paddy production was kept for use as seed. This percentage was about six in the case of wheat and negligible for jowar and bajra.

In the case of oilseeds, about three quarters of the production was sold in the case of sunflower and safflower and around one-fifth was used for home consumption. For groundnut and sesamum, around sixty per cent of the production was used for home consumption. A little over fourteen per cent of the groundnut production was reported as used for seed. The sale of crop as seed was negligible for all oilseed crops, except groundnut and sesamum.

In the case of pulses, all the production of kulith and chavali was used for household consumption. This proportion was around 50 per cent in the case of tur, green gram and black gram

Table 3.32 : Utilization of Crop Produced Under Minikit Scheme

Size of land-holding (hectares)	Crop	Percentage utilization of crop					Total production (in kg)
		Produce sold	Preserved as seed	Sold as seed	Consumed	Given in wages	
Upto 1	Jowar	32.17	0.14	0.24	66.65	1.91	100=24808
	Bajra	30.05	1.29	0.21	67.50	4.64	100=11639
	Rice	1.04	8.16	0.82	89.54	0.19	100=26986
	Groundnut	5.82	5.98	0.21	82.27	6.03	100= 9618
	Sunflower	89.44	1.50	0.58	14.09	0.87	100= 5188
	Tur	43.05	8.01	0.66	48.20	0.21	100= 2423
	Green gram	46.98	2.68	0.00	53.69	0.00	100= 894
	Black gram	25.87	1.20	1.20	71.72	0.00	100= 831
	Gram	24.25	8.08	2.31	63.82	1.54	100= 1299
1 to 2	Jowar	30.00	0.37	0.43	68.61	1.35	100=36282
	Bajra	26.51	0.04	0.14	73.47	4.70	100=14159
	Rice	0.00	11.56	1.72	86.81	0.00	100=11351
	Groundnut	20.57	14.71	7.36	54.26	3.83	100= 8089
	Sunflower	81.38	1.75	0.72	16.42	9.94	100= 5531
	Tur	38.13	11.34	0.84	47.07	2.15	100= 5124
	Green gram	52.54	4.87	1.06	40.47	1.06	100= 944
	Black gram	47.07	4.62	0.90	45.38	0.00	100= 888
	Gram	34.94	8.82	0.57	55.67	0.00	100= 873
2 to 4	Jowar	15.93	0.88	0.00	81.86	2.02	100=30040
	Bajra	10.39	1.78	0.00	87.59	0.30	100=13912
	Rice	0.00	12.01	3.40	83.18	0.00	100= 3531
	Groundnut	38.58	20.82	4.60	35.63	0.00	100= 5327
	Sunflower	54.12	9.08	0.72	35.08	0.00	100= 1796
	Tur	27.12	11.05	1.02	60.81	0.00	100= 1475
	Green gram	29.21	6.11	2.04	53.12	6.79	100= 736
	Black gram	39.40	6.41	4.58	49.60	0.00	100= 873
	Gram	25.30	11.61	1.08	62.94	0.00	100= 1395
4 to 10	Jowar	32.64	0.23	0.00	65.53	4.72	100=22163
	Bajra	29.51	2.00	1.79	64.18	1.87	100=13968
	Rice	0.00	21.05	0.00	78.95	0.00	100= 1615
	Groundnut	36.03	22.63	2.05	37.43	0.00	100= 5370
	Sunflower	65.63	5.14	0.43	28.92	0.00	100= 1615
	Tur	39.98	4.94	0.64	54.43	0.00	100= 2326
	Green gram	28.38	5.68	0.80	61.55	2.00	100= 1251
	Black gram	37.42	11.64	1.04	45.05	0.00	100= 1443
	Gram	33.66	14.85	0.00	51.49	0.00	100= 1010
Above 10	Jowar	42.57	0.00	0.00	53.01	4.42	100= 3735
	Bajra	75.00	0.00	0.00	25.00	0.00	100= 100
	Rice	-	-	-	-	-	-
	Groundnut	15.76	8.40	8.40	67.44	0.00	100= 952
	Sunflower	70.90	0.50	0.00	16.17	12.44	100= 402
	Tur	69.25	0.00	0.00	30.75	0.00	100= 361
	Green gram	65.22	0.00	0.00	34.78	0.00	100= 460
	Black gram	73.82	6.50	4.92	14.76	0.00	100= 508
	Gram	0.00	2.33	0.00	97.67	0.00	100= 215

and over sixty per cent in the case of masoor and gram. About 40 per cent of production of tur, green gram and black gram was sold.

Thus, on the whole, while cereal production was mainly used for household consumption, the production of oilseeds and pulses was partly sold, partly saved as seed and about half was used for household consumption.

There was not much difference in the utilization pattern of cereal crops in between the beneficiaries with different size classes of landholdings. However, in the case of sunflower and pulses, large farmers sold about 70 per cent of the produce while marginal and small farmers sold about 25 to 40 per cent of the produce excepting sunflower where over 80 per cent of the produce was sold.

The T and V Programme envisaged that the beneficiaries of the minikit programme would obtain seed from their own production on the basis of which they would increase area under cultivation of improved varieties. The districtwise information regarding the sources of seed for increasing the area under improved varieties of seeds of different crops is presented in Table 3.33 and size-classwise presented in Table 3.34.

It will be seen from Table 3.33 that in Jalgaon and Beed districts, most of the beneficiaries used the yield from the first minikit for increasing the area under new varieties for almost all the crops. In Bhandara district, the proportion of farmers using production of the first minikit for increasing the area under new varieties was substantial for paddy, groundnut and tur. In Pune district, it was substantial for groundnut and sunflower and in Satara district for groundnut, and tur while in Amravati district, very few beneficiaries reported this source of seed for increasing the area under new varieties.

Table 3.33 : Source of Seed for Increasing Area Under Improved Seed According to District

District	Crop	(1) Yield from the first Minikit	(2) Bought seed from the market	(3) Obtained seed Minikit again	1+2	2+3	Total*
		--------Figures in percentage ------					
Ratnagiri	Rice	58.98	20.51	12.82	6.41	1.28	100=156
	Groundnut	47.89	8.45	43.66	-	-	100= 71
	Sunflower	33.34	-	33.33	-	33.33	100= 3
	Tur	100.00	-	-	-	-	100= 3
Jalgaon	Jowar	95.34	2.33	2.33	-	-	100=172
	Bajra	98.89	-	1.11	-	-	100= 90
	Groundnut	95.35	4.65	-	-	-	100= 43
	Sunflower	50.00	46.15	3.85	-	-	100= 26
	Tur	94.45	5.55	-	-	-	100= 18
Pune	Jowar	3.33	78.89	15.56	-	2.22	100= 90
	Bajra	9.65	60.53	19.30	1.75	6.14	100=114
	Rice	58.83	29.41	11.76	-	-	100= 17
	Groundnut	88.68	9.43	-	-	1.89	100= 53
	Sunflower	57.15	28.57	9.52	2.38	-	100= 42
	Tur	81.82	18.18	-	-	-	100= 11
Satara	Jowar	16.54	67.67	12.03	0.75	3.01	100=133
	Bajra	3.39	62.71	33.90	-	-	100= 59
	Groundnut	80.00	15.00	5.00	-	-	100= 20
	Sunflower	46.15	46.15	7.70	-	-	100= 13
	Tur	76.47	17.65	5.88	-	-	100= 17
Beed	Jowar	99.51	-	0.49	-	-	100=205
	Bajra	97.45	-	2.55	-	-	100=196
	Rice	100.00	-	-	-	-	100= 1
	Groundnut	100.00	-	-	-	-	100= 18
	Sunflower	100.00	-	-	-	-	100=187
	Tur	98.44	-	1.56	-	-	100= 64
Amravati	Jowar	0.93	92.59	1.85	1.85	2.78	100=108
	Bajra	-	85.71	-	-	14.29	100= 7
	Groundnut	11.76	64.71	-	17.65	5.88	100= 34
	Sunflower	-	85.19	-	3.70	11.11	100= 27
	Tur	3.64	63.64	-	27.27	5.45	100= 55
Bhandara	Jowar	69.24	-	15.38	7.69	-	100= 13
	Rice	79.82	-	17.54	-	-	100=114
	Groundnut	90.00	-	-	10.00	-	100= 10
	Sunflower	85.71	14.29	-	-	-	100= 7
	Tur	89.14	-	6.52	-	-	100= 46

* Total includes a few cases not shown separately in the Table where all the three sources were used.

Table 3.34 : Source of Seed for Increasing Area Under Improved Seed by Size of Land-holding

Size of land-holding (hectares)	Crop	Sources of increasing area under improved varieties					Total*
		Yield of Mini-kit (1)	Purchase (2)	New Mini-kit (3)	1+2	2+3	
		Figures in percentage					
Upto 1	Jowar	8.33	45.23	41.67	0.60	3.57	100 = 168
	Bajra	8.45	35.21	47.89	4.23	3.52	100 = 142
	Rice	65.76	13.04	14.13	4.89	1.09	100 = 184
	Groundnut	50.63	10.13	35.44	2.53	1.27	100 = 79
	Sunflower	18.18	18.18	55.56	1.01	7.07	100 = 99
	Tur	38.64	15.91	38.64	4.54	2.27	100 = 44
1 to 2	Jowar	6.64	54.98	35.54	-	2.84	100 = 211
	Bajra	6.43	39.28	46.43	1.43	5.00	100 = 140
	Rice	81.82	7.58	9.09	1.51	-	100 = 66
	Groundnut	50.00	23.68	22.37	2.63	1.32	100 = 76
	Sunflower	7.77	21.36	65.05	1.94	3.88	100 = 103
	Tur	43.48	17.39	29.35	7.60	-	100 = 92
2 to 4	Jowar	5.88	75.29	10.59	2.35	4.71	100 = 170
	Bajra	4.30	65.59	22.58	3.23	3.23	100 = 93
	Rice	48.15	22.22	25.93	-	-	100 = 27
	Groundnut	73.17	14.63	-	12.20	-	100 = 41
	Sunflower	32.43	45.95	13.51	5.41	-	100 = 37
	Tur	40.00	50.00	-	10.00	-	100 = 30
4 to 10	Jowar	7.89	84.21	4.39	2.63	-	100 = 114
	Bajra	7.35	79.42	10.29	1.47	1.47	100 = 68
	Rice	50.00	20.00	30.00	-	-	100 = 10
	Groundnut	57.89	26.32	5.26	10.53	-	100 = 38
	Sunflower	39.13	39.13	8.70	8.70	4.34	100 = 23
	Tur	35.48	41.94	-	16.13	6.45	100 = 31
Above 10	Jowar	4.55	86.36	-	4.54	4.55	100 = 22
	Bajra	50.00	-	50.00	-	-	100 = 2
	Rice	-	-	100.00	-	-	100 = 1
	Groundnut	18.18	63.64	-	9.09	9.09	100 = 11
	Sunflower	10.00	70.00	20.00	-	-	100 = 10
	Tur	12.50	50.00	-	25.00	12.50	100 = 8

* Total includes a few cases not shown separately in the Table where all the three sources were used.

The second main source was the market. A large number of beneficiaries obtained seed from the market in Amravati, Pune and Satara districts, particularly for cereal crops. In Amravati district, substantial proportions of beneficiaries bought seed from the market for groundnut, sunflower and tur as well. A few beneficiaries obtained second minikit specially for cereal crops and groundnut in various districts.

If the sizewise distribution is examined, it is observed that there is no definite trend, in the use of seed from minikit yield, but a larger proportion of marginal and small cultivators reported new minikit as an important source for increasing the area under new varieties.

II. Fertilizer Minikit Distribution Scheme

Along with the improved seed, fertilizer is an important input for attaining higher production and productivity, particularly in the case of improved varieties. The T and V programme of extension, therefore, included distribution of fertilizer along with the seed and, as mentioned earlier, majority of the beneficiaries did receive seed and fertilizer minikits, although a significant proportion did not receive fertilizer but received only seed minikit.

Of the total 2059 beneficiaries of the programme interviewed, 772 did not receive any fertilizer minikit (see Table 3.26) which means that about 62 per cent of the beneficiaries received fertilizer minikits. Of these a small proportion (about 8 per cent) received fertilizer minikit only.

3.10 Composition of fertilizer minikit beneficiaries

The T and V Programme started with the Kharif season of 1982-83; the programme got momentum only in the kharif of 1983-84. Around 40 per cent of the total sample beneficiaries receiving fertilizer minikits received them for the kharif

season of 1983-84. From 1982 to 1985, kharif being the main cropping season, a large majority of the beneficiaries of fertilizer minikits (71.95 per cent) received them in the kharif season, around a fourth received them for the Rabi season and the rest (2.62 per cent) for the summer season. There was not much difference between the size-class of holders. (Table 3.35).

Over eighty per cent of the fertilizer beneficiaries received only one fertilizer minikit (Table 3.36). About thirteen per cent, mostly marginal and small farmers (131 out of 170), received two fertilizer minikits each. Very few farmers (29 in number) received more than two fertilizer minikits.

Table 3.35 : Distribution of Beneficiaries Receiving Fertilizer Minikits According to Year and Size of Land-holding

Year	Size of land-holding (Ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
Only 1982-83	24 (4.96)	26 (5.83)	25 (11.63)	17 (13.71)	10 (55.55)	102 (7.93)
Only 1983-84	197 (40.70)	168 (37.67)	90 (41.86)	60 (48.39)	3 (16.67)	518 (40.25)
Only 1984-85	199 (41.12)	165 (37.00)	77 (35.81)	38 (30.64)	2 (11.11)	481 (37.37)
1982-83 and 1983-84	2 (0.41)	8 (1.79)	-	2 (1.61)	-	12 (0.93)
1983-84 and 1984-85	38 (7.85)	61 (13.68)	17 (7.91)	4 (3.23)	-	120 (9.32)
1982-83 and 1984-85	3 (0.62)	5 (1.12)	2 (0.93)	2 (1.61)	-	12 (0.93)
All three years	7 (1.45)	8 (1.79)	3 (1.40)	-	-	18 (1.40)
Non-reporting	14 (2.89)	5 (1.12)	1 (0.46)	1 (0.81)	3 (16.67)	24 (1.87)
Total	484 (100.00)	446 (100.00)	215 (100.00)	124 (100.00)	18 (100.00)	1,287* (100.00)

* No fertilizer minikit received in 772 cases.

Table 3.36 : Distribution of Beneficiaries Who Obtained Fertilizer Minikit by the Number of Minikits Received and Size of Land-holding

No. of fertilizer Minikits received	Size of land-holding (ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	No.of beneficiaries					
1	411 (87.45)	350 (79.37)	186 (86.92)	104 (84.55)	13 (86.67)	1064 (84.24)
2	50 (10.64)	81 (18.37)	20 (9.34)	17 (13.82)	2 (13.33)	170 (13.46)
3	8 (1.70)	9 (2.04)	8 (3.74)	2 (1.63)	-	27 (2.14)
4	1 (0.21)	1 (0.22)	-	-	-	2 (0.16)
Total	470 (100.00)	441 (100.00)	214 (100.00)	123 (100.00)	15 (100.00)	1263* (100.00)

(Figures in bracket indicate percentage to the total)

* No response in 24 cases.

As in the case of seed distribution, the Programme had a thrust on initiating marginal and small cultivators with special emphasis on the Scheduled Castes and Scheduled Tribes into better cultivational practices, through free distribution of fertilizer along with the seed. The extent to which this stipulation was observed while implementing the programme can be examined by referring to Tables 3.37 and 3.38.

Table 3.37 : Distribution of Fertilizer Minikit Beneficiaries According to Community and Size of Land-holding

Size of land-holding (Ha.)	Scheduled castes beneficiaries	Scheduled tribes beneficiaries	Other beneficiaries	Total beneficiaries	Per cent beneficiaries
	Number of beneficiaries				
Upto 1	113 (23.35)	17 (3.51)	354 (73.14)	484 (100.00)	37.61
1 - 2	69 (15.47)	20 (4.48)	357 (80.05)	446 (100.00)	34.65
2 - 4	29 (13.49)	4 (1.86)	182 (84.65)	215 (100.00)	16.71
4 - 10	8 (6.45)	3 (2.42)	113 (91.13)	124 (100.00)	9.63
Above 10	-	-	18 (100.00)	18 (100.00)	1.40
Total	219 (17.02)	44 (3.42)	1,024 (79.56)	1,287 (100.00)	100.00

(Figures in brackets indicate percentage to total.)

As observed earlier, the marginal farmers and small farmers together formed 54.30 per cent of the total cultivators in the seven selected districts, according to 1976-77 Agricultural Census. These two categories accounted for about 72 per cent of the sample beneficiaries receiving fertilizer minikits. The Scheduled Castes accounted for 7 per cent among the male cultivators in the seven selected districts and they accounted for 17 per cent of the sample beneficiaries receiving fertilizer minikits. The Scheduled Tribes, however, who accounted for 6.76

per cent of the male cultivators in the seven districts formed only 3.4 per cent of the sample beneficiaries receiving fertilizer minikits. Thus, as in the case of seed minikits the Scheduled Castes received a preferential treatment as stipulated but the Scheduled Tribes were quite neglected.

The communitywise composition of the fertilizer beneficiaries in the seven districts is presented in Table 3.38.

Table 3.38 : Districtwise Distribution of Fertilizer Minikit Beneficiaries According to Community

District	Scheduled Castes beneficiaries	Scheduled Tribes beneficiaries	Other beneficiaries	Total
	Number of beneficiaries			
Ratnagiri	35 (22.29)	-	122 (77.71)	157 (100.00)
Jalgaon	14 (8.81)	10 (6.29)	135 (84.90)	159 (100.00)
Pune	18 (11.84)	2 (1.32)	132 (86.84)	152 (100.00)
Satara	27 (22.31)	-	94 (77.69)	121 (100.00)
Beed	31 (12.50)	10 (4.03)	207 (83.47)	248 (100.00)
Amravati	48 (28.24)	6 (3.53)	116 (68.23)	170 (100.00)
Bhandara	46 (16.43)	16 (5.71)	218 (77.86)	280 (100.00)
Total	219 (17.02)	44 (3.42)	1,024 (79.56)	1,287 (100.00)

(Figures in brackets indicate percentage to the total number of beneficiaries in each district.)

It will be seen from the Table that preferential treatment to Scheduled Caste cultivators was given in all the districts. The Scheduled Tribes were however grossly neglected, both in Amravati and Bhandara districts, where they formed sizable proportions among the male cultivators.

3.11 Prior knowledge and use of fertilizers

As in the case of the seed minikit programme, the fertilizer distribution was intended to help and initiate marginal and small cultivators into new methods of cultivation, using new inputs etc. However, an overwhelming majority (91.53 per cent) reported prior knowledge and use of fertilizer (Table 3.39). Among the marginal and small farmers also, almost all of them (92.11 per cent and 94.32 per cent) reported prior knowledge and use of fertilizer.

Information regarding the type of fertilizer used by the beneficiaries prior to the T and V Programme is presented in Table 3.40.

It may be observed that among the marginal and small cultivators, substantial proportions of the beneficiaries (42.76 per cent and 41.45 per cent respectively) reported use of organic manures alone, while substantial proportions of medium and large farmers (50.47 per cent and 41.67 per cent respectively) reported use of only chemical fertilizers. The rest of the beneficiaries belonging to all the size-classes of land-holding reported use of both the types of fertilizers.

3.12 Type of fertilizer distributed

Three types of fertilizer minikits were distributed to the cultivators. The quantity in each A, C type minikit was adequate for 10 Ha. The composition of the fertilizer minikits is given in Table 3.41.

In Table 3.42, we present information regarding the types of fertilizer minikits obtained by the beneficiaries in all seasons together.

It was reported that even though the requirement of different cereal crops are different, same minikit is given for all the cereal crops as it is not practically feasible to supply

Table 3.39 : Distribution of Fertilizer Minikit Beneficiaries According to Prior Use/Non-Use of Fertilizers and Size of Land-holding

Beneficiaries	Size of land-holding (ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	No. of beneficiaries					
Reporting prior use of fertilizers	432 (92.11)	415 (94.32)	192 (89.72)	106 (86.18)	11 (73.33)	1156 (91.53)
Not reporting prior use of fertilizers	37 (7.89)	25 (5.68)	22 (10.28)	17 (13.82)	4 (26.67)	105 (8.47)
Total	469 (100.00)	440 (100.00)	214 (100.00)	123 (100.00)	15 (100.00)	1261* (100.00)

* No response in 26 cases.
(Figures in bracket indicate percentage to the total)

Table 3.40 : Distribution of Fertilizer Minikit Beneficiaries by Type of Fertilizer Used Prior to Receipt of Fertilizer Minikit

Type of fertilizers used	Size of land-holding (ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	No. of beneficiaries					
Chemicals	60 (14.02)	51 (12.29)	60 (30.00)	54 (50.47)	5 (41.67)	230 (19.79)
Organic	183 (42.76)	172 (41.45)	50 (25.00)	18 (16.82)	2 (16.67)	425 (36.57)
Both	185 (43.22)	192 (46.26)	88 (44.00)	35 (32.71)	5 (41.66)	505 (43.46)
Other type	-	-	2 (1.00)	-	-	2 (0.18)
Total	428 (100.00)	415 (100.00)	200 (100.00)	107 (100.00)	12 (100.00)	1162* (100.00)

(Figures in bracket indicate percentage to the total)

* No response in 125 cases.

Table 3.41 : Composition of Fertilizer Minikits Distributed

Type of fertilizer	Crop	Area (Ha.)	Content	kg.	N (in kg.)	P
A type	Cereals	.10	Urea Di-ammonium phosphate	5 3	2.84	1.38
B type	Rice	.05	"		2.84	1.38
C type	Pulses and oilseeds	.10	Di-ammonium phosphate	6	1.80	2.76

Table 3.42 : Distribution of Fertilizer Minikit Beneficiaries by Type of Fertilizer Received and Size of Land-holding

Type of fertilizer received	Size of land-holding (ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	No.of beneficiaries					
A type	160 (34.04)	155 (35.15)	106 (49.53)	83 (67.48)	6 (40.00)	510 (40.38)
B type	2 (0.43)	1 (0.23)	1 (0.47)	-	-	4 (0.32)
C type	192 (40.85)	159 (36.05)	75 (35.05)	32 (26.02)	8 (53.33)	466 (36.89)
Mixed @	116 (24.68)	126 (28.57)	32 (14.95)	8 (6.50)	1 (6.67)	283 (22.41)
Total	470 (100.00)	441 (100.00)	214 (100.00)	123 (100.00)	15 (100.00)	1263* (100.00)

(Figures in bracket indicate percentage to the total)

@ 283 beneficiaries categorized the minikit as mixed fertilizer.

* No response in 24 cases.

appropriate mix of fertilizer for each crop. Broad classification is therefore adopted in supplying the fertilizer minikit, and there is some divergence between the recommended dose and the fertilizer supplied. For example, for pulses the recommended dose is 25 kg. of N and 50 kg. of P for one hectare* while the minikit provided 18 kg. of N and 28 kg. of P per hectare. Same minikit was to be used for sunflower. However, the requirement of sunflower is 60 kg. of N, 30 kg. of P and 30 kg. of K. For paddy 100 kg. of N and 50 kg. of P is recommended while the minikit provided 56 kg. of N and 28 kg. of P.

There are not any noteworthy differences in the use of fertilizer minikits between the different landholding-size categories. If the seed and fertilizer minikits are considered together, it is noted that paddy seed minikit was accompanied with fertilizer minikit in 60 per cent of the cases. The corresponding proportion was about 40 per cent in the case of jowar, groundnut, tur and safflower and about 30 per cent in the case of sunflower, black gram and green gram. Some differences in the cropwise use of fertilizers are noted among the cultivators with different size of land-holdings; but there is no systematic pattern. (Table 3.43)

If we consider the cropwise distribution of the use of fertilizer minikits it is noted that about 55 per cent of the minikits were used for cereals (27.7 per cent for jowar, 16.7 per cent for rice and 9.6 per cent for bajra); the share of groundnut and sunflower was 9 per cent and 10.6 per cent respectively and that of tur 8.3 per cent. The other pulses like green gram, black gram claimed 2 to 3 per cent of the total. The share of all pulses together was 20.9 per cent.

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* कृषिदर्शनी, १९८६, महात्मा फुले कृषि विद्यापीठ, राहुरी, पृ. ३१-३४.

Cropwise application of fertilizers by size of land-holding is presented in Table 3.43. It will be seen that fertilizer was applied to rice in about 60 per cent of the cases, the corresponding proportion was about 40 per cent in the case of jowar, groundnut, tur safflower and around 30 per cent in the case of green gram, black gram and sunflower. The variations noted between the different land-holding size groups were not systematic.

Table 3.43 : Cropwise Application of Fertilizer by Size of Land-holding

Crop	Size of land-holding (Ha.)					All size groups
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	Per cent cases of fertilizer application					
Jowar	53.36	43.07	31.31	35.11	16.00	40.81
Bajra	10.71	24.28	35.19	28.92	-	22.85
Rice	57.75	74.44	54.29	18.18	-	60.29
Groundnut	54.95	45.78	40.00	14.29	25.00	42.12
Sesamum	23.53	16.67	28.57	-	-	18.60
Sunflower	36.23	36.30	40.98	22.50	9.09	34.81
Safflower	53.85	48.00	25.00	53.85	100.00	43.42
Tur	56.14	45.45	32.56	17.50	18.18	40.23
Green gram	26.09	46.67	26.67	13.04	-	28.13
Black gram	42.86	41.38	45.00	13.79	-	32.17
Gram	53.13	90.62	40.00	78.57	100.00	68.57

As noted earlier three types of fertilizer minikits were distributed. Each crop requires a particular mix of N, P and K and the dose has to be adjusted according to the deficiencies identified through soil testing. Therefore, in reality, the fertilizer mix and dose has to be determined case by case. This could not be practicably done for thousands and thousands of fertilizer minikits distributed all over Maharashtra for a variety of crops. Therefore, some standard mixtures and doses were distributed. Type A minikit was received by most of the fertilizer beneficiaries in Jalgaon district. A large majority in Beed district and a substantial proportion in Ratnagiri and Pune districts obtained C type minikits. The proportion of beneficiaries who reportedly received the 'mixed' type was negligible in all the districts except Amravati and Bhandara where the proportion was 16.5 per cent and 76.68 per cent respectively (Table 3.44). The proportion of families not receiving fertilizer minikit was as high as 58 per cent in Satara district and about 50 per cent in Pune, Jalgaon and Ratnagiri districts. In Beed about 80 per cent of the sample beneficiaries received fertilizer minikit and in Bhandara this proportion was 92 per cent. There are thus large variations in the effective distribution of fertilizers between districts.

If we see the utilization of fertilizer minikits for different crop categories, we see certain discrepancy in the type of fertilizer received and the actual use made by the beneficiaries. For example, in Jalgaon district, almost all the beneficiaries received only A type fertilizer minikit, which was adjusted to cereal crops, but most of them used the fertilizer minikit for all the crop categories (Table 3.45). In Beed, C type of fertilizer minikit was received by 75 per cent of the beneficiaries receiving fertilizer minikit; this was used for all the categories of crops. Thus, many of the beneficiaries

Table 3.44 : Districtwise Distribution of Sample Families by Type of Fertilizer

Type of fertilizer	Ratnagiri	Jalgaon	Pune	Satara	Beed	Amravati	Bhandara
	No. of beneficiaries						
A type	64	143	73	77	57	53	43
Percentage	22.78	47.51	25.09	25.33	18.87	17.95	15.20
B type	-	-	4	-	-	-	-
Percentage	-	-	1.37	-	-	-	-
C type	88	15	71	35	179	77	1
Percentage	31.32	4.98	24.40	11.51	59.27	25.93	0.35
Mixed	-	1	-	13	3	49	217
Percentage	-	0.33	-	4.28	1.00	16.50	76.68
Blank*	129	142	143	179	63	118	22
Percentage	45.91	47.18	49.14	58.88	20.86	39.73	7.77
Total	281	301	291	304	302	297	283
Percentage	100.00	100.00	100.00	100.00	100.00	100.00	100.00

* Fertilizer minikit not received.

Table 3.45 : Percentage Distribution of Fertilizer Minikit Beneficiaries by District and Use of Fertilizer for Different Crops

Fertilizer used for different crops	Ratnagiri	Jalgaon	Pune	Satara	Beed	Amravati	Bhandara
	Per cent beneficiaries						
Cereals	9.61	1.99	7.29	2.32	1.33	8.42	86.52
Oilseeds	0.36	1.00	0.35	-	0.33	3.03	0.71
Pulses	-	-	0.69	-	-	0.34	1.42
Cotton	-	0.33	-	-	-	21.21	-
Other cash crops including vegetables	-	0.66	-	-	-	5.39	-
Pulses and Oilseeds	-	-	-	-	-	1.68	-
All categories	40.57	47.18	18.75	39.40	77.74	15.49	2.48
Not applicable	-	1.66	-	-	-	4.71	-
Blank	49.47	47.18	72.92	58.28	20.60	39.73	8.87
Total	100.00 = 281	100.00 = 301	100.00 = 291	100.00 = 304	100.00 = 302	100.00 = 297	100.00 = 283

Table 3.46 : Districtwise Distribution of Minikit Fertilizer Beneficiaries According to Continued Use of Fertilizer

Use of fertilizer continued	Ratnagiri	Jalgaon	Pune	Satara	Beed	Amravati	Bhandara
	No. of beneficiaries						
Yes	111 (39.50)	157 (52.16)	117 (40.21)	118 (38.82)	219 (72.52)	155 (52.19)	21[illegible] (74.91)
No	19 (6.76)	1 (0.33)	31 (10.65)	9 (2.96)	19 (6.29)	24 (8.08)	42 (14.84)
Blank	151 (53.74)	143 (47.51)	143 (49.14)	177 (58.22)	64 (21.19)	118 (39.73)	29 (10.25)
Total	281	301	291	304	302	297	283

(Figures in brackets indicate percentage to district total.)

had to use the fertilizer minikit obtained for all crop categories irrespective of the composition of the fertilizer minikit received.

It was observed that while 1287 beneficiaries received fertilizer minikits, only 177 beneficiaries received minikits in the second year and only 18 beneficiaries received the fertilizer minikit in the third year. Even then, it may be observed that of the 1232 fertilizer beneficiaries responding to the query whether they continued to use fertilizer, 88.39 per cent reported continued use of fertilizer. Among those who did not continue the use of fertilizer, the marginal and small farmers were somewhat larger in proportion (Tables 3.46 and 3.47).

3.13 Continued use of fertilizers

Of those who continued the use of fertilizer, almost all (98.36 per cent) had obtained fertilizer from the market (Table 3.48).

Only a few did not continue to use fertilizer and the major reason in all districts was the lack of resources with the beneficiaries. A few beneficiaries reported that they did not continue to use fertilizer because of inadequate rainfall (Table 3.49 and 3.50).

3.14 Profitability of Minikit scheme

In the schedule the beneficiaries were asked whether the use of fertilizer minikit resulted in an increase in the yield. Almost 90 per cent of the respondents said 'Yes' and there was not much difference in their response between the different land-holding classes (Table 3.51).

Almost all the fertilizer beneficiaries in Ratnagiri, Jalgaon and Beed districts and very large majority of fertilizer beneficiaries in Pune, Satara, Amravati and Bhandara districts reported increase in the yield (Table 3.52). Only a few beneficiaries reported that they did not experience any increase in the yield.

Table 3.47 : Distribution of Fertilizer Minikit Beneficiaries According to Continued Use of Fertilizer and Size of Land-holding

Continued use of fertilizer	Size of land-holding (ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	No. of beneficiaries					
Yes	375	384	202	114	14	1089
Percentage	83.89	88.68	94.39	92.68	93.33	88.39
No	72	49	12	9	1	143
Percentage	16.11	11.32	5.61	7.32	6.67	11.61
Total	447	433	214	123	15	1232*
	100.00	100.00	100.00	100.00	100.00	100.00

* No response in 55 cases.

Table 3.48 : Distribution of Fertilizer Minikit Beneficiaries According to Source for Continued Use of Fertilizer and Size of Land-holding

Sources for continued use of fertilizer	Size of land-holding (ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	No.of beneficiaries					
1.Purchase	352	372	190	112	13	1039
Percentage	94.88	96.88	93.14	94.12	92.86	95.15
2.Obtained fertilizer minikit again	4	5	4	4	0	17
Percentage	1.08	1.30	1.96	3.36	-	1.55
3.1+2	15	7	9	3	1	35
Percentage	4.04	1.82	4.41	2.52	7.14	3.21
4.Obtained under subsidy under some scheme	0	0	1	0	0	1
Percentage	-	-	0.49	-	-	0.09
Total	371	384	204	119	14	1092*
	100.00	100.00	100.00	100.00	100.00	100.00

* No response in 195 cases.

Table 3.49 : Distribution of Fertilizer Minikit Beneficiaries According to Reasons for Not Using Fertilizer and Size of Land-holding

Reasons for not using fertilizer	Size of land-holding (ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	No. of beneficiaries					
Economic problem	44 (64.71)	34 (75.56)	8 (66.67)	7 (100.00)	1 (50.00)	94 (70.15)
Inadequate rainfall	3 (4.41)	6 (13.33)	3 (25.00)	-	1 (50.00)	13 (9.70)
Organic fertilizer available	21 (30.88)	5 (11.11)	1 (8.33)	-	-	27 (20.15)
Total	68 (100.00)	45 (100.00)	12 (100.00)	7 (100.00)	2 (100.00)	134 (100.00)

(Figures in the bracket indicate percentages)

Table 3.50 : Districtwise Distribution of Fertilizer Minikit Beneficiaries According to Reasons for Not Using Fertilizer

District	Reasons for not using fertilizers			Total
	Economic problem	Less rainfall	Organic fertilizer available	
Ratnagiri	16 (94.12)	1 (5.88)	-	17 (100.00)
Jalgaon	1 (100.00)	-	-	1 (100.00)
Pune	19 (73.08)	4 (15.38)	3 (11.54)	26 (100.00)
Satara	6 (66.67)	3 (33.33)	-	9 (100.00)
Beed	-	1 (4.35)	22 (95.65)	23 (100.00)
Amrafati	24 (88.89)	2 (7.41)	1 (3.70)	27 (100.00)
Bhandara	28 (90.32)	2 (6.45)	1 (3.23)	31 (100.00)
Total	94 (70.15)	13 (9.70)	27 (20.15)	134 (100.00)

(Figures in the bracket indicate percentages)

Table 3.51 : Distribution of Fertilizer Minikits Beneficiaries According to Their Experience Regarding Yield

Experienced increase in the yield	Size of land-holding (ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	No. of beneficiaries					
Yes	419	380	187	112	11	1109
Percentage	90.89	86.76	87.38	91.06	73.33	88.65
No	40	58	27	11	4	140
Percentage	8.68	13.24	12.62	8.94	26.67	11.19
Cannot tell	2	-	-	-	-	2
Percentage	0.43					0.16
Total	461	438	214	123	15	1251*
	100.00	100.00	100.00	100.00	100.00	100.00

* No response in 36 cases.

Table 3.52: Districtwise Distribution of Fertilizer Minikit Beneficiaries According to Their Experience Regarding Yield of Improved Varieties

District	Experienced increase in the yield				Total	Percentage
	Yes	Percentage	No	Percentage		
Ratnagiri	138	98.57	2	1.43	140	100.00
Jalgaon	153	97.45	4	2.55	157	100.00
Pune	130	89.04	16	10.96	146	100.00
Satara	107	84.25	20	15.75	127	100.00
Beed	229	96.22	9	3.78	238	100.00
Amravati	139	78.09	39	21.91	178	100.00
Bhandara	213	80.99	50	19.01	263	100.00
Total	1109	88.79	140	11.21	1249*	100.00

* No response in 38 cases.

The above response is not based on any data or records of yields but it is the reaction of the beneficiaries. That almost all the respondents gave a positive answer seems natural as they would be obviously interested in the continuation of a scheme in which they receive fertilizer minikits free of cost. Similar was the response to the query regarding the profitability of seed minikit (Table 3.53).

Eighty to ninety per cent of the beneficiaries reported that the new varieties of most of the crops were profitable. The favourable response was not so overwhelming in the case of sunflower and tur and black gram. If we compare the responses of the beneficiaries between different size classes of land-holdings, it is noted that while cultivators from all categories were more or less equally enthusiastic about cereal crops, the large farmers had some reservations about oilseeds particularly sunflower, and tur.

Districtwise distribution of the beneficiaries according to whether they found the new varieties of crops profitable is presented in Table 3.54.

It may be observed that in Amravati district, large failures were reported in respect of sunflower and pulses. Sunflower was reported to be a failure by 25 out of 32 beneficiaries in Bhandara district, by nearly all the respondents in Ratnagiri district, and in Jalgaon district about half the beneficiaries did not consider sunflower as a profitable crop. In Pune district, the response was not overwhelmingly positive for jowar, paddy and sunflower. Barring these cases nearly all the beneficiaries reported that the new varieties were profitable.

The reasons why the respondents felt that the new varieties are profitable were noted. The predominant reason reported for all the crops was that the yields are higher. The reason why the new varieties were not found profitable was given by 463 respondents. About 88 per cent of these said that the yield was relatively low. The other reasons mentioned by a few were higher cultivation costs, poor germination rate, relatively lower prices fetched by the hybrid varieties.

Table 3.53: Percentage of Seed Minikits of Different Crops Reported as Profitable by Size of Land-holding

Size of land holding (Ha.)	Crop	Total Reporting	Percent Reporting S.M.* as Profitable
Upto 1	Jowar	221	86.43
	Bajra	168	95.83
	Rice	213	89.67
	Groundnut	91	93.41
	Sunflower	137	75.91
	Tur	57	82.47
	Black gram	28	67.86
	Gram	32	75.00
1 - 2	Jowar	267	87.27
	Bajra	172	89.54
	Rice	90	77.78
	Groundnut	83	86.75
	Sunflower	135	78.52
	Tur	110	83.64
	Black gram	29	55.17
	Gram	26	88.46
2 - 4	Jowar	214	85.51
	Bajra	108	90.74
	Rice	35	74.29
	Groundnut	45	95.56
	Sunflower	60	51.67
	Tur	41	63.41
	Black gram	20	75.00
	Gram	30	80.00
4 - 10	Jowar	129	90.70
	Bajra	81	95.06
	Rice	11	90.91
	Groundnut	42	88.10
	Sunflower	36	52.78
	Tur	39	71.79
	Black gram	29	79.31
	Gram	13	92.31
Above 10	Jowar	25	84.00
	Bajra	2	100.00
	Rice	1	neg.
	Groundnut	12	75.00
	Sunflower	11	63.64
	Tur	11	54.55
	Black gram	9	88.89
	Gram	3	100.00
Total	Jowar	856	87.03
	Bajra	531	92.66
	Rice	350	84.86
	Groundnut	273	90.11
	Sunflower	379	70.45
	Tur	258	78.68
	Black gram	115	70.43
	Gram	104	82.69

* S.M. = Seed Minikit of improved varieties.

Table 3.54: Districtwise Percentage of Seed Minikits of Different Crops Reported as Profitable

District	Crop	Total Reporting	Per cent Reporting S.M.* as profitable
Ratnagiri	Rice	178	91.01
	Groundnut	84	90.48
	Sunflower	22	13.64
	Tur	7	28.57
Jalgaon	Jowar	172	95.35
	Groundnut	43	95.35
	Sunflower	26	50.00
	Tur	18	94.44
Pune	Jowar	130	66.15
	Rice	23	65.22
	Groundnut	55	94.55
	Sunflower	56	62.50
	Tur	16	68.75
Satara	Jowar	195	84.10
	Groundnut	21	95.24
	Sunflower	18	77.78
	Tur	22	90.91
Beed	Jowar	205	99.51
	Groundnut	18	100.00
	Sunflower	187	100.00
	Tur	64	98.44
Amravati	Jowar	136	83.82
	Groundnut	40	70.00
	Sunflower	38	21.05
	Tur	78	53.85
Bhandara	Jowar	18	72.22
	Rice	148	80.41
	Groundnut	12	91.67
	Sunflower	32	21.88
	Tur	53	90.57

* S.M. = Seed Minikit of improved varieties.

Table 3.55: Distribution of Seed Minikits Found Non-Profitable According to Reasons for Crop Failure

Crop	Reasons for Crop Failure					
	Birds and Animals	Less Rain	Excess Rain	Pests and Diseases	Total	Percent
	Percent minikits					
Jowar	5.00	61.67	6.67	3.34	100=60	6.98
Bajra	17.64	41.17	5.89	17.65	100=17	3.18
Rice	8.51	53.19	10.64	12.77	100=47	13.43
Groundnut	75.00	6.25	6.25	-	100=16	5.86
Sesamum	15.38	53.84	23.08	7.69	100=13	30.23
Sunflower	51.89	29.11	7.59	6.32	100=79	20.52
Safflower	15.00	50.00	-	15.00	100=20	26.32
Tur	6.25	59.38	3.12	12.50	100=32	12.26
Green gram	26.67	60.00	13.33	-	100=15	15.63
Black gram	38.09	28.57	33.33	-	100=24	20.87
Chavali	50.00	-	-	50.00	100= 4	50.00
Gram	33.33	41.67	8.33	8.33	100=12	11.42
Kulith	100.00	-	-	-	100= 2	13.33
Total	90	149	31	27	341	100.00
Percent	26.39	43.70	9.09	7.92	100.00	

Table 3.56 : Districtwise Distribution of Seed Minikits Found Not Profitable According to Reasons for Failure

District	Crop	Reasons for crop failure						Total	Per cent affected
		Birds and animals	Less rain	Excess rain	Pests and diseases	Other reasons	Total affected		
		Number of minikits							
Ratnagiri	Rice	3	-	1	2	3	9	178	5.06
	Sunflower	14	1	4	-	-	19	84	22.62
	Groundnut	10	-	-	-	-	10	22	45.45
	Tur	2	-	1	2	-	5	7	71.43
Jalgaon	Jowar	-	4	-	-	1	5	172	2.91
	Sunflower	-	1	-	-	-	1	26	3.85
Pune	Jowar	2	18	3	-	4	27	130	20.77
	Rice	-	-	3	-	4	7	23	30.43
	Sunflower	5	1	2	-	2	10	56	17.86
	Groundnut	1	-	1	-	1	3	55	5.45
	Tur	-	4	-	-	1	5	16	31.25
Satara	Jowar	-	6	1	-	9	16	195	8.21
	Sunflower	1	2	-	-	-	3	18	16.67
	Tur	-	1	-	-	-	1	22	4.55
Amravati	Jowar	1	5	-	1	-	7	136	5.15
	Sunflower	15	2	-	2	2	21	38	55.26
	Groundnut	1	1	-	-	1	3	40	7.50
	Gram	-	12	-	1	4	17	78	21.79
Bhandara	Jowar	-	4	-	1	-	5	18	27.78
	Rice	1	25	1	4	-	31	148	20.95
	Sunflower	6	16	-	3	-	25	32	78.13
	Tur	-	2	-	1	1	4	53	7.55

Crop failure in over twenty per cent of the minikits was noted in the cases of sunflower, safflower, sesamum and black gram and it was between 10 to 15 per cent in the case of paddy, green gram, gram, kulith and tur. Cases where failure of seed minikit was reported were specially examined. It was found that in 149 cases out of 341 cases of crop failure inadequate rain was the main reason. Birds menace was reported to be the main cause for the poor performance of sunflower. Excess rains and pests caused failure respectively in 9 per cent and 8 per cent of the total cases.

In Bhandara district paddy was affected by inadequacy of rains, this was the main cause for failure of jowar in Pune district and of gram in Amravati district. Bird menace affected sunflower in all the districts except Beed, and Jalgaon. Groundnut was adversely affected due to bird and animal menace in Ratnagiri district (Table 3.56).

3.15 Productivity of New Seeds

So far we have considered the general response of the beneficiaries about the profitability of the new varieties. Attempt at quantitative estimation was also made by requesting the respondent to give yield data in relation to the new varieties sown. However, as noted earlier, it was difficult for the respondents to recall in 1986 the figures of yield for the three previous years as no records are maintained by the farmers. In a large number of cases they may not even know the exact yield of the plot sown with minikit seed as the crop was usually not harvested and weighed separately. At times, the minikit seed was not even sown in a separately marked area. Unless the area is demarcated and the crop yield specially measured it is not possible to get at an accurate figure of the yield. This was, however, not possible in the present survey. We had, therefore, to depend only on the reporting by the beneficiaries. Under the circumstances the reported figures reflect the guestimate made by the respondent. There would be a general tendency to report higher yields as the minikits were distributed free. The

information presented below has to be used keeping in view the above limitations.

The average yield per hectare for the selected districts and the reported yield by the beneficiaries, for the three year period (1982-83, 1983-84 and 1984-85) for various crops are presented in Tables 3.57 and 3.58.

Jowar is the major crop in Maharashtra and also accounted for about one-third of the total seed minikits distributed to the beneficiaries surveyed. It may be observed that in all the jowar growing districts the yields obtained by the beneficiaries were higher than the district average. In the case of bajra, which accounted for around one-fifth of the total minikits distributed to the beneficiaries surveyed, the yields obtained by the beneficiaries were lower as compared with the district average for Amravati district and considerably higher in Jalgaon, Pune and Satara districts. In the case of rice, which accounted for a little over five per cent of the total minikits distributed, the yields obtained by the beneficiaries for the two rice-growing districts, viz., Bhandara and Ratnagiri were higher than their respective district level yields.

Among the oilseeds, sunflower accounting for over a tenth of the total minikits distributed was a new crop which the T and V Programme was designed to popularize. The yields obtained by the beneficiaries for this crop were comparable with the district average. Safflower and groundnut are the two traditional oilseeds grown in Maharashtra and together accounted for around a tenth of the total minikits distributed.

The yield per hectare for groundnut in the seven districts and for the beneficiaries are somewhat difficult to compare as the proportions of area under kharif and summer groundnut cultivation are different in different districts. So also, summer groundnut, being an irrigated crop, yields much higher production than the rainfed groundnut crop. Therefore we worked out

Table 3.57 : Districtwise productivity of Major Crops (1982-83 to 1984-85) for the entire district

Crop	Ratna-giri	Jalgaon	Pune	Satara	Beed	Amra-vati	Bhan-dara
	Average yield in kg. per hectare						
Rice	1921	1568	1461	1727	770	566	1040
Wheat	-	1050	1154	1230	642	884	622
Jowar	-	1183	480	930	556	1247	532
Bajra	-	568	403	259	425	373	-
Tur	-	741	620	644	509	737	570
Gram	-	573	506	446	331	426	423
Groundnut	1561	722	1212	1451	688	760	837
Safflower	-	512	523	541	862	429	-
Sunflower	-	440	446	448	423	500	-

Source: Districtwise General Statistical Information of Agricultural Department (1985-86), Part II.

Table 3.58 : Districtwise Yield of Major Crops Reported by the Beneficiaries of Seed Minikit (1982-83 to 1984-85)

Crop	Ratna-giri	Jalgaon	Pune	Satara	Beed	Amra-vati	Bhan-dara
	Average yield in kg. per hectare						
Rice	3208	-	2122	-	-	-	1299
Jowar	-	1741	1032	1640	1247	1475	383
Bajra	-	1756	1482	1027	519	333	-
Tur	-	726	417	783	509	541	430
Gram	447	899	610	588	368	721	368
Green Gram	580	558	319	412	501	662	376
Black gram	558	585	-	316	474	356	-
Groundnut	1354	1675	1057	971	736	655	778
Sesamum	-	568	361	-	-	-	291
Sunflower	-	716	415	679	474	472	232
Safflower	-	753	309	689	437	-	331

the annual average yield for each district which is a weighted average for kharif and summer crop, weights being the area under groundnut in these districts in the two seasons. If we compare the two sets of figures we find that for five districts the yields reported by the beneficiaries are lower as compared to the district averages.

In the case of safflower, yields obtained by the beneficiaries in Jalgaon and Satara were higher than the district average while they were considerably lower than the district average in Pune and Beed districts.

It would be instructive to see the yields obtained by the cultivators with different size class holdings of land for different crops. This information is presented in Table 3.59.

Table 3.59 : Yield Reported by the Beneficiaries of Seed Minikit (1982-83 to 1985-86) by Size of Land-holding

Crop	Size of land-holding (Ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	Average yield in kg. per hectare					
Jowar	1184	1406	1510	1847	1610	1428
Bajra	715	927	1411	1611	500	1056
Rice	2216	1944	2041	3106	-	2119
Groundnut	1156	1033	1233	1409	865	1142
Sunflower	487	507	507	619	490	503
Safflower	485	336	740	601	1250	541
Tur	472	548	503	698	516	538
Green gram	449	420	640	635	1533	552
Black gram	475	513	517	536	635	518
Gram	498	371	547	894	717	530

It may be observed that in the case of major cereal crops like Jowar and rice the yields have been more or less comparable between the different size classes of land-holders. In the case of oilseed, the medium cultivators experienced somewhat better

yields and large farmers had better yields for safflower, but there is no consistent pattern. In the case of pulses, however, the large and medium farmers consistently had higher yields than that experienced by the marginal and small farmers.

The average yield of major crops as recorded in the investigations carried out by the Department of Agriculture through VEWs who noted down the yield as reported by the sample farmers is given in Table 3.60 for the seven selected district. There are large variations in the yield from district to district, the yield of bajra ranging from 390 kg/ha in Beed district to 1700 kg/ha in Jalgaon district or for sunflower from 80 kg/ha in Ratnagiri district to 943 kg/ha in Satara district. There are considerable year to year fluctuations as well, even in the assured rainfall tracts. The average yields for the State as a whole are compared with the reported yields under the minikit programme (Table 3.61). It will be noted that there is a marked difference in the productivity figures only in the case of cereals where a definite break-through has been made through the development of hybrid and High Yielding Varieties. The reported yield under the minikit programme is higher by about 50 per cent in the case of jowar and rice and more than twice in the case of bajra. It must be noted that Hybrid and HY Varieties are established and accepted in the case of cereals. The thrust of the minikit programme is however on pulses and oilseeds where no marked improvement is reported under the minikit scheme. In that case, what is the role of the massive effort launched through the minikit distribution programme?

3.16 Evaluation of Minikit Programme

The minikits scheme for popularizing improved varieties of seed together with fertilizer, particularly among the marginal and small farmers, is one of the very ambitious schemes of the Department of Agriculture and covers a very large number of cultivators throughout Maharashtra.

Table 3.60 : Districtwise Average Yield of Major Crops as Noted in Seed Minikit Evaluation Study by the Directorate of Agriculture

Crop	Ratna-giri	Jalgaon	Pune	Satara	Beed	Amra-vati	Bhan-dara
	Average yield in kg. per hectare						
(A) 1983-84							
Kharif Season							
Jowar	-	2115	1069	1610	1375	1337	-
Bajra	-	1700	1080	1057	390	650	-
Rice	3373	-	2641	1731	-	-	2183
Groundnut	210	1301	830	1784	1167	1194	-
Sunflower	80	644	485	943	324	357	134
Sesamum	226	256	411	200	62	42	240
Tur	-	1100	622	-	150	900	507
Green gram	1320	343	391	599	399	505	-
Black gram	534	323	-	747	247	292	164
Rabi Season							
Jowar	-	1316	1350	1071	911	-	672
Wheat	-	1410	-	1564	-	-	357
Sunflower	482	602	585	427	657	362	388
Safflower	-	-	564	618	304	398	236
Groundnut	1639	-	-	-	-	-	-
Sesamum	66	-	-	-	-	-	-
Tur	-	-	-	-	-	-	919
Gram	338	715	655	594	573	569	492
Green gram	416	-	-	-	-	-	320
Kulith	445	-	-	-	-	-	-
Wal	385	-	-	-	-	-	-
Chavali	466	890	-	-	-	-	-

(continued)

Table 3.60 : (continued)

Crop	Ratna-giri	Jalgaon	Pune	Satara	Beed	Amra-vati	Bhan-dara
	Average yield in kg. per hectare						
(B) 1984-85							
Kharif Season							
Jowar	-	1934	-	2289	-	1184	-
Bajra	-	1229	1109	529	-	322	-
Rice	3329	-	-	2096	-	-	771
Groundnut	1123	1129	1339	1393	-	718	250
Sunflower	-	641	761	466	-	-	-
Soyabean	-	-	-	-	-	510	-
Sesamum	190	113	200	535	-	-	90
Tur	-	705	-	533	-	599	506
Green gram	-	306	-	387	-	200	-
Black gram	-	421	-	514	-	239	110
Rabi Season							
Jowar	-	-	1725	1561	-	-	-
Wheat	-	-	2083	1424	-	880	-
Sunflower	-	-	793	520	-	397	-
Safflower	-	-	775	493	-	450	-
Groundnut	-	-	-	-	-	-	-
Tur	-	-	880	-	-	577	-
Gram	-	645	906	531	-	631	-

(continued)

Table 3.60 : (continued)

Crop	Ratna-giri	Jalgaon	Pune	Satara	Beed	Amra-vati	Bhan-dara
	Average yield in kg per hectare						
(C) 1985-86							
Kharif Season							
Jowar	-	700	694	1186	793	1533	-
Bajra	-	540	712	736	1036	493	-
Rice	2950	-	-	1440	1600	-	1620
Nachani	960	-	-	397	-	-	-
Groundnut	-	468	834	1079	882	898	1075
Sunflower	-	343	699	606	1233	406	238
Soyabean	-	-	167	-	290	-	-
Sesamum	-	-	300	-	-	260	-
Tur	-	277	433	346	580	681	458
Green gram	-	364	330	350	192	618	-
Black gram	-	-	265	140	250	473	-
Rabi Season							
Jowar	-	-	1024	961	-	-	442
Wheat	-	-	1390	812	-	-	-
Sunflower	-	-	741	342	-	-	160
Safflower	-	-	495	367	-	-	182
Tur	-	-	110	-	-	339	-
Gram	-	-	635	625	-	623	-

Source : Mimeographed Note by Directorate of Agriculture, Maharashtra State, for the years 1983-84, 1984-85, 1985-86.

Table 3.61 : Average Yields of Major Crops Under Seed Minikit Programme and for Total Maharashtra

	Seed Minikit Programme			Maharashtra State ***
	Present Study* Average for seven selected disctricts	Study by Directorate of Agriculture **		
		Seven selected districts	Maharashtra State	
	(1)	(2)	(3)	(4)
	Average yield in kg per hectare			
Kharif				
Jowar	1428	1428	1594	1073
Bajra	1056	825	987	381
Rice	2119	2150	2564	1401
Nachani	826	679	757	N.A.
Groundnut	1142	982	1115	818
Sunflower	503	545	469	467
Soyabeam	73	370	410	N.A.
Sesamum	432	237	234	N.A.
Niger	250	N.A.	N.A.	N.A.
Tur	538	568	603	631
Green gram	552	421	352	N.A.
Black gram	518	329	323	N.A.
Rabi				
Jowar	@	1172	1092	435
Wheat	1312	1224	1480	872
Groundnut	@	1639	1179	1396
Sunflower	@	495	440	559
Safflower	541	448	434	587
Sesamum	@	66	125	N.A.
Linseed	541	N.A.	N.A.	N.A.
Tur	@	624	587	N.A.
Gram	530	623	597	388
Green gram	@	368	393	N.A.
Kulith	624	445	348	N.A.
Wal	-	385	608	N.A.
Black gram	-	N.A.	349	N.A.
Chavali	256	678	572	N.A.
Pea	-	-	392	N.A.
Masoor	425	N.A.	N.A.	N.A.

* Average for the years 1982-83 to 1984-85.
** Average for the years 1983-84 to 1985-86.
*** Average for the years 1982-83 to 1984-85.
@ Average for both seasons shown against kharif column.
N.A. - Not available.

Source: Cols.2 & 3: Mimeographed Note prepared by Directorate of Agriculture, Maharashtra State for the years 1983-84, 1984-85 and 1985-86.
Column 4 : Districtwise General Statistical Information of Agricultural Department (1985-86) Part II - Epitome of Agriculture in Maharashtra.

The survey results as analysed above have to be combined with the field observations made during our discussions with the officials of the Government, the elected officials at the local level, the VEWs and the beneficiaries themselves in order to draw a realistic conclusion. This becomes all the more necessary when the primary data are collected through personal interview on the basis of a schedule the replies to which are likely to be affected because of the tendency on the part of the respondents to give the positive side of the scheme with a hope to draw continued benefits from the scheme.

It is a fact that the programme has become popular and although increasing number of minikits are being supplied year after year, they are in short-supply. One reason for this popularity seems to be that many of the varieties distributed as new improved seeds were already established and accepted varieties. For example, CSH-1 variety of jowar had been released in 1964, CSH-5 in 1974 and CSH-6 and CSH-9 in 1977. In the case of rice Jaya variety was released in 1968 and Ratna in 1970. Hence the cultivators saw in the scheme a good opportunity to get, free of cost, at least some seed which they would, any way, use on their farms. The field observations indicated that in many villages from Jalgaon, Beed, Amravati districts,the local varieties of jowar were almost absent and the varieties like CSH-1, CSH-5, CSH-6, CSH-9, distributed in the minikits programme were already established and accepted varieties. So also, the improved varieties of paddy like Jaya and Ratna have been promoted long ago and are now well established and accepted in Ratnagiri district. In the case of groundnut also, the farmers already knew the high productivity of the JL-24 variety released in the year 1979.

The bureaucratic machinery, in fact, created problems in a different way. Since the thrust of the programme was on the promotion of oilseeds and pulses, oilseed minikits were distributed in all districts irrespective of whether such distribution

actually helped the farmer. In Ratnagiri district, for example, groundnut can be taken only as a summer crop by those who have access to irrigation. The target-oriented distribution machinery, however, supplied groundnut seed to Ratnagiri farmers who without access to irrigation, could not benefit from the seed. However, if they received groundnut minikit they missed the opportunity of receiving the seed they wanted, since the stipulation was to give only one minikit per farmer. Some farmers from Ratnagiri district complained that they did not get enough of paddy seed minikits or pulses like kulith developed by the Dapoli Krishi Vidyapeeth. In Ratnagiri district certain varieties of paddy seed distributed mature before the monsoon is over and hence both the crop and the straw reportedly got spoiled by the rain. In Satara the farmers easily accepted CSH-8R jowar as they knew of the high yield but they did not get enough minikits of this variety. It was noted in one of the surveyed villages from Satara district that the local dealer insisted that farmers could not buy CSH-8R unless they also bought some CSH-5 which they did not want. In Amravati district, safflower minikits were distributed. But because of the low yield, safflower is not popular in Amravati district. What they really wanted was minikits of gram and wheat which they did not get in enough numbers. In the case of summer groundnut it was reported that fresh seed has to be sown and not the one kept from the previous crop to get good results. The minikit programme, however, expected the farmers to use the previous crop as seed. Many farmers also suggested that minikits for vegetable crops should be distributed, particularly, for the kharif season. Sunflower grows well but a lot of farmers complained that birds are a nuisance to this crop and protection from birds is not possible. Local conditions have, therefore, to be examined carefully instead of taking a target-oriented approach in the distribution of minikits.

Another observation was regarding the delay in the distribution of minikits which delayed the sowing and affected the yield

of these varieties. The VEWs themselves received their supplies late more than half the time. The transport of minikits is the responsibility of the Zilla Parishad and Panchayat Samitis who do not often manage to deliver the minikits well in advance. The VEWs had to carry the minikits from their headquarters to the points of distribution on a bicycle. About 42 percent VEWs had to cover five to nine villages and about 17 percent had to cover more than nine villages. At this rate of coverage by each VEW, delays seem inevitable. But the fact remained that the farmers did not get minikits on time and the sowing was often delayed which must have adversely affected the programme.

Many farmers felt that the quantity of seed given was inadequate for the .10 ha on which it was supposed to be sown. In the case of paddy, 2.5 kg seed minikit was given for .10 ha. The currently adopted seed rate was observed to be 5 kg for .10 ha. Besides, it was reported from one village in Ratnagiri district that the minikit contained quite some chaff along with the seed with the effect that the minikit was considered adequate only for .04 ha by the farmers. The recommended seed rate was not, thus, maintained by the farmers. This requires more attention by the existing agencies as it relates to the extension programme for improved cultivation practices for improved seed. The recommended seed rate is based on a much thinner plant population than traditionally accepted by the farmer and the VEWs could not convince the farmers of the need to keep the plant population low for a better yield from the new varieties. The complaint that the farmers did not receive adequate guidance from the VEWs or contact farmers was quite widespread. In one village from Pune district, there were complaints against the theft of groundnut seed. Some also complained that they were charged some money for the minikit. Some marginal farmers complained that they were told that the supplies were over when their turn came.

The farmers in Pune, Jalgaon, Amravati, Beed and Satara

districts suggested also that the minikit should be adequate at least for one acre. Even if the farmers maintained the seed rate as recommended by the VEW and used the minikit for.10 ha, it was felt that .10 ha is too small an area either for taking special cultivational measures or for noting the yield difference. Farmers, at times, mixed the improved seed along with the other seed and used it. This, not only did affect the yield of the crop, but certainly made it impossible for the farmers to say anything positively about the profitability of using the improved seed distributed through the minikit distribution programme.

Less use or non-use of fertilizer was another problem. Fertilizer minikits were also to be distributed along with the seed minikit. It was our observation that in most of the talukas of the selected districts not all seed minikits were accompanied by fertilizer minikits. Wherever farmers got the fertilizer, the farmers in Pachora Taluka for example, pointed out that the quantity was inadequate for the improved varieties. The farmers were expected to buy fertilizer in addition to the basal dose provided which they often did not because of lack of resources.

All this would affect the fruitfulness of the programme. Even then, in the survey of the beneficiaries, a vast majority replied that the programme 'proved' to be profitable. The responses of the farmers, particularly regarding the productivity, have to be accepted with caution. Firstly, they did not sow the seed on the stipulated area; secondly some used mixed seed and not the pure one distributed in the minikit; and thirdly, they had kept no record of the actual production on that specific plot of land for the last three years for which the question was asked in our schedule.

Many farmers did not get proper and timely guidance about sowing, interculture or noting the results of the experiment done on their farm. It was observed and reported by village officials and also the beneficiaries that majority of the VEWs merely

distributed the minikits. Of course, the VEWs have their own difficulties. Many of them, as we have noted, had a large number of villages and beneficiaries to attend to and it may not have been very easy for them to guide so many. But we must also mention here that many VEWs kept the taluka place as their headquarter and went into the interior when they had to i.e. for distribution of minikits. Besides, it was observed that adequate thought was not given in the postings of the VEWs. It was observed that in Konkan, for example, VEWs from Ahmednagar and Buldhana districts were appointed. These VEWs were not familiar with the crops grown in Konkan. Moreover, they were not interested in staying in Konkan and were waiting for transfer to their home districts.

The minikit distribution programme like many other Government Programmes is a target-oriented programme and suffers, in implementation, from the same drawbacks as experienced in the other similar programmes. The operation becomes a marathon operation and the selection of staff also an equally marathon task. Not much time and effort can be spent in the orientation of the staff. The scheme becomes very expensive and, therefore, the staff is inadequate and required to do lot of work as compared either to training or to the returns. Both in the selection of the beneficiaries, and guidance to the selected beneficiaries quality becomes the first victim. That is also the experience in the minikit distribution programme.

When all is said and done, even according to the conception and the aim of the programme, seed and fertilizer are only some inputs for increasing crop productivity. Many farmers, particularly the small and marginal, do not have complementary inputs like basic agricultural implements such as plough or bullocks or financial resources to buy pesticides, additional fertilizer, etc. Besides, many marginal farmers own inferior lands. This is more so, particularly in the case of lands redistributed through the enforcement of the Land Ceiling Act. Some of the marginal

farmers, in the informal discussions with the field investigators, indicated that they cannot make effective use of seed or fertilizer minikits since they owned inferior pieces of land. Yet since seed and fertilizers were being distributed free of charge they accepted the minikits.

The scheme of minikit distribution involved considerable expenditure. The cost of material inputs viz. seed minikits and fertilizer minikits distributed during the period 1982-83 to 1985-86 came to Rs. 8.3 crore and Rs. 8.1 crore respectively. The distribution was effected through the Training and Visit Programme machinery. Six thousand Village Extension Workers, 747 Agricultural Officers, 180 Subject Matter Specialists, 90 Sub-Divisional Agricultural Officers, 29 Principal Agricultural Officers, Joint Directors of Agriculture work under Additional Director of Agriculture for the implementation of the T & V Programme. Seed and fertilizer minikit distribution and guidance to the farmers is a major activity taken up under the T & V programme. The cost of the extension machinery set up for the T & V programme is quite considerable. The salary component of the T & V programme personnel comes to about Rs.10 crore per year.

The benefit of the programme is reflected in the net additional crop production due to the use of seed and fertilizer minikits distributed and the guidance received under the T & V programme. The reported yields noted in the survey were compared with the overall district level averages. It was noted that the yields were significantly higher in the case of jowar, bajra, rice and gram. The reported yields were somewhat lower in the case of safflower and tur and about the same as the overall average in the case of groundnut and sunflower. The estimated net additional benefit* due to the increase in yield worked to about Rs. 12 crore for the four year period — 1982-83 to 1985-86.

The estimates of the benefit were based on reported figures of additional production by the respondent beneficiaries. Taking into account the fact that most beneficiaries were a little too

* net of normal cultivation costs; Scheme expenses are not considered.

optimistic in reporting (than in private/informal talk) one can assume that the estimates of the benefit are quite liberal and likely to be on the higher side.

The benefits of the scheme are thus obviously not commensurate with the huge costs involved. In addition the small and marginal farmers are not by and large in a position to stay on with the improved varieties if there is no free distribution, thus there seems to be little long-term benefit. In view of these facts it is considered necessary to have a fresh look at these programmes and work out alternatives so as to achieve long-term impact on agricultural production and productivity of the weaker sections.

CHAPTER IV

MONITORING OF MINIKIT SCHEME

Monitoring of Minikit Schemes (seed and fertilizer) was carried out with respect to the distribution of minikits both in kharif and in rabi seasons of the year 1985-86. For kharif Monitoring 150 beneficiaries per district, distributed equally between the two selected talukas were surveyed. Similarly for rabi Monitoring, 150 beneficiaries per district (75 each per selected taluka) were surveyed. List of the villages from the seven districts covered in the kharif season is given in Table 4.1 and those in rabi season in Table 4.2. In the present chapter the results of kharif Monitoring survey based on 1,057 schedules and rabi Monitoring survey based on 1,047 schedules are presented.

Table 4.1 : List of Villages Included in Monitoring Study of Seed and Fertilizer Minikit Distribution Scheme in Kharif Season (1985-86)

Name of Division and District	Taluka	Selected Villages
I. KONKAN		
Ratnagiri District	1) Chiplun	(1) Kapare (2) Khershet (3) Miraone (4) Mundhe (5) Nandgaon (6) Pathardi (7) Shirgaon
	2) Khed	(1) Songaon (2) Susheri.
II. NASIK		
Jalgaon District	1) Jalgaon	(1) Avhane (2) Khedi Kh. (3) Vidgaon.
	2) Pachora	(1) Anturli Bk. (2) Anturli Kh. (3) Tarkhede Bk. (4) Tarkhede Kh.
III. PUNE		
Pune District	1) Khed	(1) Chimbali (2) Kanhewadi (3) Mohokal (4) Tiphanwadi.
	2) Maval	(1) Govhunje (2) Govitri (3) Kamshet (4) Kanhe (5) Nane (6) Sate.
IV. KOLHAPUR		
Satara District	1) Koregaon	(1) Naygaon (2) Phadtarwadi (3) Solshi.
	2) Phaltan	(1) Dudhe Bavi (2) Kurvali Bk. (3) Miradhe (4) Ravdi Bk.
V. AURANGABAD		
Beed District	1) Ashti	(1) Matavali (2) Matkuli.
	2) Ambajogai	(1) Radi.
VI. AMRAVATI		
Amravati District	1) Daryapur	(1) Chenda Kapur (2) Thilori.
	2) Morshi	(1) Nerpinglai.
VII NAGPUR		
Bhandara District	1) Bhandara	(1) Davdipar Bazar (2) Gunthara (3) Kanhad Moh (4) Khurshipar (5) Kodamendhi (6) Sawari.
	2) Gondia	(1) Birsi ((2) Kamtha (3) Khatia (4) Panjara (5) Paraswada (6) Zilmili.

Table 4.2 : List of Villages Included in Monitoring Study of Seed and Fertilizer Minikit Distribution Scheme in Rabi Season (1985-86)

Name of Division and District	Taluka	Selected Villages
I. KONKAN		
Ratnagiri District	1) Chiplun	(1) Asurde (2) Nandgaon.
	2) Khed	(1) Sukivali.
II. NASIK		
Jalgaon District	1) Jalgaon	(1) Asode (2) Avhane (3) Awar (4) Bhadli Bk. (5) Mamuarabad.
	2) Pachora	(1) Galan (2) Kalamsare (3) Lohari (4) Mondhale (5) Nimbhori (6) Pimpalgaon (7) Sarole (8) Savkhede Kh./Bk. (9) Shindad (10) Wanegaon.
III. PUNE		
Pune District	1) Khed	(1) Chaskaman (2) Chimbali (3) Kanhewadi (4) Mohokal.
	2) Maval	(1) Gavhunje (2) Govitri (3) Nane (4) Nanoli.
IV. KOLHAPUR		
Satara District	1) Koregaon	(1) Chanchali (2) Chilewadi (3) Hasewadi (4) Nagewadi.
	2) Phaltan	(1) Gokhali (2) Sangavi.
V. AURANGABAD		
Beed District	1) Ashti	(1) Ashta (2) Dhanora (3) Takalsing.
	2) Ambajogai	(1) Dharmapuri (2) Lokandi Savergaon (3) Pangri.
VI. AMRAVATI		
Amravati District	1) Daryapur	(1) Banosa (2) Daryapur (3) Kalashi (4) Mahuli (5) Nalwada (5) Thilori (7) Wadnergangai (8) Yeoda.
	2) Morshi	(1) Ambada (2) Hiwarkhed (3) Khanapur (4) Nerpinglai.
VII. NAGPUR		
Bhandara District	1) Bhandara	(1) Berodi (2) Bhilewada (3) Davdipar Bazar (4) Karchakheda (5) Kharbi (6) Pahela (7) Parsodi.
	2) Gondia	(1) Chargaon (2) Kamtha (3) Panjara (4) Zilmili.

4.1 Composition of Seed Minikit Beneficiaries

As noted earlier, one of the most important directives for the distribution of Minikits, was that the marginal, small and S.C., S.T. farmers should be given preference. To see, how far this directive has been put to practice, we classified the total number of beneficiaries into different community categories and different land-holding size-groups. Table 4.3 gives the distribution of sample families according to the community categories for kharif season and Table 4.4 for rabi season. Of the total 1,057 beneficiaries, covered in kharif season only 151 (14.29 per cent) belonged to the Scheduled Castes and 55 (5.20 per cent) belonged to the Scheduled Tribes. In rabi season the corresponding percentages were 11.36 and 5.64 respectively.

As noted in the last chapter, the proportion of the Scheduled Castes and the Scheduled Tribes in the total population in the seven selected districts as per 1981 Population Census was about 15 per cent and 7 per cent respectively and the corresponding proportion among the male cultivators was about 7 per cent among both the Scheduled Castes and the Scheduled Tribes. If the district-wise coverage is examined it will be noted that among the sample of beneficiaries covered in kharif season, preference has been given to the Scheduled Caste cultivators in all the districts except Bhandara and Ratnagiri and in rabi season, in all the districts except Jalgaon, Bhandara and Ratnagiri districts. Scheduled Tribes were neglected in all the districts in both the seasons except for Bhandara district in kharif season where they formed 22 per cent of the sample beneficiaries as against their share of about 18 per cent among the rural male cultivators in the district.

Tables 4.5 and 4.6 give the information regarding the land-holding size groupwise number of beneficiaries in all the seven districts. It can be seen that of the total number of beneficiaries, a little more than 31 per cent, belonged to the category of

Table 4.3 : Districtwise Distribution of Sample Families according to Community (Kharif Season)

District	Scheduled Castes beneficiaries	Scheduled Tribes beneficiaries	Other beneficiaries	Total
Ratnagiri	8 (5.26)	4 (2.63)	140 (92.11)	152 (100.00)
Jalgaon	31 (20.53)	-	120 (79.47)	151 (100.00)
Pune	13 (8.61)	5 (3.31)	133 (88.08)	151 (100.00)
Satara	29 (19.59)	-	119 (80.41)	148 (100.00)
Beed	19 (12.58)	-	132 (87.42)	151 (100.00)
Amravati	22 (14.67)	12 (8.00)	116 (77.33)	150 (100.00)
Bhandara	29 (18.83)	34 (22.08)	91 (59.09)	154 (100.00)
Total	151 (14.29)	55 (5.20)	851 (80.51)	1,057 (100.00)

(Figures in brackets indicate percentage to the total number of beneficiaries.)

Table 4.4 : Districtwise Distribution of Sample Families according to Community (Rabi Season)

District	Scheduled Castes beneficiaries	Scheduled Tribes beneficiaries	Other beneficiaries	Total
Ratnagiri	8 (5.44)	0	139 (94.56)	147 (100.00)
Jalgaon	1 (0.66)	21 (13.91)	129 (85.43)	151 (100.00)
Pune	16 (10.88)	4 (2.72)	127 (86.39)	147 (100.00)
Satara	19 (12.75)	5 (3.36)	125 (83.89)	149 (100.00)
Beed	37 (25.00)	24 (16.22)	86 (58.79)	148 (100.00)
Amravati	22 (14.77)	2 (1.34)	125 (83.89)	149 (100.00)
Bhandara	16 (10.26)	3 (1.92)	137 (87.82)	156 (100.00)
Total	119 (11.36)	59 (5.64)	869 (83.00)	1,047 (100.00)

(Figures in brackets indicate percentage to the total number of beneficiaries.)

Table 4.5 : Districtwise Distribution of Minikit Beneficiaries by Size of Land-holding (Kharif Season)

District	Size of land-holding (Ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	Number of beneficiaries					
Ratnagiri	53 (35.57)	47 (31.54)	14 (9.40)	32 (21.48)	3 (2.01)	149 (100.00)
Jalgaon	56 (38.36)	45 (30.82)	26 (17.81)	16 (10.96)	3 (2.05)	146 (100.00)
Pune	25 (16.56)	45 (29.80)	44 (29.14)	31 (20.53)	6 (3.97)	151 (100.00)
Satara	27 (18.88)	57 (39.86)	39 (27.27)	15 (10.49)	5 (3.50)	143 (100.00)
Beed	41 (27.15)	66 (43.71)	35 (23.18)	9 (5.96)	-	151 (100.00)
Amravati	38 (25.34)	53 (35.33)	30 (20.00)	21 (14.00)	8 (5.33)	150 (100.00)
Bhandara	91 (59.48)	56 (36.60)	6 (3.92)	-	-	153 (100.00)
Total	331 (31.73)	369 (35.38)	194 (18.60)	124 (11.89)	25 (2.40)	1,043* (100.00)

*. Information on size group not available for 4 cases.

(Figures in brackets indicate percentage to the total number of beneficiaries.)

Table 4.6 : Districtwise Distribution of Sample Families by Size of Land-holding (Rabi Season)

District	Size of land-holding (Ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	Number of families					
Ratnagiri	121 (82.31)	18 (12.24)	6 (4.08)	2 (1.36)	-	147 (100.00)
Jalgaon	21 (13.91)	21 (13.91)	46 (30.46)	48 (31.79)	15 (9.93)	151 (100.00)
Pune	36 (24.49)	47 (31.97)	39 (26.53)	24 (16.33)	1 (0.68)	147 (100.00)
Satara	21 (14.09)	47 (31.54)	61 (40.94)	20 (13.42)	-	149 (100.00)
Beed	46 (31.08)	87 (58.78)	10 (6.76)	5 (3.38)	-	148 (100.00)
Amravati	24 (16.11)	47 (31.54)	27 (18.12)	40 (26.85)	11 (7.38)	149 (100.00)
Bhandara	47 (30.13)	65 (41.67)	35 (22.44)	8 (5.13)	1 (0.64)	156 (100.00)
Total	316 (30.18)	332 (31.71)	224 (21.39)	147 (14.04)	28 (2.67)	1,047 (100.00)

(Figures in brackets indicate percentage to the total No.of families.)

marginal farmers and about 35 per cent were small farmers. The marginal and small farmers together constituted more than 66 per cent of the total beneficiaries in kharif season while in rabi season they formed respectively 30 per cent and 32 per cent of the total beneficiaries. If the districtwise distribution is examined it will be seen that a definite emphasis on small-marginal farmers is put in Bhandara district in kharif season and in Ratnagiri district in rabi season. In Jalgaon, Satara and Amravati they did not get even a proportional representation.

4.2 Districtwise Distribution of Minikit Beneficiaries

In all the seven districts, excepting Satara (148), the required number (150) of beneficiaries have been surveyed. Of the total number of 1,057 beneficiaries covered in kharif season, 52 cultivators reported that they had not received seed minikits (Table 4.7). In Beed district there was not a single person

Table 4.7 : Districtwise Distribution of Minikit Beneficiaries (Kharif Season)

District	No. of beneficiaries who received seed minikit in time	No. of beneficiaries who did not receive seed minikit in time	Total No. of beneficiaries who have received seed minikit	No. of beneficiaries who did not receive seed minikit	Total families included in the sample
Ratnatiri	94 (61.84)	47 (30.92)	141 (92.76)	11 (7.24)	152 (100.00)
Jalgaon	138 (91.39)	11 (7.28)	149 (98.68)	2 (1.32)	151 (100.00)
Pune	126 (83.44)	1 (0.67)	127 (84.11)	24 (15.89)	151 (100.00)
Satara	138 (93.24)	3 (2.03)	141 (95.27)	7 (4.73)	148 (100.00)
Beed	151 (100.00)	-	151 (100.00)	-	151 (100.00)
Amravati	142 (94.67)	1 (0.67)	143 (95.33)	7 (4.67)	150 (100.00)
Bhandara	152 (98.70)	1 (6.65)	153 (99.35)	1 (0.65)	154 (100.00)
Total	941 (89.03)	64 (6.05)	1,005 (95.08)	52 (4.92)	1,057 (100.00)

(Figures in brackets indicate percentage to the total number of beneficiaries.)

belonging to such a category, whereas in Pune district, there were as many as 24 such cultivators. In Ratnagiri there were 11 such cases and in Amravati and Satara 7 such cases each were recorded. In rabi season, of the 1,047 beneficiaries covered in the survey there were 52 such cases of which 23 were from Ratnagiri and 17 from Amravati district (Table 4.8).

Table 4.8 : Districtwise Distribution of Minikit Beneficiaries (Rabi Season)

District	No. of beneficiaries who received seed minikit in time	No. of beneficiaries who did not receive seed minikit in time	Total No. of beneficiaries who received seed minikit	No. of beneficiaries who have not received seed minikit	Total families included in the sample
Ratnagiri	23 (15.65)	101 (68.70)	124 (84.35)	23 (15.65)	147 (100.00)
Jalgaon	146 (96.69)	0	146 (96.69)	5 (3.31)	151 (100.00)
Pune	143 (97.28)	0	143 (97.28)	4 (2.72)	147 (100.00)
Satara	146 (97.99)	0	146 (97.99)	3 (2.01)	149 (100.00)
Beed	80 (54.05)	68 (45.95)	148 (100.00)	0	148 (100.00)
Amravati	131 (87.92)	1 (0.67)	132 (88.59)	17 (11.41)	149 (100.00)
Bhandara	156 (100.00)	0	156 (100.00)	0	156 (100.00)
Total	825 (78.80)	170 (16.23)	995 (95.03)	52 (4.97)	1,047 (100.00)

(Figures in brackets indicate percentage to the total number of beneficiaries.)

Table 4.9 gives the distribution of the beneficiaries according to the receipt of seed and/or fertilizer minikits. Of the total beneficiaries, 550 beneficiaries (i.e. about 52 per cent) obtained one seed minikit and one fertilizer minikit each in kharif season. In rabi season the corresponding proportion

Table 4.9 : Districtwise Distribution of Sample Families according to Receipt of Seed and/or Fertilizer Minikit (Kharif Season)

District	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Total
Ratnagiri	63 (41.45)	-	60 (39.48)	8 (5.26)	3 (1.97)	18 (11.84)	152
Jalgaon	81 (53.65)	1 (0.66)	57 (37.75)	-	2 (1.32)	10 (6.62)	151
Pune	48 (31.79)	2 (1.32)	37 (29.51)	24 (15.69)	-	40 (26.49)	151
Satara	30 (20.27)	1 (0.68)	97 (65.54)	2 (1.35)	5 (3.38)	13 (8.78)	148
Beed	94 (62.25)	1 (0.66)	48 (31.79)	-	-	8 (5.30)	151
Amravati	82 (54.67)	2 (1.33)	47 (31.33)	7 (4.67)	-	12 (8.00)	150
Bhandara	152 (98.70)	-	-	1 (0.65)	-	1 (0.65)	154
Total	550 (52.04)	7 (0.66)	346 (32.73)	42 (3.97)	10 (0.95)	102 (9.65)	1,057 (100.00)

(Figures in brackets indicate percentages to the total number of beneficiaries.)

Category 1 : One seed minikit + 1 fertilizer minikit (used for the same crop)

Category 2 : One seed minikit + 1 fertilizer minikit (not used for the crop for which seed minikit was given)

Category 3 : Only one seed minikit (no fertilizer minikit)

Category 4 : Only one fertilizer minikit (no seed minikit)

Category 5 : No minikit received

Category 6 : More than one seed minikit.

was much higher. About 74 per cent of the beneficiaries received both seed and fertilizer minikits while 22 per cent received seed minikit only. (Table 4.10) If the new and improved varieties, propagated through the minikits are to demonstrate their real potential, then each seed minikit must be accompanied by a fertilizer minikit. Otherwise, the results may not be encouraging

Table 4.10 : Districtwise Distribution of Beneficiaries according to Receipt of Seed and/or Fertilizer Minikit (Rabi Season)

District	Category 1	Category 2	Category 3	Category 4	Total
Ratnagiri	8 (5.44)	8 (5.44)	129 (87.76)	2 (1.36)	147 (100.00)
Jalgaon	11 (7.28)	5 (3.31)	135 (89.40)	-	151 (100.00)
Pune	67 (45.58)	4 (2.72)	76 (51.70)	-	147 (100.00)
Satara	80 (53.69)	2 (1.34)	64 (42.95)	3 (2.01)	149 (100.00)
Beed	65 (43.92)	-	83 (56.08)	-	148 (100.00)
Amravati	6 (4.03)	17 (11.41)	126 (84.36)	-	149 (100.00)
Bhandara	-	-	156 (100.00)	-	156 (100.00)
Total	237 (22.64)	36 (3.44)	769 (73.45)	5 (0.47)	1,047 (100.00)

(Figures in brackets indicate percentage to total.)

Category 1 : Only seed Minikit

Category 2 : Only fertilizer.Minikit

Category 3 : Both seed and fertilizer Minikit

Category 4 : Minikit not received.

to the extent they should be and the purpose of minikit may be defeated. If the Government feels that although farmers are aware of the use of importance of fertilizer, they are constrained by unsound economic conditions, then the distribution of fertilizer minikits should be of a selective nature, where only the needy, small and marginal farmers should get the benefits. However, this does not seem to be happening. In many of the districts in our sample it appears that the larger farmers got a somewhat favoured treatment. Also, we have experienced, from our discussions with the villagers, beneficiaries and Village Extension Workers themselves, that there is no careful scrutiny of the beneficiaries before the minikits are distributed.

To go back to Table 4.9, we can see that 7 beneficiaries got the seed as well as fertilizer minikit but they did not use the fertilizer minikit for the crop, for which it was given to them. Although, the number of such cases is only marginal, this tendency may be noted for appropriate guidance/instructions to be given to the farmers. Further, we can see that there were 42 beneficiaries in kharif season and 36 in rabi season who were given only fertilizer minikits. No doubt, this may serve the demonstration purpose; however it may be achieved better, if it is ensured that the fertilizer minikit is applied to new/improved varieties. Without this, the use of fertilizers may not be optimum. It is important to point out here that, it was our experience in the field that, at times, in order to pacify some farmers who did not get any seed minikits, fertilizer kits were given. This kind of distribution for the sake of distribution should be avoided. It must be noted that we found 10 beneficiaries in kharif season and 5 in rabi season again a marginal number who got neither seed nor fertilizer minikit. These families were interviewed because their names appeared in the lists of the beneficiaries supplied to us. These are the cases where the benefits have gone to someone else who obviously would not have got them ordinarily. Such misappropriation must be carefully looked into and avoided. The last category is that of the beneficiaries who have got more than one seed minikits. Here it can be seen that in spite of the instructions from the Department, about 10 per cent of the total beneficiaries have got more than one seed minikits.

A related matter, which needs to be pointed out here is that, out of the 102 beneficiaries who have got more than one seed minikits in kharif season, there are 40 beneficiaries who have got two minikits each for intercropping. The information regarding districtwise number of beneficiaries who have received minikits for intercropping is presented in Table 4.11. The Government is emphasizing a great deal on intercropping and encouraging the

Table 4.11 : Districtwise Number of Beneficiaries Who Received Seed Minikits for Intercropping (Kharif Season)

Name of the district	Jowar/ Tur	Bajra/ Tur	Jowar/ Udid	Bajra/ Udid	Total	Percentage to the total No.of seed minikit beneficiaries
	Number of beneficiaries					
Ratnagiri	-	-	-	-	-	-
Jalgaon	-	3	1	1	5	3.35
Pune	2	2	3	3	10	7.87
Satara	1	4	1	2	8	5.67
Beed	-	6	-	-	6	3.97
Amravati	8	2	-	1	11	7.69
Bhandara	-	-	-	-	-	-
Total	11	17	5	7	40	3.98

farmers, who take cereal crops, to take pulses and oilseeds crops as intercrops; e.g. tur or black gram can be taken with jowar or bajra. Considering the importance attached to intercropping, the actual distribution of minikits for intercropping seems to be quite limited. At least in our sample, out of the total beneficiaries only 40 beneficiaries, just about 4 per cent, turned out to be the beneficiaries who have got seed minikits for intercropping. Of these 40, more than 50 per cent are concentrated in Amravati and Pune districts. Ratnagiri and Bhandara, for obvious reasons, do not have any such beneficiaries. In dry land agriculture, crop-planning is extremely important. Especially, in the light of the well known uncertainty of rain it always pays to take more than one crop by intercropping. Therefore intercropping needs to be advocated on a larger scale.

4.3 Distribution of Fertilizer Minikits

As stated earlier, the minikit programme involves, apart from seed minikits, distribution of fertilizer minikits as well. Now, we shall take a look at some details regarding fertilizer

Table 4.12 : Distribution of Total and Fertilizer Minikit Beneficiaries by District and Size of Land-holding (Kharif Season)

District		Size of land-holding (Ha.)					Total
		Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
Ratnagiri	1	53	47	14	32	3	149
	2	36	21	10	20	2	89
	3	67.9	44.7	71.4	62.5	66.7	59.7
Jalgaon	1	56	45	26	16	3	146
	2	40	29	10	4	-	83
	3	71.4	64.4	38.5	25.0	-	56.8
Pune	1	25	45	44	31	6	151
	2	11	32	29	23	5	100
	3	44.0	71.1	65.9	74.2	83.3	66.2
Satara	1	27	57	39	15	5	143
	2	9	11	12	4	1	37
	3	33.3	19.3	30.8	26.7	20.0	25.9
Beed	1	41	66	35	9	-	151
	2	20	39	30	8	-	97
	3	48.8	59.1	85.7	88.9	-	64.2
Amravati	1	38	53	30	21	8	150
	2	22	36	19	10	6	93
	3	57.9	67.9	63.3	47.6	75.0	62.0
Bhandara	1	91	56	6	-	-	153
	2	91	56	6	-	-	153
	3	100.0	100.0	100.0	-	-	100.0
Total	1	331	369	194	124	25	1,043*
	2	229	224	116	69	14	652
	3	69.2	60.7	59.8	55.6	56.0	62.5

* 4 families for whom information on land-holding was not available are excluded. 10 cases excluded as spurious.

1 = Total number of beneficiaries.

2 = Number of fertilizer minikit beneficiaries.

3 = Fertilizer minikit beneficiaries as percentage of total beneficiaries.

minikits. Table 4.12 gives the information regarding districtwise, size groupwise number and percentage of fertilizer minikit beneficiaries. In the total 1,047 beneficiaries included in the study during kharif season 652 beneficiaries got the fertilizer minikits. There is a considerable districtwise variation in the number of

beneficiaries. In Bhandara district, for example, all the beneficiaries obtained fertilizer minikits along with the seed minikits whereas in Satara district only 37 beneficiaries (26 per cent) out of a total of 143 obtained fertilizer minikits. In between these two extremes, there are other districts; in Pune 66 per cent beneficiaries, in Beed 64 per cent, in Amravati 62 per cent, in Ratnagiri 60 per cent and in Jalgaon about 57 per cent beneficiaries obtained fertilizer minikit. If we look at the size-groupwise figures of the number of beneficiaries, it will be seen that among the marginal farmers nearly 70 per cent received the fertilizer minikit. The corresponding proportion among the other size groups was about 60 per cent. If the districtwise and size-groupwise percentages are examined many districts show different trends, e.g. in Amravati 75 per cent of the large farmers got fertilizer minikits (i.e. 6 out of 8 beneficiaries in the group obtained fertilizers) whereas, in the marginal and small size-groups, this percentage is about 58 per cent and 68 per cent respectively. Similar trends can be seen in Beed and Pune districts. It is not possible to say that the percentage of fertilizer minikit beneficiaries increases systematically over the size-groups, but it can be seen that greater number of larger farmers have got fertilizer minikits. Obviously, in terms of absolute numbers, the larger farmers have received less number of fertilizer minikits but the larger farmers are also less in number. As the large farmers are capable of buying and using fertilizers they should not get included among the recipients of free fertilizer minikits.

Table 4.13 gives the details regarding the districtwise and typewise number of fertilizer minikits. The fertilizer minikits are of three types: A B and C. In our sample A, C and what was described by the respondents as "mixed" type were reported in kharif season and A,C and "mixed" in rabi season. The C type of fertilizers are predominantly used for pulses and oilseeds crops. It appears that most of the pulses and oilseeds crops minikits are accompanied

Table 4.13 : Districtwise Distribution of Fertilizer Minikit Beneficiaries by Type of Fertilizer (Kharif Season)

District	Fertilizer		Mixed fertilizer	Total
	Type A	Type C		
	Number of Beneficiaries			
Ratnagiri	66 (74.15)	23 (25.84)	-	89 (13.65)
Jalgaon	33 (39.75)	50 (60.24)	-	83 (12.73)
Pune	8 (8.00)	92 (92.00)	-	100 (15.34)
Satara	20 (54.05)	17 (45.94)	-	37 (5.67)
Beed	1 (1.03)	38 (39.17)	58 (59.79)	97 (14.88)
Amaravati	38 (40.86)	54 (58.06)	1 (1.07)	93 (14.26)
Bhandara	-	-	153 (100.00)	153 (23.47)
Total	166 (25.46)	274 (42.03)	212 (32.51)	652 (100.00)

(Figures in brackets indicate percentages.)

Table 4.14 : Districtwise Distribution of Fertilizer Minikit Beneficiaries by Type of Fertilizer (Rabi Season)

District	Fertilizer@		Mixed fertilizer	Total
	Type A	Type C		
	Number of beneficiaries			
Ratnagiri	1 (0.74)	134 (99.26)	-	135 (16.83)
Jalgaon	43 (30.71)	97 (69.29)	-	140 (17.46)
Pune	20 (25.00)	60 (75.00)	-	80 (9.97)
Satara	20 (31.25)	44 (68.75)	-	64 (7.98)
Beed	6 (7.14)	23 (27.38)	55 (65.48)	84 (10.47)
Amravati	-	114 (79.72)	29 (20.28)	143 (17.83)
Bhandara	-	-	156 (100.00)	156 (19.45)
Total	90 (11.22)	472 (58.85)	240 (29.93)	802* (100.00)

* Information not available for 3 cases.
(Figures in brackets indicate percentages.)
@ A type fertilizer minikits contained 5 kg of Urea and 3 kg of Di-ammonium phosphate.
C type fertilizer minimits contained 6 kg of Di-ammonium phosphate.

by fertilizer minikits. Cereal crop minikits have got relatively less number of fertilizer minikits.

4.4 Timeliness of Minikit Distribution

If the objectives of the minikit distribution are to be achieved fully, then it is absolutely essential that the minikits should reach the farmers in time. If the minikits reach after the sowing is over, then the beneficiary may not sow the seeds or may sow the seeds in the inferior land which might affect the yield and so the purpose of giving the minikit may get defeated. Therefore, it is essential to find out whether the beneficiaries received the seed minikits in time or not. In Table 4.7 the information on the number of beneficiaries who got the seed minikit in time is presented. It will be seen from the Table that in kharif season about 89 per cent of the beneficiaries said that they received the seed minikit in time. The corresponding proportion in rabi season was 79 per cent for the total sample. This was somewhat unexpected because in most of the districts, we had already observed that the minikits had reached late. The Village Extension Workers as well as the Agricultural Officers themselves had admitted this. One explanation is perhaps, that: in most of the districts where we carried out our survey work, the monsoon was delayed and hence the sowing operations also were carried out late. Therefore, although the minikits reached late, they were found to be still in time as the sowing was delayed. Now, if the sowing operations were to be carried out as per schedule, the minikits certainly could not have reached in time. This can be somewhat corroborated by looking at the figures for Ratnagiri district. In Ratnagiri district, where the monsoon started on schedule, we find that only 61 per cent beneficiaries reported that they received the minikits in time in kharif season. In rabi season as many as 69 per cent said that they did not receive the minikit in time. We feel that the high figure given in the Table should not be taken at its face value. Also, some of the beneficiaries, as well our investigators pointed

Table 4.15 : Distribution of Fertilizer Minikits by Type of Fertilizer and Size of Land-holding (Rabi Season)

Types of fertilizer	Size of landholding (Ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	Number of minikits					
A type	17 (5.41)	17 (6.37)	27 (13.92)	27 (21.09)	6 (22.22)	94 (10.11)
C type	230 (73.25)	145 (54.31)	110 (56.70)	73 (57.03)	15 (55.56)	573 (61.61)
Mixed	67 (21.34)	105 (39.32)	57 (29.38)	28 (21.88)	6 (22.22)	263 (28.28)
Total	314 (100.00)	267 (100.00)	194 (100.00)	128 (100.00)	27 (100.00)	930 (100.00)

(Figures in the brackets indicate percentages to the total number of minikits.)

Table 4.16 : Seed Minikts Distribution by Different Agencies (Kharif Season)

District	Village Level Worker	Village Extension Worker	Others
	Number of beneficiaries		
Ratnagiri	2 (1.42)	139 (98.58)	-
Jalgaon	20 (13.43)	118 (79.19)	11 (7.38)
Pune	-	115 (90.55)	12 (9.45)
Satara	47 (33.33)	94 (66.67)	-
Beed	-	151 (100.00)	-
Amravati	-	143 (100.00)	-
Bhandara	-	153 (100.00)	-
Total	69 (6.87)	913 (90.84)	23 (2.29)

(Figures in brackets indicate percentage to the total number of beneficiaries.)

out that some of the beneficiaries reported to have got the minikits in time because, they were afraid that if they reported otherwise, they may not get the benefits next year.

Fertilizer minikits were reportedly received in time in about 82 per cent of the cases in rabi season, if all the districts are considered together. Corresponding districtwise proportion was 100 in all the districts except Beed where about 55 per cent of the beneficiaries reported that they did not receive the fertilizer minikit in time.

Table 4.16 shows the districtwise seed minikit distribution by different agencies. About 90 per cent minikits in kharif season and 99 per cent in rabi season were distributed by the Village Extension Workers (V.E.Ws) which is the appropriate agency for distribution. In Satara and Jalgaon districts Village Level workers (V.L.Ws) distributed the Minikits respectively in about 53 per cent and 14 per cent cases. In rabi season all the beneficiaries except for 2 cases in Beed and 5 in Bhandara district received seed through VEWs.

4.5 Guidance to Beneficiaries

If the Minikits are to be utilized successfully to achieve their full potential then it is necessary that the beneficiaries should be given proper guidance at the time of sowing and at various other stages of cultivation. In our inquiry we found that approximately 69 per cent of the total beneficiaries received guidance on various counts in kharif season; the corresponding proportion was higher in rabi season viz. 88 per cent. Tables 4.17 and 4.18 give the relevant information. It is interesting to note the districtwise variation in the figures. It can be seen that in kharif season in Beed district 99 per cent beneficiaries got guidance, whereas in Ratnagiri district only about 27 per cent of the beneficiaries claimed to have received guidance on any count. In between these two extremes, in other districts like Amaravati 92 per cent, Pune 81 per cent, Jalgaon 51 per cent and Satara 46 per

Table 4.17 : Districtwise Number of Beneficiaries* Who Received Guidance (Kharif Season)

District	Beneficiaries who received guidance	Beneficiaries who did not get any guidance
Ratnagiri	38 (26.81)	103 (73.19)
Jalgaon	75 (50.35)	74 (49.65)
Pune	101 (80.80)	26 (19.20)
Satara	50 (35.71)	91 (64.28)
Beed	143 (98.62)	8 (1.38)
Amravati	131 (91.60)	12 (8.39)
Bhandara	153 (100.00)	-
Total	691 (68.76)	314 (31.24)

(Figures in brackets indicate percentages to the total number of beneficiaries.)
* Refers to seed minikit beneficiaries.

Table 4.18 : Districtwise Number of Beneficiaries Who Received Guidance (Rabi Season)

District	Beneficiaries who received guidance	Beneficiaries who did not get any guidance	Total
Ratnagiri	123 (83.67)	24 (16.33)	147 (100.00)
Jalgaon	146 (96.69)	5 (3.31)	151 (100.00)
Pune	140 (95.24)	7 (4.76)	147 (100.00)
Satara	85 (57.05)	64 (42.95)	149 (100.00)
Beed	146 (98.65)	2 (1.35)	148 (100.00)
Amravati	127 (85.23)	22 (14.77)	149 (100.00)
Bhandara	156 (100.00)	0	156 (100.00)
Total	923 (88.16)	124 (11.84)	1,047 (100.00)

(Figures in brackets indicate percentages to the total number of beneficiaries.)

cent of the beneficiaries received guidance. In rabi season, the proportion of those receiving guidance was noted to be low in Satara district. These figures clearly reflect the districtwise variations in the efforts of the V.E.Ws and the T. & V. organization. To probe this point a little further, it is worthwhile taking a look at Table 4.19 which gives the information regarding the districtwise number of beneficiaries who received guidance under different counts. Sowing is a crucial operation for the success of minikit scheme. The department already recognizes this and has issued clear instructions that the V.E.Ws are to guide the beneficiaries at the time of sowing. Table 4.19 shows that in kharif season about 62 per cent beneficiaries were guided by V.E.Ws and others. This means a sizable number of beneficiaries did not get any guidance. It appears that the government instruction is not given its due importance. The performance seems better in rabi

Table 4.19 : Districtwise Number of Beneficiaries Who Received Guidance on Different Counts (Kharif Season)

District	Number of beneficiaries who received guidance regarding					
	Sowing	Use of fertilizers	Plant protection	Watering	Use of improved implements	Marketing of the produce
Ratnagiri	36 (23.68)	34 (22.37)	5 (3.29)	3 (1.97)	2 (1.32)	1 (0.66)
Jalgaon	70 (46.36)	68 (45.03)	63 (41.72)	63 (41.72)	63 (41.72)	29 (19.21)
Pune	100 (66.23)	94 (62.25)	57 (37.75)	42 (27.81)	42 (27.81)	40 (26.49)
Satara	50 (33.78)	49 (33.11)	48 (32.43)	46 (31.08)	44 (29.73)	4 (2.70)
Beed	142 (94.04)	142 (94.04)	1 (0.66)	1 (0.66)	3 (1.99)	-
Amravati	117 (78.00)	124 (82.67)	121 (80.67)	42 (28.00)	46 (30.67)	49 (32.67)
Bhandara	153 (99.35)	153 (99.35)	153 (99.35)	153 (99.35)	4 (0.60)	46 (29.87)
Total	668 (63.20)	664 (62.82)	448 (42.38)	350 (33.11)	204 (19.30)	169 (15.99)

(Figures in brackets indicate percentage to total beneficiaries.)

Table 4.20 : Districtwise Number of Beneficiaries Who Received Guidance on Different Counts (Rabi Season)

District	Number of beneficiaries who received guidance regarding					
	Sowing	Use of fertilizer	Plant protection	Watering	Use of improved implements	Marketing of the produce
Ratnagiri	122 (82.99)	121 (82.31)	6 (4.08)	5 (3.40)	5 (3.40)	-
Jalgaon	146 (96.69)	146 (96.69)	146 (96.69)	146 (96.69)	146 (96.69)	69 (45.70)
Pune	136 (92.52)	104 (70.75)	60 (40.82)	38 (25.85)	18 (12.24)	7 (4.76)
Satara	68 (45.64)	65 (43.62)	48 (32.21)	41 (27.52)	32 (21.48)	-
Beed	146 (98.65)	146 (98.65)	98 (66.22)	1 (0.68)	21 (14.19)	12 (8.11)
Amravati	119 (79.87)	127 (85.23)	121 (81.21)	10 (6.71)	29 (19.46)	21 (14.09)
Bhandara	156 (100.00)	156 (100.00)	156 (100.00)	156 (100.00)	4 (2.56)	128 (82.05)
Total	893 (85.29)	865 (82.62)	635 (60.65)	397 (37.92)	255 (24.36)	237 (22.64)

(Figures in brackets indicate percentage to total beneficiaries.)

season when about 85 per cent of the beneficiaries reportedly received guidance at the sowing time. Table 4.20 gives further information on various other counts like use of fertilizer, plant protection, watering, use of improved implements and marketing. It can be seen that the percentage of beneficiaries getting guidance goes on decreasing on these various counts and for marketing of agricultural produce of the crop taken from the seed minikit, only 16 per cent of the total beneficiaries claimed to have got some guidance in kharif season and 23 per cent in rabi season. If the beneficiaries are to repeat the new varieties given in the Minikit and increase the area under new varieties, then it is imperative that they should receive guidance on the

various counts including marketing. This is especially true for pulses and oilseeds crops.

In the context of guidance, we would like to make a point in relation to the area under the seed minikit. We found that about 35 per cent of the total number of minikits distributed were sown in either less than .10 Ha or more than .10 Ha. There may be a number of reasons for this; but it is also to be noted that it shows that while the minikits are sown, in order to obtain the best results, a lot more guidance and care has to be taken to see that, the seeds are sown in the stipulated area.

Guidance was generally given individually to the farmers. It was noted in rabi season that in all the districts except Beed, in more than 90 per cent of the cases this method was followed. Only in Beed district guidance was given individually in about 70 per cent of the cases and in a group in 30 per cent of the cases. If all the districts are considered together the corresponding proportions were 92 per cent and 8 per cent respectively.

4.6 Composition of Seed Minikits

After analysing the data at the beneficiary level we shall now try to analyse the minikits data. Table 4.21 gives the information regarding size groupwise and cropwise distribution of minikits. In all, 1,108 minikits of 16 crops have been distributed in our sample in kharif season and 1,310 seed minikits of 12 crops in rabi season. In kharif season, the maximum number of minikits distributed were of bajra crop. After bajra, minikits of tur, jowar, rice, groundnut and sunflower follow in that order. The Table shows that the small farmers obtained the maximum number of minikits, 391 (i.e. about 35 per cent) of the total number distributed. The marginal farmers got 344 minikits (i.e. about 31 per cent). Thus the marginal and the small farmers together account for 66 per cent of the total number of minikits distributed. The large farmers got only 28 minikits. In the rabi season, jowar minikits account for 27 per cent of the total

Table 4.21 : Distribution of Seed Minikits by Crop and Size of Land-holding (Kharif Season)

Crop	Size of land-holding (Ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	Number of seed minikits					
Jowar	41	56	32	22	4	155
Bajra	74	98	64	37	2	275
Maize	1	-	2	-	-	3
Ragi	18	28	5	13	-	64
Rice	77	48	10	19	1	155
Rala	1	1	-	-	-	2
Groundnut	30	34	24	22	2	112
Soyabean	3	1	1	1	1	7
Sunflower	21	40	24	11	3	99
Sesamum	2	2	1	1	-	6
Castor	-	-	2	-	-	2
Green Gram	13	9	5	2	3	32
Ghevada	1	3	2	1	-	7
Tur	52	62	24	13	10	161
Black Gram	8	7	4	1	1	21
Cotton	2	2	2	-	1	7
Total	344	391	202	143	28	1,108

minikits, followed by safflower (22 per cent), sunflower (11 per cent), gram (16 per cent), and groundnut (7 per cent) (Table 4.22). The marginal farmers received 34 per cent of the minikits and the small farmers 30 per cent of the total minikits while the large farmers about 2.5 per cent.

We have classified the minikits of all the crops in different groups like cereals, oilseeds, pulses and cotton and we shall have a look at this typewise distribution. Table 4.23 gives

Table 4.22 : Distribution of Seed Minikits by Crop and Size of Land-holding (Rabi Season)

Crop	Size of land-holding (Ha.)					Total seed minikits	Per cent seed minikits
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10		
	Number of seed minikits						
Jowar	71 (20.06)	145 (40.96)	89 (25.14)	47 (13.28)	2 (0.56)	354 (100.00)	27.03
Wheat	11 (40.74)	5 (18.52)	6 (22.22)	5 (18.52)	-	27 (100.00)	2.06
Groundnut	77 (82.80)	13 (13.98)	3 (3.22)	-	-	93 (100.00)	7.10
Sunflower	57 (40.42)	44 (31.21)	30 (21.28)	9 (6.38)	1 (0.71)	141 (100.00)	10.76
Safflower	63 (21.72)	95 (32.76)	75 (25.87)	46 (15.86)	11 (3.79)	290 (100.00)	22.14
Sesamum	1 (33.33)	2 (66.67)	-	-	-	3 (100.00)	0.23
Tur	1 (14.28)	2 (28.58)	1 (14.28)	2 (28.58)	1 (14.28)	7 (100.00)	0.53
Gram	31 (14.83)	51 (24.41)	52 (24.88)	58 (27.75)	17 (8.13)	209 (100.00)	15.95
Peas	4 (36.36)	1 (9.09)	2 (18.19)	4 (36.36)	-	11 (100.00)	0.84
Kulith	46 (74.20)	12 (19.35)	3 (4.84)	1 (1.61)	-	62 (100.00)	4.73
Chavali	56 (78.87)	11 (15.49)	3 (4.23)	1 (1.41)	-	71 (100.00)	5.42
Wal	29 (69.05)	10 (23.81)	2 (4.76)	1 (2.38)	-	42 (100.00)	3.21
Total	447 (34.12)	391 (29.85)	266 (20.31)	174 (13.28)	32 (2.44)	1,310 (100.00)	100.00

(Figures in brackets indicate percentages to total seed minikits of each crop.)

this information. Let us consider the total figures initially. In kharif season, cereals accounted for about 60 per cent of the total minikits and oilseeds and pulses accounted for approximately 20 per cent each. The number of cotton minikits was very small and its percentage marginal. It is evident from the Table that

Table 4.23(A) : Distribution of Seed Minikits by Crop Category and Size of Land-holding (Kharif Season)

Category	Size of land-holding (Ha.)					Total	Per cent
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10		
	Number of seed minikits						
Cereals	212 (32.42)	231 (35.32)	113 (17.28)	91 (13.91)	7 (1.07)	654 (100.00)	59.0
Oilseeds	56 (24.67)	77 (33.95)	52 (23.32)	35 (15.42)	6 (2.64)	226 (100.00)	20.4
Pulses	74 (33.64)	81 (36.82)	35 (15.45)	17 (7.73)	14 (6.36)	221 (100.00)	19.8
Cotton	2 (28.57)	2 (28.57)	2 (28.57)	-	1 (14.28)	7 (100.00)	0.
Total	344 (31.05)	391 (35.29)	202 (18.23)	143 (12.91)	28 (2.53)	1,108 (100.00)	100.0

(Figures in brackets indicate percentages to crop category total.)

Table 4.23(B) : Percentage Share of Cereals, Oilseeds, Pulses and Cotton Seed Minikits in Total Minikits by Size of Land-holding (Kharif Season)

	Size of land-holding (Ha.)				
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10
	(1)	(2)	(3)	(4)	(5)
1. Cereals as a % of Total No. of minikits	61.63	59.08	55.94	63.64	25.00
2. Oilseeds as a % of Total No. of minikits	16.28	19.69	26.24	24.47	21.43
3. Pulses as a % of Total No. of minikits	21.51	20.72	16.83	11.89	50.00
4. Cotton as a % of Total No. of minikits	0.58	0.51	0.99	-	3.57
Total	100.00	100.00	100.00	100.00	100.00

although, the Government is emphasizing a great deal on the pulses and oilseeds crops, the majority of the minikits distributed are of cereals.

In rabi season, pulses and oilseeds are better represented. The percentage share of cereals, pulses and oilseed, was about 30 per cent, 40 per cent and 30 per cent respectively (Table 4.24(A)).

In Table 4.23(B) percentage of types of crops to the total number of minikits distributed in each size group are given for kharif season. It is very interesting to compare the size groups 1 and 5, i.e. the marginal and the large farmers. Of the total number of minikits distributed in size group 1, cereals have got the maximum share, whereas in size group 5 (i.e. large farmers) 50 per cent of the minikits distributed are of pulses. The percentage of oilseeds and cotton in size group 5 is more than that noted in size group 1. A similar picture is noted in rabi season also. The share of cereals is around 18 per cent in the case of marginal farmers and 38 per cent in the case of small farmers, while the corresponding proportion for large farmers is less than 7 per cent. It appears that, although the total number of minikits obtained by the large farmers is very small, they have obtained minikits of important types and costlier types. So although in terms of quantity the smaller farmers are favoured, the large farmers have got better types of crops in their share.

We shall now attempt to analyse the size groupwise, cropwise, and varietywise distribution of minikits (Tables 4.25 and 4.26). Some of the major crops like jowar, bajra, sunflower, green gram, gram and rice are considered. It can be seen that a number of varieties of different crops are distributed. At the same time, there are a number of varieties, recommended by the Agricultural Universities, which are not distributed, e.g. for Bajra, Mahatma Phule Krishi Vidyapeeth has recommended RHBH 372, 373 and 379. RHB-1 (Sangam) and RHRB-363 are also the new varieties recommended. Or for Rice, Konkan Krishi Vidyapeeth has recommended varieties

Table 4.24(A) : Distribution of Seed Minikits by Crop Category and Size of Land-holding (Rabi Season)

Category	Size of land-holding (Ha.)					Total	Per cent
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10		
	Number of seed minikits						
Cereals	82 (21.53)	150 (39.37)	95 (24.93)	52 (13.65)	2 (0.52)	381 (100.00)	29.08
Oilseeds	198 (37.57)	154 (29.22)	108 (20.49)	55 (10.44)	12 (2.28)	527 (100.00)	40.23
Pulses	167 (41.54)	87 (21.64)	63 (15.67)	67 (16.67)	18 (4.48)	402 (100.00)	30.69
Total	447 (34.13)	391 (29.85)	266 (20.30)	174 (13.28)	32 (2.44)	1,310 (100.00)	100.00

(Figures in brackets indicate percentages to crop category total.)

Table 4.24(B) : Percentage Share of Cereals, Oilseeds and Pulses Seed Minikits in Total Minikits by Size of Land-holding (Rabi Season)

	Size of land-holding (Ha.)				
	Upto 1 (1)	1 - 2 (2)	2 - 4 (3)	4-10 (4)	Above 10 (5)
1. Cereals as a % of Total No. of seed minikits	18.34	38.36	35.71	29.88	6.25
2. Oilseeds as a % of Total No. of minikits	44.30	39.39	40.60	31.61	37.50
3. Pulses as a % of Total No. of minikits	37.36	22.25	23.69	38.51	56.25
Total	100.00	100.00	100.00	100.00	100.00

Table 4.25 : Distribution of Seed Minikits by Crop-Variety and Size of Land-holding (Kharif Season)

Name of the variety	Size of land-holding (Ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	Number of seed minikits					
Jowar						
C.S.H.6	12	14	7	5	3	41
S.P.V.351	11	24	14	10	-	59
S.P.V.297	3	5	4	4	-	16
C.S.H.1	-	5	1	1	-	7
C.S.H.9	1	-	-	-	-	1
C.S.H.5	4	-	1	-	-	5
S.P.V.245	10	8	5	2	1	26
Total	41	56	32	22	4	155
Bajra						
W.C.C.75	21	32	19	13	-	85
I.C.M.S.7703	41	50	38	22	2	153
B.D.763	8	11	-	1	-	20
M.B.H.110	4	5	7	1	-	17
Total	74	98	64	37	2	275
Sunflower						
E.C.68414	4	7	5	2	-	18
Modern	17	33	19	9	3	81
Total	21	40	24	11	3	99
Green Gram						
S.8	2	-	2	1	1	6
J.781	-	-	1	-	-	1
T.A.P.7	3	2	1	-	-	6
Kopargaon	6	7	1	1	2	17
Vaishakhi	2	-	-	-	-	2
Total	13	9	5	2	3	32

(continued)

Table 4.25 : (continued)

Name of the variety	Size of land-holding (Ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
Tur						
B.D.N.II	40	56	22	13	10	141
C.11	12	6	2	-	-	20
Total	52	62	24	13	10	161
Rice						
Radhanagari	1	-	1	-	-	2
Ratna	21	13	2	5	1	42
P.B.N.1	-	-	-	1	-	1
Masuri	10	5	1	1	-	17
Ratnagiri 68	1	-	-	-	-	1
Jaya	4	1	2	3	-	10
R.P.4-14	7	4	1	7	-	19
I.E.T. 7575	2	3	-	1	-	6
Damodar	1	-	-	1	-	2
Sakoli 6	10	8	-	-	-	18
Shidhewahi 65	17	8	1	-	-	26
Patel 3	1	3	-	-	-	4
Kalinga	2	1	-	-	-	3
S.Y.E.75	-	1	-	-	-	1
R.P.W.617	-	1	2	-	-	3
Total	77	48	10	19	1	155

like Karjat 14-7, MK 47-22, SR 3-6. All such new varieties must be considered when the distribution is planned. In order to have a meaningful and useful distribution of minikits, it is essential to pre-plan the whole pattern of distribution, but at the same time some amount of flexibility to change the weightage given for different varieties and even for crops is also important in order to consider the uncertainties of rainfall.

A few cases were noted where minikits were not actually used. For example, in rabi season, 22 such cases were noted for seed minikits, the major reasons for not using the minikit were (1) minikit was received after sowing was over (12 cases), (2) rains were inadequate (6 cases). Fertilizer minikits were reportedly

Table 4.26 : Distribution of Seed Minikits by Crop-Variety and Size of Land-holding (Rabi Season)

Crop-Variety	Size of land-holding (Ha.)					
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	Total
	Number of seed minikits					
Jowar						
C.S.H.8R	7	24	24	14	-	69
R.S.V.9R	41	55	41	18	1	156
S.P.V.86	23	64	24	13	1	125
Total	71	143	89	45	2	350
Sunflower						
E.C.68414	11	10	8	4	1	34
Modern	-	31	22	5	-	58
Total	11	41	30	9	1	92
Safflower						
Bhima	56	80	55	37	11	239
Tara	5	14	16	9	-	44
Total	61	94	71	46	11	283
Groundnut						
S.B.11	1	1	-	-	-	2
J.L.24	73	11	3	-	-	87
Total	74	12	3	-	-	89
Gram						
Phule G.5	4	8	8	9	9	38
G.1	10	3	5	4		22
N.59	8	12	5	13	5	43
B.D.N.9-3		2	2	2		6
Chaffa	7	19	13	21	1	61
Total	29	44	33	49	15	170

Table 4.27 : Distribution of Fertilizer Minikits by Crop and Size of Land-holding (Rabi Season)

Crop	Size of land-holding (Ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	Number of fertilizer minikits					
Jowar	35 (11.25)	66 (24.81)	35 (18.04)	18 (14.06)	1 (3.70)	155 (16.74)
Wheat	7 (2.25)	1 (0.38)	5 (2.58)	4 (3.12)	0	17 (1.84)
Sunflower	33 (10.61)	23 (8.65)	22 (11.34)	7 (5.47)	1 (3.70)	86 (9.29)
Safflower	60 (19.29)	88 (33.08)	63 (32.47)	33 (25.78)	9 (33.34)	253 (27.32)
Groundnut	46 (14.79)	6 (2.26)	2 (1.03)	0	0	54 (5.83)
Sesamum	0	1 (0.37)	0	0	0	1 (0.11)
Gram	33 (10.61)	56 (21.05)	57 (29.38)	60 (46.87)	16 (59.26)	222 (23.97)
Green gram	1 (0.32)	0	0	0	0	1 (0.11)
Tur	1 (0.32)	2 (0.75)	1 (0.52)	2 (1.56)	0	6 (0.65)
Pea	2 (0.65)	1 (0.37)	1 (0.52)	1 (0.78)	0	5 (0.54)
Kulith	19 (6.12)	5 (1.88)	3 (1.55)	0	0	27 (2.91)
Chavali	21 (6.75)	5 (1.88)	3 (1.54)	0	0	29 (3.13)
Wal	14 (4.50)	5 (1.88)	1 (0.52)	0	0	20 (2.16)
Vegetable crops	3 (0.96)	0	0	1 (0.78)	0	4 (0.43)
All Crops	36 (11.58)	7 (2.63)	1 (0.51)	2 (1.56)	0	46 (4.97)
Total	311 (100.00)	266 (100.00)	194 (100.00)	128 (100.00)	27 (100.00)	926 (100.00)

(Figures in brackets indicate percentages.)

not used in 11 cases in rabi season; this was because the farmer had not received a seed minikit.

If application of fertilizers to different crops is examined (Table 4.27), it is noted that in rabi season cereals received relatively less amount of fertilizers (only about 18 per cent). Safflower (27 per cent) and gram (24 per cent) were the main crops in rabi season that claimed a large proportion of fertilizers distributed through the minikits programme.

4.7 Suggestions by the Beneficiaries

In our questionnaire, we had asked for the suggestions regarding the minikits scheme from the beneficiaries. More than half of the total respondents suggested that the quantity of seeds and fertilizer should be more i.e. the quantity should be sufficient for a larger area. Most of them have suggested that the minikit should be for one acre and not for .10 Ha as is the case. Quite a few of them have suggested that the given minikit is not sufficient even for a plot of .10 Ha. This may be for two reasons. First, the given quantity of seed itself being less than the guaranteed package and second, the recommended seed rate not being maintained by the farmer while sowing the minikit. The second reason requires to be given slightly more attention as it pertains to the improved practices of cultivation. If the seed rate is changed or in other words if the minikits are not sown in the stipulated area, then it affects the plant population in the plot, the dose of the fertilizer changes, and it affects the yields. It is therefore essential for the extension agency to see to it that the area under the minikit is maintained as per the stipulation. From our schedules, we analysed data for area under minikits of all crops. Table 4.28 gives this information. It is evident from the Table that, out of a total 1,108 seed minikits, 721 minikits (65 per cent) were sown in the stipulated area of .10 Ha. However, a considerable number of minikits are sown in 1, 2, 3 ... upto .20 Ha. In kharif season about 32 per cent of the minikits were sown in the area less than what is

Table 4.28 : Distribution of Seed Minikits by Area Under Each Minikit

Area in Ha.	Kharif season		Rabi season	
	No. of minikits sown	Per cent	No.of minikits sown	Per cent
.01	4	0.36	-	-
.02	23	2.08	-	-
.03	29	2.62	-	-
.04	41	3.70	10	0.83
.05	121	10.92	40	3.30
.06	36	3.25	17	1.40
.07	15	1.35	24	1.98
.08	69	6.23	72	5.95
.09	15	1.35	9	0.74
.10	721	65.08	977	80.68
.11	5	0.45	1	0.08
.12	16	1.44	3	0.25
.13	2	0.18	-	-
.15	3	0.27	3	0.25
.16	-	-	4	0.33
.18	-	-	1	0.08
.20	8	0.72	50	4.13
Total	1,108	100.00	1,211*	100.00

* Blank cases excluded.

stipulated and about 3 per cent of the minikits were sown in area more than what is stipulated. In rabi season the corresponding percentages were 14 and 5 respectively. One of the reasons why the cultivators sow their minikits in area less than .10 Ha may be, that they feel that maintaining the recommended seed rate means wastage of land, as some of the beneficiaries pointed out. This indicates that, the V.E.Ws will have to convince the farmers about the seed

rate, plant population and the resultant increase in the yield. Another suggestion made by a considerable number of beneficiaries was that pesticides should also be given along with the seed and fertilizer minikits.

CHAPTER V

MONITORING AND EVALUATION OF PLANT PROTECTION SCHEME

Plant protection schemes have been in operation in India since 1960-61. Since 1974 various campaigns are being organized for plant protection. The object of these schemes is to help control pests, diseases, weeds and minimize losses in yields by undertaking preventive and curative measures. To encourage and support the use of pesticides, subsidy on costs of pesticides supplied in the campaign is offered to the cultivators. Effective application of pesticides is constrained due to non-availability of the necessary appliances. Sprayers and dusters are therefore supplied to the marginal farmers on subsidy.

The scheme of supply of improved appliances and pesticide with 25 per cent subsidy was launched in 1977-78. In 1984-85, subsidy was offered by the Central Government and hence the extent of subsidy was increased to 50 per cent. In addition the farmer is granted Rs. 15 per ha. as operational charge. Subsidy on appliances is given only to marginal farmers and is subject to a maximum of Rs. 250. Information on the consumption of pesticides under Plant Protection Schemes and supply of appliances in Maharashtra is presented in Tables 5.1 and 5.2.

5.1 Monitoring

In kharif season of 1985-86, 389 beneficiaries were covered in the survey. Of these in 30 cases in Ratnagiri district the beneficiaries on the list reportedly did not receive pesticides. In rabi season, of the total 302 families covered, 8 cases were spurious. No family from Ratnagiri and Bhandara districts could be included in the survey during rabi season. The distribution of the sample beneficiaries by size of land-holding is given in Table 5.3. The marginal and small farmers formed respectively

Table 5.1 : Application of Pesticides Under Plant Protection Schemes in Maharashtra State (1984-85)

Name of the pesticide*	Crop								Total
	Jowar	Paddy	Wheat	Tur	Gram	Ground-nut	Other oilseeds	Cotton	
	Quantity of pesticide used								
Liquid Formation in litre									
Phosphamidon 85 E.C.	-	2	-	10628	-	41565	13	11476	63684
Endosulphan 35 E.C.	34380	680	-	47595	2807	786	3648	251214	341110
Quinolphos 25 E.C.	-	-	-	57563	-	2856	7729	800	68948
Dimethoate 30 R.C.	18030	400	-	418	-	3500	-	118190	140538
Monocrotophos 36 W.S.C.	-	-	-	1639	-	1014	-	14125	16778
Malathion 50 E.C.	12000	-	-	-	-	-	-	3002	15002
Phenthoate 50 E.C.	-	-	-	4828	-	-	-	-	4828
Granules, dust in M.T.									
Benzin Hexachloride 10%	1656	85	-	287	13	56	633	neg.	2730
Carbaryl 10%	5	9	-	11	28	5	3	-	61
Quinolphos 5%	-	-	-	-	4	1	270	13000	13275
D.D.T. 5%	-	-	-	-	30	-	-	40223	40253
Fungicide in M.T.									
Sulphur	-	-	-	427	-	7950	neg.	6493	14870
Area covered under Plant Protection Scheme (Ha.)	249180	14022	82565	247552	17705	59251	16302	1544591	2231168
Per cent	11.17	0.63	3.70	11.10	0.79	2.65	0.73	69.23	100.00

* Only the major pesticides used are included in the Table.

Source : Office Records of the Directorate of Agriculture.

Table 5.2 : Distribution of Pesticide Appliances at Subsidised Price in Maharashtra State (1980-1984)

Year	Budget provision (Rs. lakh)	Expenditure incurred (Rs. lakh)	Supply of Plant Protection Appliances			
			Target	Actual supply		Total
				Sprayer	Duster	
1980-81	2.00	1.02		1082	15	1097
1981-82	24.48	12.23	24480	7538	1704	9242
1982-83	27.00	10.64	18900	8625	2128	10753
1983-84	30.00	14.01	17170	8858	1280	10138
1984-85	30.00			11445	2955	14400

Source : Office Records of the Directorate of Agriculture.

about 13 per cent and 29 per cent of the total beneficiaries in kharif season and only 10 per cent and 29 per cent in rabi season. Excluding Beed district where the percentage of small farmers is substantial, the overall percentage of small farmers gets reduced to 14 per cent. A significant number of larger farmers received pesticides on subsidy.

Prompt delivery of pesticide is crucial for its effectivity. The respondents were asked about the lag in the receipt of pesticides after the demand was placed. In Amravati and Beed the delivery was prompt whereas in Bhandara there was a lag in over 60 per cent of the cases in kharif season. (Table 5.4.)

The other crucial factor is the proper and timely advice. Here again there were considerable inter-district variations. (Table 5.5.) In Ratnagiri the implementation machinery seems quite poor. Eighteen out of 25 beneficiaries said that they did not get any advice and the remaining seven reported that they received advice after the crop was pest-infested. There was also a complaint that they were given mainly B.H.C. and the other pesticides received were cornered by the influential members in

Table 5.3 : Districtwise Distribution of Pesticide Beneficiaries by Size of Land-holding (1985-86)

District	Size of land-holding (Ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	Number of beneficiaries					
Kharif Season						
Ratnagiri	18 (78.26)	4 (17.39)	1 (4.35)	-	-	23 (100.00)
Jalgaon	-	7 (11.67)	13 (21.67)	23 (38.33)	17 (28.33)	60 (100.00)
Pune	9 (15.52)	14 (24.14)	20 (34.48)	14 (24.14)	1 (1.72)	58 (100.00)
Satara	9 (14.76)	24 (39.34)	18 (29.51)	10 (16.39)	-	61 (100.00)
Beed	8 (11.94)	44 (65.67)	14 (20.90)	1 (1.49)	-	67 (100.00)
Amravati	3 (5.00)	6 (10.00)	12 (20.00)	25 (41.67)	14 (23.33)	60 (100.00)
Bhandara	1 (3.33)	6 (20.00)	7 (23.33)	15 (50.00)	1 (3.34)	30 (100.00)
Total	48 (13.37)	105 (29.25)	85 (23.68)	88 (24.51)	33 (9.19)	359 (100.00)
Spurious cases	22	7	1	-	-	30*
Rabi Season						
Ratnagiri	-	-	-	-	-	-
Jalgaon	-	-	4 (6.90)	45 (77.59)	9 (15.51)	58 (100.00)
Pune	15 (28.30)	15 (28.30)	15 (28.30)	6 (11.33)	2 (3.77)	53 (100.00)
Satara	2 (3.17)	14 (22.22)	26 (41.27)	16 (25.40)	5 (7.94)	63 (100.00)
Beed	5 (7.69)	51 (78.46)	9 (13.85)	-	-	65 (100.00)
Amravati	6 (10.91)	5 (9.09)	20 (36.36)	18 (32.73)	6 (10.91)	55 (100.00)
Bhandara	-	-	-	-	-	-
Total	28 (9.53)	85 (28.91)	74 (25.17)	85 (28.91)	22 (7.48)	294 (100.00)
Spurious cases	2	1	4	1	-	8@

* All from Ratnagiri district.
@ All from Pune district.

(Figures in brackets indicate percentage to total.)

Table 5.4 : The Lag Between Demand for and Receipt of Pesticide (1985-86)

District	Lag						Total
	No lag	Less than 2 days	3 - 5 days	6 - 15 days	16 - 30 days	Received at sowing time	
	Number of cases						
Kharif Season							
Ratnagiri	2 (28.57)	1 (14.28)	4 (57.15)	-	-	-	7 (100.00)
Jalgaon	19 (27.54)	23 (33.33)	13 (18.84)	11 (15.94)	3 (4.35)	-	69 (100.00)
Pune	10 (27.03)	3 (8.11)	6 (16.21)	10 (27.03)	3 (8.11)	5 (13.51)	37 (100.00)
Satara	34 (61.83)	14 (25.45)	4 (7.27)	3 (5.45)	-	-	55 (100.00)
Beed	52 (77.61)	12 (17.91)	1 (1.49)	2 (2.99)	-	-	67 (100.00)
Amravati	62 (92.54)	3 (4.48)	-	2 (2.99)	-	-	67 (100.00)
Bhandara	-	2 (6.67)	9 (30.00)	19 (63.33)	-	-	30 (100.00)
Total	179 (53.92)	58 (17.47)	37 (11.14)	47 (14.16)	6 (1.81)	5 (1.50)	332 (100.00)
Rabi Season							
Ratnagiri	-	-	-	-	-	-	-
Jalgaon	11 (18.97)	29 (50.00)	15 (25.86)	3 (5.17)	-	-	58 (100.00)
Pune	14 (70.00)	-	2 (10.00)	1 (5.00)	3 (15.00)	-	20 (100.00)
Satara	38 (65.52)	14 (24.14)	2 (3.45)	1 (1.72)	-	3 (5.17)	58 (100.00)
Beed	46 (70.77)	12 (18.46)	2 (3.08)	4 (6.15)	-	1 (1.54)	65 (100.00)
Amravati	38 (69.09)	8 (14.55)	9 (16.36)	-	-	-	55 (100.00)
Bhandara	-	-	-	-	-	-	-
Total	147 (57.42)	63 (24.61)	30 (11.72)	9 (3.52)	3 (1.17)	4 (1.56)	256 (100.00)

(Figures in brackets indicate percentage to total.)

Note: In presenting the data in Tables 5.4 to 5.19 only the reporting cases are taken into consideration, the non-reporting cases are excluded.

Table 5.5 : Districtwise Distribution of Cases of Guidance by Timing During the Crop Cycle (1985-86)

	Ratnagiri	Jalgaon	Pune	Satara	Beed	Amravati	Bhandara	Total
				Number of cases				
Kharif Season								
No guidance received	18 (72.00)	2 (2.90)	3 (5.17)	21 (34.43)	7 (10.29)	-	-	51 (13.49)
Before sowing	-	2 (2.90)	30 (51.72)	1 (1.64)	4 (5.88)	-	13 (43.33)	50 (13.23)
At sowing	-	-	4 (6.90)	-	-	-	-	4 (1.06)
After sowing	-	41 (59.42)	3 (5.17)	3 (4.92)	3 (4.41)	-	-	50 (13.23)
After crop inspection	-	21 (30.43)	4 (6.90)	-	1 (1.47)	-	-	26 (6.88)
After infestation	7 (28.00)	1 (1.45)	7 (12.07)	4 (6.56)	52 (76.47)	-	17 (56.67)	88 (23.28)
At the time of receipt of pesticide	-	2 (2.90)	7 (12.07)	32 (52.45)	1 (1.47)	67 (100.00)	-	109 (28.83)
Total	25* (100.00)	69 (100.00)	58 (100.00)	61 (100.00)	68 (100.00)	67 (100.00)	30 (100.00)	378 (100.00)
Rabi Season								
No guidance received	-	-	20 (54.06)	37 (58.73)	-	1 (1.92)	-	58 (21.48)
Before sowing	-	-	1 (2.70)	-	3 (5.00)	50 (96.16)	-	54 (20.00)
At sowing	-	-	3 (8.11)	-	-	-	-	3 (1.11)
After sowing	-	5 (8.62)	1 (2.70)	2 (3.17)	-	1 (1.92)	-	9 (3.34)
After crop inspection	-	52 (89.66)	-	-	1 (1.67)	-	-	53 (19.63)
After infestation	-	1 (1.72)	1 (2.70)	-	56 (93.33)	-	-	58 (21.48)
At the time of receipt of pesticide	-	-	11 (29.73)	24 (38.10)	-	-	-	35 (12.96)
Total	-	58 (100.00)	37@ (100.00)	63 (100.00)	60 (100.00)	52 (100.00)	-	270 (100.00)

* 30 spurious cases excluded.
@ 8 spurious cases excluded, plus 8 cases omitted were non-reporting.
(Figures in brackets indicate percentage to total.)

Table 5.6 : Districtwise Distribution of Cases Receiving Guidance by Agency (1985-86)

District	Agency giving advice			No advice received	Total
	VEW	VLW	AO		
	Number of cases				
Kharif Season					
Ratnagiri	7 (28.00)	-	-	18 (72.00)	25 (100.00)
Jalgaon	36 (52.17)	31 (44.93)	-	2 (2.90)	69 (100.00)
Pune	42 (72.41)	9 (15.52)	4 (6.90)	3 (5.17)	58 (100.00)
Satara	21 (45.65)	4 (8.70)	-	21 (45.65)	46 (100.00)
Beed	61 (89.71)	-	-	7 (10.29)	68 (100.00)
Amravati	-	65 (100.00)	-	-	65 (100.00)
Bhandara	-	29 (96.67)	1 (3.33)	-	30 (100.00)
Total	167 (46.26)	138 (38.23)	5 (1.38)	51 (14.13)	361 (100.00)
Rabi Season					
Ratnagiri	-	-	-	-	-
Jalgaon	47 (81.03)	-	11 (18.97)	-	58 (100.00)
Pune	22 (41.51)	-	11 (20.75)	20 (37.74)	53 (100.00)
Satara	24 (38.09)	1 (1.59)	1 (1.59)	37 (58.73)	63 (100.00)
Beed	65 (100.00)	-	-	-	65 (100.00)
Amravati	8 (14.54)	45 (81.82)	1 (1.82)	1 (1.82)	55 (100.00)
Bhandara	-	-	-	-	-
Total	166 (56.46)	46 (15.65)	24 (8.16)	58 (19.73)	294 (100.00)

VEW - Village Extension Worker.
VLW - Village Level Worker
AO - Agricultural Officer.
(Figures in brackets indicate percentage to total.)

the village. Advice was mainly given by the VEWs in Beed and Satara districts, while in Amravati and Bhandara districts it was extended by the village level workers (Table 5.6).

Nearly all the beneficiaries except in Satara and Pune district said that they could do spraying and dusting in time. Only in Pune 7 out of 58 cases and Satara 18 out of 61 cases reported that they failed to do spraying in time because they did not receive the pesticides in time.

Thirty — 35 per cent of the sample beneficiaries owned plant protection appliances (Table 5.7). Of those who did not

Table 5.7 : Ownership of Plant Protection Appliances by Size of Land-holding (1985-86)

	Size of land-holding (Ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
Kharif Season						
Number of families owing Plant Protection Appliances	-	14	21	46	26	107
Per cent to total	-	13.33	24.71	52.27	78.79	29.80
Rabi Season						
Number of families owning Plant Protection Appliances	1	7	20	61	18	107
Per cent to total	3.57	8.23	27.03	71.76	81.82	35.20

possess appliances about 40 per cent used rented appliances and the rest applied the pesticides by hand (Table 5.8). Even though appliances are offered under the scheme at subsidized prices the marginal and small farmers rarely are in a position to pay the requisite amount. Both in kharif and rabi seasons none of the marginal farmers took advantage of the scheme and bought any appliances and only a few small farmers obtained appliances at subsidy (Table 5.9).

Table 5.8 : Districtwise Distribution of Cases by Source of Plant Protection Appliances (1985-86)

District	Source				Total
	Other farmers	On hire from Gram Panchayat	Applied by hand or with gunny bag	Did not apply pesticide	
	Number of cases				
Kharif Season					
Ratnagiri	-	-	5 (100.00)	-	5 (100.00)
Jalgaon	-	16 (94.12)	1 (5.88)	-	17 (100.00)
Pune	2 (8.34)	-	22 (91.66)	-	24 (100.00)
Satara	3 (7.14)	25 (59.53)	14 (33.33)	-	42 (100.00)
Beed	-	-	8 (100.00)	-	8 (100.00)
Amravati	-	32 (96.97)	1 (3.03)	-	33 (100.00)
Bhandara	-	20 (86.96)	3 (13.04)	-	23 (100.00)
Total	5 (3.29)	93 (61.18)	54 (35.53)	-	152* (100.00)
Rabi Season					
Ratnagiri	-	-	-	-	-
Jalgaon	-	4 (100.00)	-	-	4 (100.00)
Pune	11 (64.71)	3 (17.65)	3 (17.64)	-	17 (100.00)
Satara	10 (21.74)	22 (47.83)	14 (30.43)	-	46 (100.00)
Beed	-	2 (25.00)	6 (75.00)	-	8 (100.00)
Amravati	8 (29.63)	1 (3.70)	-	18 (66.67)	27 (100.00)
Bhandara	-	-	-	-	-
Total	29 (28.43)	32 (31.37)	23 (22.55)	18 (17.65)	102 (100.00)

(Figures in brackets indicate percentage to total.)

* In the case of 100 non-reporting cases it is presumed that they did not hire appliances.

Table 5.9 : Number of Beneficiaries Obtaining Plant Protection Appliances at Subsidized Price by Size of Land-holding (1985-86)

	Size of land-holding (Ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
Kharif Season						
Number of families obtaining Plant Protection Appliances on subsidy	-	9	11	6	1	27
Per cent to total	-	8.57	12.94	6.82	3.03	7.52
Rabi Season						
Number of families obtaining Plant Protection Appliances on subsidy	-	7	7	4	4	22
Per cent to total	-	8.23	9.46	4.71	18.18	7.48

The suggestions made to improve the effectivity of the Scheme varied from district to district depending upon the problems faced by the beneficiaries. In Ratnagiri and Jalgaon districts the important suggestion was that pesticides other than B.H.C. should be supplied. The respondents put emphasis on timely delivery and need of proper guidance in Amravati and Pune districts. In Beed it was reported that the quantity supplied was not adequate.

5.2 Evaluation

For evaluation study on plant protection scheme it was planned to include in the sample 120 beneficiaries from each of the 7 selected districts. It was possible to achieve this target in all the districts except Ratnagiri district where it was noted that pesticides had not reached the farmers in many villages. The list of beneficiaries used for drawing the sample contained a large number of cases where the listed beneficiaries when contacted reported that they had not received any pesticides. Of the total 105 beneficiaries included in the sample from Ratnagiri district 69

cases were noted to be spurious and in 11 cases the quantity recorded in their name was more than what they reportedly received. In Jalgaon district, 21 spurious cases, in Satara 5 and in Pune 2 spurious cases were recorded (Table 5.10). Thus out of the total of 850 farmers covered in the study 753 were real beneficiaries.

Table 5.10 : Distribution of Pesticide Beneficiaries According to Size of Land-holding (Evaluation Study)

Category of the beneficiaries	Size of land-holding (Ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	Number of beneficiaries					
Received pesticide as recorded	80 (52.63)	238 (91.89)	226 (94.96)	134 (97.10)	61 (96.83)	739 (86.94)
Received pesticide less than recorded quantity	10 (6.58)	4 (1.54)	-	-	-	14 (1.65)
Did not receive pesticide	62 (40.79)	17 (6.56)	12 (5.04)	4 (2.90)	2 (3.17)	97 (11.41)
Total	152 (100.00)	259 (100.00)	238 (100.00)	138 (100.00)	63 (100.00)	850 (100.00)
Actual Beneficiaries	90	242	226	134	61	753
Per cent	11.95	32.14	30.01	17.80	8.10	100.00

(Figures in brackets indicate percentage to total.)

Sample Population: If the communitywise distribution of the beneficiaries is considered it is found that as in other programmes the Scheduled Tribe farmers were totally neglected while the Scheduled Caste farmers were under-represented, particularly in Pune, Satara and Jalgaon districts (Table 5.11). As to the size of land-holding the proportion of beneficiaries among the marginal and small farmers was only about 12 per cent and 32 per cent respectively (Table 5.10). As many as 25 per cent of the beneficiaries were larger farmers (above 4 ha.). Over 60 per cent of the spurious cases were from the category of marginal farmers. In the category of marginal farmers the proportion of spurious

Table 5.11 : Districtwise Distribution of Beneficiaries According to Community (Evaluation Study)

District	Scheduled Castes Beneficiaries	Scheduled Tribes Beneficiaries	Other Beneficiaries	Total
Ratnagiri	11 (10.48)	1 (0.95)	93 (88.57)	105 (100.00)
Jalgaon	6 (4.69)	13 (10.16)	109 (85.16)	128 (100.00)
Pune	1 (0.72)	3 (2.17)	134 (97.11)	138 (100.00)
Satara	3 (2.50)	1 (0.83)	116 (96.67)	120 (100.00)
Beed	11 (9.24)	8 (6.72)	100 (84.04)	119 (100.00)
Amravati	7 (5.88)	9 (7.56)	103 (86.55)	119 (100.00)
Bhandara	12 (9.92)	-	109 (90.08)	121 (100.00)
Total	51 (6.00)	35 (4.12)	764 (89.88)	850 (100.00)

(Figures in brackets indicate percentage to total.)

Table 5.12 : Districtwise Distribution of Beneficiaries According to Size of Land-holding (Evaluation Study)

District	Size of land-holding (Ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
Ratnagiri	85 (55.92)	13 (5.02)	4 (1.68)	2 (1.45)	1 (1.59)	105 (12.35)
Jalgaon	4 (2.63)	18 (6.95)	34 (14.29)	50 (36.23)	22 (34.92)	128 (15.06)
Pune	21 (13.82)	49 (18.92)	37 (15.55)	22 (15.94)	9 (14.29)	138 (16.24)
Satara	12 (7.89)	37 (14.29)	59 (24.79)	12 (8.70)	-	120 (14.11)
Beed	24 (15.79)	74 (28.57)	21 (8.82)		-	119 (14.00)
Amravati	1 (0.66)	26 (10.04)	29 (12.18)	32 (23.19)	31 (49.20)	119 (14.00)
Bhandara	5 (3.29)	42 (16.21)	54 (22.69)	20 (14.49)	-	121 (14.24)
Total	152 (100.00)	259 (100.00)	238 (100.00)	138 (100.00)	63 (100.00)	850 (100.00)

(Figures in brackets indicate percentage to total.)

cases was as high as 40 per cent. It appears that their name was entered on the list of the beneficiaries to show that the target group benefited from the scheme but benefit was actually secured by other farmers who in all likelihood were larger farmers. If this is so then the proportion of beneficiaries among marginal farmers works out only to about 10 per cent.

Guidance: So far as guidance for the application of pesticides is considered, according to the formally recorded response about 84 per cent received guidance; this proportion did not vary systematically over the different land-holding size groups. Guidance was provided by the VEWs in about 35 per cent of the cases, by the Village Level Workers in 30 per cent cases and by Agricultural Officers in 10 per cent cases (Table 5.13). In Bhandara and Beed districts nearly

Table 5.13 : Districtwise Distribution of Pesticide Beneficiaries According to Agency Extending Advice (Evaluation Study)

District	VLW	A.O.	V.D.O.	VEW	Other farmers	Others	Advice not received	Total
Ratnagiri	-	-	-	27 (25.71)	-	-	78 (74.29)	105 (100.00)
Jalgaon	66 (51.56)	8 (6.25)	-	20 (15.63)	1 (0.78)	2 (1.56)	31 (24.22)	128 (100.00)
Pune	16 (11.59)	32 (23.19)	4 (2.90)	61 (44.20)	-	1 (0.72)	24 (17.39)	138 (100.00)
Satara	18 (15.00)	6 (5.00)	-	41 (34.17)	-	-	55 (45.83)	120 (100.00)
Beed	-	2 (1.68)	-	115 (96.64)	-	-	2 (1.68)	119 (100.00)
Amravati	62 (52.10)	13 (10.92)	3 (2.52)	11 (9.24)	12 (10.08)	1 (0.85)	17 (14.29)	119 (100.00)
Bhandara	98 (80.99)	21 (17.36)	-	-	-	-	2 (1.65)	121 (100.00)
Total	260 (30.59)	82 (9.65)	7 (0.82)	275 (32.35)	13 (1.53)	4 (0.47)	209 (24.59)	850 (100.00)

(Figures in brackets indicate percentage to total.)

VLW = Village Level Worker
AO = Agricultural Officer
VDO = Village Development Officer
VEW = Village Extension Worker

cent per cent sample beneficiaries received guidance, whereas in Satara district 46 per cent and in Amravati 25 per cent of the beneficiaries complained about lack of guidance. As noted earlier in Ratnagiri district there were a large number of spurious cases. Thus there are considerable variations in the efficiency of implementation of the scheme between different district and special care will have to be taken to improve field-level operations in the above-mentioned districts.

Type of Pesticides Distributed: B.H.C. was the main pesticide supplied (52 per cent cases). The other pesticides like Endosulfan, Phosphamidon, Quinalphos, Carbaryl, Phorate were received in relatively smaller quantities. As noted earlier the beneficiaries complained that even if other pesticides were received they were cornered by a privileged few and a large number of beneficiaries received only B.H.C. This was so particularly in Pune district and also in Satara, Beed and Ratnagiri districts. B.H.C. and Endosalfan were applied to all the crops, Phorate to rice, Phosphamidon mainly to groundnut, Quinalphos to groundnut and tur (Tables 5.14 and 5.15). The recommendations regarding the type of pesticides to be used for different crops were thus more or less followed, if the appropriate pesticides were received. Else only B.H.C. was used.

Table 5.14 : Cropwise Application of Different Pesticides (Evaluation Study)

Crop	Pesticides							Total
	B.H.C.	Carb-aryl	Phospha-midon	Endo-sulphan	Pho-rate	Quinol-phos	Others	
	Number of cases							
Jowar	187	1	1	11	-	1	10	211
Rice	53	-	-	11	63	-	52	179
Groundnut	109	35	63	9	-	22	26	264
Tur	65	4	3	21	-	12	8	113
Gram	73	3	1	9	-	3	14	103
Safflower	3	-	-	-	-	-	-	3
Total	490	43	68	61	63	38	110	873

Table 5.15 : Districtwise Distribution of Pesticide Beneficiaries by Type of Pesticide Received (Evaluation Study)

Name of the pesticide	Ratna-giri	Jal-gaon	Pune	Satara	Beed	Amra-vati	Bhan-dara	Total
	Per cent beneficiaries							
B.H.C.10% D.	74.00	31.43	92.13	82.68	79.17	10.53	21.47	52.54
Carbaryl 10% D.	-	36.00	-	-	-	4.61	-	7.25
Phorate 10% G.	-	-	-	-	-	-	38.65	6.53
Endosulfan 35 E.C.	-	0.57	-	2.36	10.00	29.61	7.98	7.67
Phosphamidon 85 E.C.	-	10.29	-	13.39	5.00	25.66	-	8.29
Quinolphos 25 E.C.	-	13.71	-	-	-	15.79	-	4.97
Phenthoate 50 E.C.	6.00	-	-	-	-	-	7.36	1.55
Other pesticides	20.00	8.00	7.87	1.57	5.83	13.80	24.54	11.20
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Pesticides were applied at the flowering time in about 58 per cent of the cases, in 13 per cent of the cases at the time of seed formation, at both these times in about 23 per cent of the cases. Spraying was reportedly completed before the attack of the pests in all the districts except Amravati where in about 20 per cent of the cases the pesticides were applied after the pest attack (Table 5.16). This was due to (a) non-receipt of pesticide in time, (b) inability to anticipate possible pest attack. The pesticide supplied was reported to be inadequate in a large number of cases and additional pesticides were purchased by over 80 per cent of the families in all districts except Beed, where very few families reported additional purchases. This was partly because of the lack of knowledge about pesticide application. Of the total beneficiaries who did not buy additional pesticide, financial constraint and lack of knowledge were the main reasons reported.

Table 5.16 : Districtwise Distribution of Cases by Timing of Application of Pesticide

District	Application of pesticide at the time of					Total
	Sowing	Seed formation	Flowering	2 + 3	After pest-infestation	
	(1)	(2)	(3)	(4)	(5)	
Ratnagiri	-	24 (63.16)	14 (36.84)	-	-	38 (100.00)
Jalgaon	-	4 (3.81)	42 (40.00)	58 (55.24)	1 (0.95)	105 (100.00)
Pune	14 (8.19)	11 (6.43)	92 (53.80)	54 (31.58)	-	171 (100.00)
Satara	7 (5.60)	40 (32.00)	15 (12.00)	63 (50.40)	-	125 (100.00)
Beed	-	7 (5.83)	109 (90.83)	-	4 (3.33)	120 (100.00)
Amravati	-	15 (9.93)	101 (66.89)	7 (4.64)	28 (18.54)	151 (100.00)
Bhandara	-	13 (8.12)	132 (82.50)	15 (9.38)	-	160 (100.00)
Total	21 (2.41)	114 (13.10)	505 (58.05)	197 (22.64)	33 (3.80)	870 (100.00)

(Figures in brackets indicate percentage to total.)

About 85 per cent of the beneficiaries reported that they had maintained the recommended dose in applying pesticides. Of those who failed to do so the main reason (in 51 per cent cases) was the lack of proper guidance and such cases were numerous in Amravati district. The other reasons were (i) quantity supplied was inadequate, (ii) appropriate quantity was decided on the basis of experience.

Plant Protection Appliances: Plant protection appliances were available with only about one-third of the total beneficiaries (Table 5.17). This proportion was very low in Pune district (6 per cent) and it was about 20 per cent in Satara and Beed districts. About 55 per cent of the farmers who did not have appliances used

Table 5.17 : Number of Beneficiaries Owning Plant Protection Appliances by District (Evaluation Study)

	District						
	Ratna-giri	Jalgaon	Pune	Satara	Beed	Amra-vati	Bhan-dara
Number owning plant protection appliances	5	66	8	27	24	51	76
Total Beneficiaries	36	107	136	115	119	119	121
Percentage to total	13.90	61.70	5.90	23.50	20.20	42.90	62.80

Table 5.18 : Districtwise Distribution of Cases by Source of Plant Protection Appliance (Evaluation Study)

District	Appliances on rental basis from Gram Panchayat	Other farmers	Hand applica-tion	Use Gunny sack	Total
	Number of cases				
Ratnagiri	9 (36.00)	-	13 (52.00)	3 (12.00)	25 (100.00)
Jalgaon	22 (68.75)	5 (15.62)	3 (9.38)	2 (6.25)	32 (100.00)
Pune	29 (24.17)	2 (1.67)	22 (18.33)	67 (55.83)	120 (100.00)
Satara	80 (91.95)	4 (4.60)	1 (1.15)	2 (2.30)	87 (100.00)
Beed	28 (29.47)	1 (1.05)	25 (26.32)	41 (43.16)	95 (100.00)
Amravati	58 (87.88)	7 (10.61)	1 (1.51)	-	66 (100.00)
Bhandara	27 (93.10)	2 (6.90)	-	-	29 (100.00)
Total	253 (55.73)	21 (4.62)	65 (14.32)	115 (25.33)	454 (100.00)

(Figures in brackets indicate percentage to total.)

the appliances supplied by Gram Panchayat on rental basis, 5 per cent had taken the appliances from other farmers and 25 per cent used gunny sack to apply the pesticide (Table 5.18). The number of families who had bought appliances on subsidy constituted about one-fifth of the total beneficiaries in Beed and Amravati districts and were negligible in other districts. In the total sample about eight per cent obtained appliances on subsidy.

Ninety-five per cent of the marginal farmers did not own any appliances; the corresponding proportion for small farmers was 79 per cent (Table 5.19). Even among the medium farmers 60 per cent did not possess any appliances. The effectivity of pesticide application is bound to suffer when the necessary appliances are not available. Despite the provision for supply of appliances on subsidy hardly any of the marginal farmers received benefit of the scheme. The farmers said that they are not in a position to mobilize the necessary funds and take advantage of the subsidy.

Table 5.19 : Number of Beneficiaries Owning Plant Protection Appliance by Size of Land-holding (Evaluation Study)

	Size of land-holding (Ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
Number owning plant protection appliances	4	50	89	74	40	257
Total beneficiaries	90	242	226	134	61	753
Percentage to total	4.40	20.70	39.40	55.20	65.60	34.10

The beneficiaries were asked their opinion regarding the benefits of using sprayers and dusters for application of pesticides. There were four main reasons given by the respondents: (1) Effective application of pesticides, (2) Convenience in application, (3) Saving of time, (4) Prompt, timely application. About 40 per cent mentioned saving of time as the main benefit and about

25 per cent each reported effectivity and convenience as the main advantage of using appliances.

Continuation of Pesticide Application: In the total sample nearly 80 per cent of the farmers said that they are continuing application of pesticides. This proportion was over 90 per cent in all the districts excepting Beed and Ratnagiri. In Ratnagiri district the number of actual beneficiaries in the sample was small and the reporting cases were few. Of the 16 reporting cases, 11 said that they are continuing the use of pesticides. In Beed district 90 per cent of the respondents said that they are not continuing the use of pesticides. This was mainly because of their weak economic position. In Beed district the proportion of marginal and small farmers among the sample beneficiaries was markedly higher as compared to their share among the total sample beneficiaries.

Suggestions regarding improvement in the operation of the Scheme were offered by a few beneficiaries. The main suggestion was that pesticides should be supplied in time. The other suggestions were (a) proper guidance should be provided, (b) pesticides other than B.H.C. should be supplied, (c) quantity of pesticides supplied should be increased, and it should be given in adequate dose.

CHAPTER VI

EVALUATION OF CENTRAL SECTOR SCHEME FOR DISTRIBUTION OF MINIKITS UNDER PULSES DEVELOPMENT PROGRAMME IN MAHARASHTRA

6.1 Aims and Nature of the Programme

In order to increase production and to raise the level of productivity of pulses, as well as to bring in additional area under pulses in the pulses growing States of India, the Centre has sponsored a project consisting of two schemes: (i) Centrally Sponsored Scheme for the development of pulses including summer green gram production programme, and (ii) Central Sector Scheme for distribution of minikits under pulses development programme in the pulses growing States of India since 1981-82 with the following objectives:

1. Identification and popularization of promising, pre-release/newly released, varieties/hybrids/ composites and improved varieties of pulses through farmer's participation.
2. Popularization of location specific/high yielding varieties in problem areas on an intensive scale.
3. Building up stocks of improved seed at the farmer's level.
4. Speeding up the adoption of superior varieties/hybrids/composites.
5. Quick diffusion of improved technology along with new seeds made available to the farmers.
6. Bringing more areas under cash crops/multiple cropping/intercropping and crop substitution.
7. Acquainting the extension worker with the new varieties/hybrids before they are actually released and feed back information to the researchers for further improvement of the varieties.

The project is wholly financially assisted by the Central Government.

The total production of pulses in India in 1981-82 was 11.35 million tonnes. It must be noted that the production of pulses has been stagnant since 1955-56; the total production in

that year was about 11 million tonnes. The Seventh Five Year Plan envisages a production level of 17 million tonnes in the terminal year of the Plan. The target for the first year of the Plan, namely 1985-86 has been set at 13.5 million tonnes. The task set is thus quite ambitious.

To achieve the targets of the Seventh Plan, the following strategy has been proposed:

1. Introduction of pulses crops in irrigated farming systems.
2. Bringing of additional area under: (a) short duration varieties of black gram and green grams in rice fallows by utilizing the residual moisture in rabi season, (b) in summer season with irrigation take pulses after oilseeds, sugarcane, potatoes and wheat crop.
3. Inter-cropping of tur in soyabean, bajra, cotton, sugarcane and groundnut both under irrigated and under unirrigated conditions.
4. Multiplication and use of improved pulses seeds.
5. Adoption of plant protection measures.
6. Use of phosphatic fertilizers and rhizobium culture.
7. Improved post-harvest technology.
8. Pulses policies including pricing and marketing of pulses.
9. Organization of pulse crop village in various blocks both in irrigated and rainfed areas in order to promote an integrated approach to the production, procurement and marketing of pulse crops based on the best available know-how.

In order to achieve the envisaged strategy during the Seventh Plan in order to promote pulse development programme, under the Central Sector Scheme, it was proposed to distribute 4.0 lakh minikits for kharif and rabi seasons of 1985-86. Under this programme, seed packets of improved varieties along with rhizobium culture are distributed free of cost to the farmers. The size of the minikits was planned to 2 kgs. to cover an area of 0.1 ha. Each kit contained pulses seed, a packet of rhizobium culture, recommended package of practices printed in Hindi/English or local language of the State to be followed by the farmers.

The Ministry fixes the rate for each minikit packet; in 1984-85 it was Rs. 20 including cost of fungicide treated seed, rhizobium culture packet, printed leaflet, cloth bag, packing and transportation charges upto the point of distribution and other charges, if any.

During the period between 1982-83 and 1984-85, the minikits were prepared by the National Seeds Corporation and other concerned agencies on the basis of the order put by Krishi Mantralaya, and were sent to the Office of the Director of Agriculture of the concerned States. To ensure timely supply of pulse minikits to the farmers and proper evaluation of the performance of new and short duration varieties, it was decided by the Central Government that the preparation of pulses minikits would be done by the Director of Agriculture of the concerned States departmentally or through State Seed Corporation/SFCI/NSC, New Delhi and other concerned agencies from 1985-86. In this connection, it was also requested by the Director, Directorate of Pulses Development Office, Lucknow to place orders and obtain seeds of appropriate varieties from the concerned organizations on payment. Director, Directorate of Pulses was to reimburse the cost of the minikits on receipt of reimbursement claims/bills from the State Government.

Simultaneously, request was made to NSC/SFCI and other concerned agencies to supply seeds of kharif pulses reserved for pulse minikits to the Director of Agriculture of the concerned States on their request directly on payment and a copy of the letter was forwarded for information and necessary action to the Joint Commissioner (Pulses), Government of India, Ministry of Agriculture, New Delhi.

As rhizobium culture was also to be supplied along with each minikit, the Director of Agriculture was requested to arrange good quality ISI marked rhizobium culture.

The programme of distribution is to be formulated by the minikit programme committee at the State level under the

chairmanship of the Director of Agriculture. The representatives of the Agricultural Universities/National/State Seeds Farms and ICAR institutions located in the States are to be nominated for this committee. The Director, Directorate of Pulses Development, Lucknow provides guidelines regarding varieties, number of kits, etc., to this committee. The programme is based on the availability of funds from the Government of India as well as on the availability of seeds.

The Director of Agriculture have been requested to give priority consideration to the following points:

1) Large coverage of marginal, small, Scheduled Tribes and Scheduled Caste farmers in minikit distribution.

2) Popularizing inter-cropping practices.

3) Replacement of traditional low yield crops by the high yielding varieties.

4) Replacement of long duration varieties by short duration varieties.

5) Every year new farmers are expected to be inducted in the programme. Timely distribution of kits and selection of farmers in advance is essential for the success of the programme.

The target set by the Maharashtra State in kharif season of 1985-86 was 40,000 minikits of tur, green gram and black gram each. The achievement was, however, considerably below the targeted quantum* because the targeted number of minikits could not be procured. Varietywise distribution of the minikits of various pulses distributed in 1985-86 is given in Table 6.1.

To examine how effectively the NPD Programme is being implemented in Maharashtra, whether various stipulations are being properly followed and to assess the impact of the programme on area under pulses and productivity of pulses, a sample study of the beneficiaries was taken up.

6.2 The Sample Survey

Separate sample was not drawn for the study of NPD Programme. The families included in the monitoring study of minikit distribution scheme in kharif and rabi season were covered through a

* Only 42,670 minikits of pulses were distributed under NPDP as against 1,73,119 targeted minikits.

Table 6.1 : Pulses Minikits Distributed in Maharashtra under National Pulses Development Programme According to Varieties (1985-86)

Crop	Variety	Target	Minikits distributed	Size of kit	Cost of one unit (Rs.)	Value (Rs. lakh)
Kharif						
Tur	BDN II	40,000	1,950	2 kg	16.00	0.31
Moog	Kopargaon	40,000	10,788	1 kg	8.00	0.86
Udid	-	40,000	-	1 kg	8.00	-
Ghevada	Contender	1,119	1,119	2 kg	32.00	0.36
Total		1,21,119	13,857			1.53
Rabi						
Tur	C11	5,000	4,000	2 kg	17.00	0.68
Gram	G1	9,000	8,188)			
	BDN-9-3	5,000	4,499)	5 kg	35.25	8.24
	N-59	5,000	4,270)			
	Chaffa	7,000	6,915)			
Total		31,000	27,872			8.92
Summer						
Moog	PV	20,000	-	1 kg	-	-
Ghevda	Contender	1,000	1,000	2 kg	-	0.31
Total		21,000	1,000			0.31
Grand Total		1,73,119	42,729			10.76

separate schedule, if they had received pulses minikit under the NPD Programme. The number of families included in the study of NPD Programme varied greatly from district to district as the spread of NPD Programme in different districts is rather uneven. In kharif season 167 families were included in the survey; there were only 16 families from Pune district while the number of families covered from Satara district was 42. In rabi season 245 families were covered. Of these, 80 beneficiaries came from Ratnagiri district, 68 from Jalgaon district and 46 from Amravati district. The number of families covered from Pune, Satara and

Beed districts was small (15 to 20). In kharif season no family was included from Ratnagiri district and in rabi season none was covered from Bhandara district.

Because of such uneven districtwise coverage and small number of families covered from certain districts, district level data are not presented in tabular form. However, if there are significant differences they are discussed in the text.

Composition of Sample Population: Firstly, the community-wise and landholding sizewise representation will be examined (Tables 6.2 to 6.4). It will be seen that in both the seasons the Scheduled Tribes were neglected (about 2 to 3 per cent representation) and the proportion of the Scheduled Castes in the total sample beneficiaries was about the same as among total male cultivators. There were considerable variations in this regard between the districts.

Table 6.2 : Districtwise Distribution of NPDP Beneficiaries according to Community

District	Kharif season		Rabi season	
	Scheduled Castes	Scheduled Tribes	Scheduled Castes	Scheduled Tribes
	Number of NPDP beneficiaries			
Ratnagiri	-	-	4 (5.06)	-
Jalgaon	2 (8.70)	2 (8.70)	-	4 (5.88)
Pune	-	-	3 (17.65)	-
Satara	8 (19.05)	-	2 (10.53)	2 (10.53)
Beed	2 (10.00)	1 (5.00)	5 (33.33)	2 (13.33)
Amravati	2 (5.55)	1 (2.78)	9 (19.57)	-
Bhandara	2 (6.67)	-	-	-
Total	16 (9.58)	4 (2.40)	23 (9.39)	8 (3.26)

(Figures in brackets indicate percentages.)

Table 6.3 : Districtwise Distribution of NPDP Beneficiaries according to Size of Land-holding (Kharif Season)

District	Size of land-holding (Ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	Number of beneficiaries					
Jalgaon	10 (43.48)	6 (26.08)	5 (21.74)	1 (4.35)	1 (4.35)	23 (100.00)
Pune	5 (31.25)	4 (25.00)	6 (37.50)	-	1 (6.25)	16 (100.00)
Satara	10 (23.81)	22 (52.38)	7 (16.67)	3 (7.14)	-	42 (100.00)
Beed	7 (35.00)	7 (35.00)	5 (25.00)	1 (5.00)	-	20 (100.00)
Amravati	9 (25.00)	12 (33.33)	7 (19.44)	2 (5.56)	6 (16.67)	36 (100.00)
Bhandara	19 (63.33)	10 (33.33)	1 (3.34)	-	-	30 (100.00)
Total	60 (35.93)	61 (36.53)	31 (18.56)	7 (4.19)	8 (4.79)	167 (100.00)

(Figures in brackets indicate percentages.)

Table 6.4 : Districtwise Distribution of NPDP Beneficiaries according to Size of Land-holding (Rabi Season)

District	Size of land-holding (Ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	Number of beneficiaries					
Ratnagiri	62 (77.50)	14 (17.50)	3 (3.75)	1 (1.25)	-	80 (100.00)
Jalgaon	2 (2.94)	6 (8.82)	20 (29.41)	30 (44.12)	10 (14.71)	68 (100.00)
Pune	3 (17.65)	3 (17.65)	5 (29.41)	6 (35.29)	-	17 (100.00)
Satara	-	6 (31.58)	10 (52.63)	3 (15.79)	-	19 (100.00)
Beed	5 (33.33)	8 (53.33)	2 (13.34)	-	-	15 (100.00)
Amravati	7 (15.22)	15 (32.62)	6 (13.04)	13 (28.26)	5 (10.86)	46 (100.00)
Bhandara	-	-	-	-	-	-
Total	79 (32.24)	52 (21.23)	46 (18.78)	53 (21.63)	15 (6.12)	245 (100.00)

(Figures in brackets indicate percentages.)

The marginal and small farmers formed about 35.9 per cent and 36.5 per cent of the total sample beneficiaries in kharif season, the corresponding proportion in rabi season was 32.2 per cent and 21.2 per cent respectively. They were underrepresented in Pune, Satara and Jalgaon districts and well-represented in Ratnagiri and Beed districts.

Composition of Pulses Minikits: The composition of pulses minikits received by the sample families is shown in Table 6.5. In kharif season, tur was the main crop (66.7 per cent minikits), the other pulses being green gram, black gram and ghevada. In rabi season over 50 per cent of the minikits received were of gram, the other important pulses being kulith, chavali and wal. Most of the minikits were given as independent crop. In kharif season, of the total 110 tur minikits 97 were given as independent and only 13 as intercrop. In the total reporting cases about 8 per cent minikits were given as intercrop. In rabi season no minikit was given as intercrop. The stipulation that emphasis should be placed on intercropping has not been achieved in 1985-86.

Pulses minikits were grown under rainfed conditions in nearly 90 per cent of the cases in kharif season while in rabi season it was taken as an irrigated crop in about 70 per cent of the cases (Table 6.6).

Operational Aspects of NPDP: (a) The quantity of seed in a minikit is so adjusted that it is adequate for sowing 0.10 hectare of land. It was, however, noted in the survey that in 20 per cent of the cases the area was less than .10 Ha in kharif season and the corresponding percentage in rabi season was nearly 45 per cent (Table 6.7). Over 60 per cent of the minikits in the case of kulith and chavali, and almost all the minikits in the case of wal were sown in an area less than .05 ha. The farmers opined that the seed was adequate only for that much area. Hence if the Government stipulations regarding seed rate are to be followed, considerable extension work is necessary.

Table 6.5 : Distribution of Pulses Minikits Distributed Under NPDP according to Crop and Size of Land-holding

Crop	Size of land-holding (Ha.)					Total minikits	Per cent minikits
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10		
	Number of pulses minikits						
Kharif Season							
Tur	36 (32.73)	44 (40.00)	20 (18.18)	5 (4.55)	5 (4.54)	110 (100.00)	66.67
Green gram	14 (51.85)	7 (25.93)	4 (14.81)	-	2 (7.41)	27 (100.00)	16.36
Black gram	9 (42.86)	6 (28.57)	4 (19.05)	1 (4.76)	1 (4.76)	21 (100.00)	12.73
Ghevada	1 (14.29)	3 (42.86)	2 (28.57)	1 (14.28)	-	7 (100.00)	4.24
Total	60 (36.36)	60 (36.36)	30 (18.18)	7 (4.25)	8 (4.85)	165 (100.00)	100.00
Rabi Season							
Gram	19 (12.02)	37 (23.42)	40 (25.32)	47 (29.75)	15 (9.49)	158 (100.00)	51.46
Tur	-	1 (33.33)	1 (33.33)	1 (33.34)	-	3 (100.00)	0.98
Kulith	37 (74.00)	10 (20.00)	2 (4.00)	1 (2.00)	-	50 (100.00)	16.29
Chavali	40 (76.93)	8 (15.38)	3 (5.77)	1 (1.92)	-	52 (100.00)	16.94
Wal	24 (77.42)	4 (12.90)	2 (6.45)	1 (3.23)	-	31 (100.00)	10.10
Peas	6 (46.16)	1 (7.69)	2 (15.38)	4 (30.77)	-	13 (100.00)	4.23
Total	126	61	50	55	15	307	100.00
Per cent	(41.04)	(19.87)	(16.29)	(17.92)	(4.88)	(100.00)	

(Figures in brackets indicate percentages to total minikits of each crop.)

Table 6.6 : Proportion of Pulse Minikits Distributed Under NPDP Grown as Irrigated Crop

Crop	Minikits irrigated	Total minikits	Per cent irrigated.
Kharif Season			
Tur	8	106	7.55
Green gram	4	27	14.81
Black gram	5	20	25.00
Ghevada	2	7	28.57
Total	19	160	11.87
Rabi Season			
Gram	73	157	46.50
Tur	-	3	Nil
Kulith	50	50	100.00
Chavali	50	52	96.15
Wal	31	31	100.00
Peas	11	13	84.62
Total	215	306	70.26

Table 6.7 : Area Sown Under Pulse Minikits Distributed Under NPDP

Crop	Area sown under pulses (in Ha.)				Total
	.01 - .05	.06 - .09	0.10	0.11 and above	
	Number of minikits				
Kharif Season					
Tur	7	10	92	1	110
Green gram	3	5	18	1	27
Black gram	2	4	14	1	21
Ghevada	1	3	3	-	7
Total	13	22	128	3	165
Per cent	7.88	13.33	76.97	1.82	100.00
Rabi Season					
Gram	2	10	144	2	158
Tur	1	1	1	-	3
Kulith	38	10	1	1	50
Chavali	33	11	8	-	52
Wal	29	1	1	-	31
Peas	-	3	9	1	13
Total	103	36	164	4	307
Per cent	33.55	11.73	53.42	1.30	100.00

(b) As regards the varietywise distribution, it may be noted that there was some discrepancy vis-a-vis the recommendations made by the State Agricultural Department regarding the varieties that are best suited to a particular agro-climatic region. For example, No. 59 variety of gram suited to Marathwada was distributed in Amravati; Kopargaon variety of green gram suited to Vidarbha districts was given in Satara and Pune districts (Table 6.8). Most of the other varieties like BDN2 of tur or Chafa of gram or T9 of black gram are reported to be suitable to all the districts of Maharashtra. These were distributed in most of the districts included in the present study. The present survey was limited only to seven districts and the cases covered in the study are limited. It is, therefore, difficult to assess the extent of mismatch between recommendations and actual distribution on the basis of the survey data. The findings, however, point to the need of taking special care for ensuring that appropriate varieties are distributed keeping in view the local agro-climatic conditions.

(c) Most of the beneficiaries reported that they had not received pulse-seed minikit earlier. In about 12 to 15 per cent of the cases the beneficiaries were repeat cases. Such cases were rather large (about half) in Beed district in kharif season.

Utilization of Produce Grown Under NPDP: The beneficiaries were requested to indicate whether they plan to increase the area under pulses. The response was very positive for all the pulses. It will be instructive to examine whether seed has been saved by the beneficiaries for the next season (Table 6.9). As per reported figures they had saved adequate quantity of seed for resowing. It was noted that about 15 to 30 per cent of the produce was saved as seed; about 30 and 40 per cent of the produce was sold in the case of tur and gram respectively, and the rest was used mainly for home consumption. The quantity consumed at home was 60 per cent or more in the case of kulith, chavali, wal and green gram.

Table 6.8 : Varietywise Distribution of Pulse Minikits Supplied Under NPDP

Crop and variety		Ratnagiri	Jalgaon	Pune	Satara	Beed	Amravati	Bhandara	Total
				Number of minikits					
A) Kharif Season									
Tur	BDN2	-	12	7	17	16	27	18	97
	C-11	-	-	-	-	-	1	12	13
	Total	-	12	7	17	16	28	30	110
Green gram	S.8	-	1	1	-	1	1	-	4
	J-781	-	1	-	-	-	-	-	1
	Kopargaon	-	0	4	9	-	2	-	15
	Vaishakhi	-	-	-	-	-	2	-	2
	T.A.P.7	-	1	-	-	3	-	-	4
	TOTAL	-	3	5	9	4	5	-	26
Black gram	T9	-	7	4	8	-	2	-	21
Ghevda	Contender	-	-	-	7	-	-	-	7
		-							
		-							
Total		-	22	16	41	20	35	30	164
B) Rabi Season									
Gram	Phule G-5	-	29	1	-	3	-	-	33
	G-1	-	-	9	4	-	-	-	13
	N.59	-	-	-	-	-	40	-	40
	BDN-9-3	-	-	-	2	-	3	-	5
	Chafa	2	21	4	10	12	-	-	49
	TOTAL	2	50	14	16	15	43	-	140
Tur	C-11	-	-	-	-	-	3	-	3
Kulith		50	-	-	-	-	-	-	50
Chavali		52	-	-	-	-	-	-	52
Wal (Kadwa)	Konkan	27	-	-	-	-	-	-	27
Peas		6	-	3	3	-	-	-	12
Total		137	50	17	19	15	46	-	284

Note: Certain varieties reported as distributed under NPDP might have been given under the State minikits programme.

Information about the increase in area under pulses in the last few years was sought in the questionnaire. It was noted that in the rabi season only 48 out of 167 beneficiaries responded to this question. Of these, in 18 cases it was reported that the area under pulses has been increased; in six of these cases, this was because they secured a seed minikit again and in the rest of the

Table 6.9 : Utilization of Pulses Produced Under NPDP

Crop	Saved as seed	Sold as seed	Sold	Home consumption	Total
	Per cent utilization of produce				
Kharif Season					
Tur	14.64	2.26	29.04	52.68	100 = 5,300 kg
Green gram	13.09	-	19.49	63.52	100 = 1,283 kg
Black gram	13.84	-	40.49	45.67	100 = 1,062 kg
Ghevada	32.05	7.69	42.31	14.10	100 = 390 kg
Rabi Season					
Gram	22.74	0.37	38.00	39.29	100 = 11,007 kg
Kulith	28.31	2.60	2.60	66.49	100 = 385 kg
Chavali	29.14	1.08	9.09	58.87	100 = 462 kg
Wal	35.75	-	1.04	63.21	100 = 193 kg
Peas	46.38	2.90	15.94	40.58	100 = 385 kg

cases, because they found the crop profitable. In rabi season 76 out of the total 245 beneficiaries covered in the survey responded; 49 of these said that they have increased the area; this was because of receipt of seed minikit in 23 cases and profitability of the crop in the remaining cases.

Profitability of Pulse Minikit: The beneficiaries were requested to indicate whether they found the seed minikits supplied under NPDP profitable and the reasons for the same. In kharif season, about 90 per cent of the families reported that they found the improved varieties profitable and the main reason given was higher yield of new varieties. The seed minikits were reported to be non-profitable in 20 cases. The main reason for non-profitability was low yields due to inadequacy of rain (6 cases), hail storm (3 cases) and pests. In rabi season, 78 minikits or 25 per cent of the total pulse seed minikit were reported to be non-profitable. The reasons for low yield were hail storm and

Table 6.10 : Reasons for Finding Pulse Minikits Non-profitable by Crop

Crop	Reasons for finding pulse minikits non-profitable					Percentage to total pulse minikits
	Low yield	Bird/ animal menace	Water problem	Low germination	Total	
	Number of minikits					
Kharif Season						
Tur	4	-	-	-	4	14.8
Green gram	-	-	-	-	-	-
Black gram	5	6	-	-	11	9.9
Ghevada	3	-	1	1	5	23.8
Total	12	6	1	1	20	12.0
Rabi Season						
Gram	3	10	1	-	14	8.9
Tur	1	1	-	-	2	66.7
Kulith	6	12	5	2	25	50.0
Chavali	5	12	3	1	21	40.4
Wal	3	5	2	1	11	35.5
Peas	2	2	-	1	5	38.5
Total	20	42	11	5	78	25.4

Table 6.11 : Average Yield of Pulses Grown Under NPD Programme

Crop	Average yield in kg per Ha.	
	NPDP Sample Study	Maharashtra State *
Kharif Season		
Tur	560	551
Green gram	567	303
Black gram	680	395
Ghevada	750	N.A.
Rabi Season		
Gram	820	328
Tur	-	-
Kulith	318	197
Chavali	294	318
Wal	428	304
Peas	472	340

* Average for the years 1977-78 and 1978-79; detailed information for later years is not available.

Source: Season and Crop Report, Maharashtra State.

inadequacy of rains. Bird and animal menace resulted in the loss of crop in the case of 42 minimits. The cultivation was not profitable in a sizable number of minikits in the case of peas, kulith, chavali and wal.

Information regarding the estimated production of the plots put to pulse seed minikit was sought in the schedule. As noted earlier, it was difficult for the respondents to give the figures of production, as these plots were seldom harvested separately. The figures given by them reflect their impressionistic judgement. The average yield worked out on the basis of reported production are presented in Table 6.11. The reported average yield is comparable with the overall State level average in the case of tur while it is higher in the case of gram which was reported to be irrigated in nearly 50 per cent of the cases while at the State level the corresponding percentage is only about 16 per cent.

Gram and tur were the two major pulses for which minikits were distributed under NPDP. In the case of other pulses like green gram, black gram and wal, the yield levels reported by the beneficiaries were higher than the State level averages, while in the case of chavali no improvement in yield was noted. The performance as reported by the beneficiaries particularly in the case of black gram, green gram and gram appears quite encouraging. It is essential to collect firm data on this aspect through crop-cutting experiments. So far as tur is concerned the results do not appear encouraging and detailed investigations into the causes for the relatively poor response of tur need to be taken up.

CHAPTER VII

MONITORING AND EVALUATION OF THE SCHEME FOR POPULARIZATION OF IMPROVED AGRICULTURAL IMPLEMENTS

It is common observation that a large section of the farmers, especially marginal and small farmers continue to use the traditional implements and tools that may not be appropriate for the proper application of modern inputs like fertilizers. In addition, they do not possess the necessary equipment for applying new inputs like pesticides. Especially after the introduction of Training and Visit system of extension in the State, a major constraint identified in adopting modern agronomic practices was the lack of improved agricultural implements with the farmers. Relevance of improved agricultural implements is all the more pronounced for dry land farming predominant in the State, where the farmers are required to switch over quickly from one crop to other depending upon the behaviour of the monsoon. It was found that one of the major constraints in popularizing improved implements is the unsound economic condition of the farmers which does not permit them to buy the improved implements. Therefore, for popularizing the use of improved implements on a large scale, it was felt that the farmers should be provided with some encouragement in the form of subsidy to enable them to purchase the improved implements. Accordingly, a scheme for Popularization of Improved Agricultural Implements, particularly for dry-land farming, was launched in the State of Maharashtra in May 1983. Under this scheme subsidy is granted to marginal and small farmers on the lines of subsidy contemplated under the Integrated Rural Development Programme viz., 33⅓ per cent subsidy to marginal farmers and 25 per cent to small farmers for the purchase of the following agricultural implements:
(i) Iron plough (light/medium), (ii) Straight blade harrow, (iii) Leveller, (iv) Seed-cum-fertilizer drill, (v) Blade hoe dryland

weeder, (vi) Rice weeder, (vii) Serrated sickle, (viii) Chaff cutter (hand operated), and (ix) Paddy Thresher (Pedal operated).

The above list of implements is subject to modifications if found necessary, from time to time and /or as per local agro-climatic conditions.

The scheme was sanctioned in the year 1983-84 with a budget provision of Rs. 50 lakh. The target in 1983-84 was set at 59,200 implements and the number of implements actually supplied under the scheme was 20,728. The expenditure on subsidy amounted to only about Rs. 14.76 lakh. Consequently in the year 1984-85 the sanctioned grant was reduced to about Rs. 23 lakh. In 1984-85, implements at subsidized prices were supplied in 88 blocks under the Centrally Sponsored Scheme. The beneficiary can purchase any number of implements subject to the maximum of Rs. 1,000 of subsidy.

In 1983-84 the reported number of beneficiaries was 3,336 marginal farmers and 6,494 small farmers. In 1984-85 the total number of implements distributed was 15,750. The amount of subsidy on the implements supplied was Rs. 7.94 lakh and the number of beneficiaries was 2,136 marginal farmers and 3,903 small farmers under the State scheme; 1,166 marginal and 1,374 small farmers received in all 2,941 agricultural implements under the Centrally Sponsored Scheme. The amount of subsidy was Rs. 2.67 lakh. The distribution of implements supplied under the scheme of Popularization of Improved Agricultural Implements (PIAI) according to type is given in Table 7.1. In Table 7.2 information regarding the prices of Improved Agricultural Implements is presented. The price of sickle in 1985-86 was only Rs. 10, the price of weeders ranged between Rs. 100 and Rs. 160, that of iron plough was above Rs. 300 and that of seed-cum-fertilizer drill was above Rs. 700.

In 1985-86 the sanctioned grant was Rs. 28.50 lakh. The amount spent on subsidy was Rs. 11.31 lakh, for the supply of agricultural implements to 8,579 farmers. Of these 2,302 were marginal farmers and 6,277 small farmers. The total number of

Table 7.1 : Improved Agricultural Implements Distributed Under PIAI Scheme in Maharashtra (1984-85)

Type of Implement	Number		Total	Per cent
	State*	Centrally Sponsored*		
Iron Plough	3,223	1,518	4,741	30.10
Straight Blade Harrow	114	39	153	0.97
Leveller	935	2	937	5.95
Seed-cum-fertilizer drill	1,536	267	1,803	11.45
Dry-land weeder	25	6	31	0.20
Rice weeder	11	-	11	0.07
Sickle	6,813	1,104	7,917	50.26
Chaff cutter (Hand operated)	78	5	83	0.53
Paddy Thresher	74	-	74	0.47
Total	12,809	2,941	15,750	100.00

* Information from a few blocks not received.

Table 7.2 : Prices of Improved Agricultural Implements Included Under the Scheme of PIAI (1985-86)

Type of Implement	Make	Price (Rs.)
Iron Plough - 4 Bullocks	Paras/Fulhar	535-570
Iron Plough - 2 Bullocks	"	340
Iron Plough - Heavy	Dandekar	613
Iron Plough - Light	"	564
Wooden Plough - Heavy	"	376
Wooden Plough - Light	"	333
Straight Blade Harrow	Krishi Udyog*	376
Straight Blade Hoe	"	269
Dry-land Weeder	"	104
Rice Weeder	"	156
Iron Leveller	Dandekar	535-590
Seed-cum-Fertilizer Drill	Krishi Udyog	745-840
Serrated Sickle	"	10
Hand operated Chaff Cutter	Deogiri	1,290
Pedal operated Rotary Paddy Thresher	Naval	1,613

* Maharashtra Agro-Industries Development Corporation Limited.

Source for Tables 7.1 and 7.2: Office records of the Directorate of Agriculture.

agricultural implements purchased under the scheme was 18,077. In addition, a sum of about Rs. 6 lakh was spent during 1985-86 for establishment of farmers' Agro-Service Centres for custom hiring of selected implements and Rs. 8 lakh for arranging demonstration of improved implements through extension staff under T & V scheme.

It was our observation that in the operation of the scheme, the whole process, right from ascertaining the demand from the farmers to actual supply of implements, takes a long time. So much so, that the implements demanded at the beginning of the kharif season actually arrive at the beginning of the summer season. The ascertained demand for improved implements is conveyed to the Directorate of Agriculture through the district administration. The Directorate then gets the budget sanctioned from the Government. The sanctioned budget is then conveyed back to the district administration for placing orders for the improved implements through the Directorate. The actual supply of implements upto the taluka level is undertaken by the Maharashtra State Agro-Industries Development Corporation (MSAIDC). The whole process, even the Officers of the Department agreed, is lengthy but they think this to be inevitable. We have observed during our discussions, that because of such delay, potential buyers get discouraged from buying these implements under this programme.

7.1 Monitoring

As per the sample design it was decided to select per district 30 beneficiaries who had received improved implements on subsidy.* The reference period for the monitoring study was the

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* It must be noted here that the present monitoring and evaluation study was to cover the beneficiaries of the scheme of Popularalization of Improved Agricultural Implements (PIAI). However, some of the beneficiaries were entitled to receive subsidy under other schemes like the Special Component Plan Scheme. The Special Component Plan Scheme - a family oriented programme to assist the Scheduled Castes and Nava Buddha families by giving package of services to help improve agricultural production and thereby raise annual income of these families above the poverty line includes supply of improved agricultural implements at 50 per cent subsidy. The scheme was introduced in the Maharashtra State in June 1982. The number of beneficiaries under the scheme were 7252, 10920 and 5134 respectively in the years 1982-83, 1983-84 and 1984-85. As it was not possible for the respondents to give information about the benefit received under each scheme separately the extent of subsidy received by some of the beneficiaries included in the sample is higher than that provided under the scheme of PIAI.

year 1985-86. We were informed that from our sample districts, Bhandara district had not placed any demand in the year 1985-86 and hence there was no distribution of improved implements in that year. In Pune district, the demand was placed very late and implements were sold from the earlier year's stock. As the total number of beneficiaries was small and as the beneficiaries were scattered over a number of villages, it was not possible for us to cover 30 beneficiaries from Pune district.

Districtwise number of beneficiaries selected for the monitoring study are given in Table 7.3.

Table 7.3 : Districtwise Distribution of Sample Beneficiaries Under the Improved Implements Scheme by Size of Land-holding (1985-86)

District	Size of land-holding (Ha.)					Total
	Upto 1	1 - 2	2 - 4	4 - 10	Above 10	
	Number of beneficiaries					
Ratnagiri	20	7	2	-	1	30
Jalgaon	3	11	4	11	1	30
Pune	7	5	2	-	-	14
Satara	-	10	19	2	-	31
Beed	-	22	6	-	1	29
Amravati	11	14	5	-	-	30
Bhandara	-	-	-	-	-	-
Total	41	69	38	13	3	164

Of the total 164 sample beneficiaries 41 i.e. 25 per cent were marginal and 69 i.e. 42 per cent were small farmers. In the official list of beneficiaries only small and marginal farmers appear, whereas in the present study it was noted that about 33 per cent of the sample beneficiaries were not eligible yet they managed to purchase improved implements under the scheme. The land-holding reported in the survey related to family holding

whereas it is possible to take advantage of Government schemes on the basis of recorded individual holding. Even farmers owning more than 4 hectares of land enjoyed the benefits of subsidy flouting the norms set up by the Government. In Jalgaon district as many as 16 out of 30 sample beneficiaries were non-eligible.

In the total 164 beneficiaries, there were only 10 from the Scheduled Castes (5 of these from Amravati district) and 9 from Scheduled Tribes (6 from Beed district). Distribution of agricultural implements by type is given in Table 7.4.

Table 7.4 : Districtwise Distribution of Agricultural Implements Purchased by the Sample Beneficiaries According to Type (1985-86)

District	Iron plough (light)	Iron plough (medium)	Wooden plough	Seed-cum-fertilizer drill	Spray pump	Serrated sickle	Other	Total
	Number of Implements							
Ratnagiri	-	-	-	-	-	30	-	30
Jalgaon	5	-	25	-	-	-	-	30
Pune	9	-	-	5	-	-	-	14
Satara	1	1	1	20	-	-	8	31
Beed	1	-	-	28	1	-	-	30
Amravati	15	12	-	-	3	-	-	30
Bhandara	-	-	-	-	-	-	-	-
Total	31	13	26	53	4	30	8	165

Of the total 165 implements distributed in the sample, ploughs constituted the majority of the implements. In all 44 iron ploughs (of which 13 ploughs were of heavy type - drawn by two pairs of bullocks) and 26 wooden ploughs were distributed. Almost all the wooden ploughs were distributed in Jalgaon district. Seed-cum-fertilizer drill was another important implement. Seed-cum-fertilizer drill and ploughs together constituted about 75 per cent of the total implements distributed. In Ratnagiri district only serrated sickles (Vaibhav Vila) were distributed. The list of

implements identified as improved implements includes rice weeder. According to the information given to us, neither in Ratnagiri district nor in Bhandara, this implement was distributed. Actually, Ratnagiri and Bhandara are the two most prominent paddy growing districts in Maharashtra, where rice weeders could be found useful. Greater extension effort to popularize the implement is thus necessary.

The cost of the implement purchased was Rs. 10 (Vaibhav Vila) in 30 cases, between Rs. 150-350 in 65 cases, between Rs.351 and Rs. 550 in 27 cases and Rs. 551 and Rs.1,000 in 43 cases. An important objective of our study was to ascertain the reactions of the beneficiaries regarding the cost of the implements. In our sample,about one-fourth of the sample beneficiaries told us that according to them the costs were on the higher side. The extent of subsidy secured was 25 per cent in about 25 per cent of the cases and 33 per cent in the rest of the cases.

7.2 Evaluation

The main objective of the evaluation of the Improved Implements Scheme was to find out whether the farmers continue to use the improved implements and ascertain their reactions about the implements. The reference period for the evaluation study was the years 1983-84 and 1984-85. For the evaluation study also, it was decided to select 30 beneficiaries per district distributed equally between the two talukas. Here also, we found that the number of beneficiaries of this scheme was considerably small as compared to the other schemes covered in our study and these beneficiaries were spread thinly over a number of villages. Hence, we had to cover a number of villages to contact the beneficiaries. In some districts like Bhandara, Jalgaon and Satara, we were not able to cover the required number of beneficiaries. The total number of beneficiaries covered under the evaluation study of Improved Implements Scheme was 195. Of these,approximately 50 per cent beneficiaries had received implements in the year 1983-84

and the remaining in the year 1984-85. Table 7.5 gives the districtwise distribution of beneficiaries according to land-holding size groups.

Table 7.5 : Districtwise Distribution of Sample Beneficiaries Receiving Improved Implements by Size of Land-holding (1983-85)

District	Size of land-holding (Ha.)					Total	Scheduled Castes	Scheduled Tribes
	Upto 1	1-2	2-4	4-10	Above 10			
	Number of beneficiaries							
Ratnagiri	19	8	-	1	-	28	-	-
Jalgaon	4	15	1	4	1	25	8	-
Pune	6	10	14	3	-	33	1	1
Satara	8	6	11	3	-	26	-	-
Beed	-	28	2	-	1	31	1	2
Amravati	2	12	2	7	7	30	3	2
Bhandara	1	8	8	3	-	20	1	-
Total	40	87	38	21	9	195	14	5

As noted earlier, the scheme was evolved only for the marginal and small farmers. However, in our sample we found that about 65 per cent of the beneficiaries belonged to marginal and small size groups while the remaining 35 per cent of the farmers were from the larger size-groups. There were considerable inter-district variations. In Ratnagiri district 27 out of 28 families covered in the sample were marginal and small and in Beed 28 out of 31 were small farmers. At the other end, in Pune, Satara and Bhandara districts half of the sample farmers were medium and large land-owners.

Majority of the beneficiaries, i.e. about 90 per cent were of the general category (other than Scheduled Castes and Scheduled Tribes) while about 7 per cent belonged to the Scheduled Castes and about 3 per cent of the beneficiaries belonged to the Scheduled Tribes. Majority, viz., 85 per cent of the sample beneficiaries

owned traditional implements before buying the improved implements, and these implements continued to be in use.

At the time of inquiry, about 96 per cent i.e. almost all the beneficiaries were in possession of the improved implements purchased under this scheme. About 3 per cent of the beneficiaries claimed that they had not obtained implements on subsidy under this scheme although the list of the beneficiaries given to us contained their names.

In our sample, 195 beneficiaries had obtained in all 207 implements. Eight beneficiaries had obtained two implements each and in one case four implements were purchased under the scheme. Seed-cum-fertilizer drill and iron plough were found to be the most common implements in the sample (Table 7.6). Approximately 40 per cent of the beneficiaries had obtained seed-cum-fertilizer drill and about 30 per cent of the beneficiaries had obtained iron plough. In the Ratnagiri district all the sample beneficiaries reported purchase of only serrated sickles. The cost of the sickle is Rs.10. It must be noted that in Ratnagiri district all the beneficiaries were marginal and small farmers.

Implements costing over Rs. 500 were purchased in relatively larger numbers in Amravati, Jalgaon, Pune and Satara districts. These were purchased by quite a few medium and large farmers. Despite the subsidy it is not easy for marginal farmer to mobilize the necessary amount for the purchase of improved implements. Consequently even though the scheme is designed for the weaker sections, many of them can afford to purchase mainly the relatively inexpensive implements. Among the total 38 marginal farmers who had purchased implements under this scheme 19 had purchased sickle. Excluding these cases the number of marginal farmers covered among the sample beneficiaries formed only 10 per cent of the total. (Table 7.7.)

As noted earlier, some of the beneficiaries have taken advantage of more than one scheme. The amount of subsidy was

Table 7.6 : Districtwise Distribution of Implements Purchased by the Sample Beneficiaries by Type of Agricultural Implement (Evaluation Study)

Type of Agricultural Implement	District							Total
	Ratna-giri	Jal-gaon	Pune	Satara	Beed	Amra-vati	Bhan-dara	
	Number of implements							
Iron Plough (light)	-	25	1	7	-	5	-	38
Iron Plough (medium)	-	-	15	-	-	8	-	23
Seed-cum-fertilizer drill	-	-	12	19	31	13	2	77
Blade hoe dry-land weeder	-	-	-	-	-	-	9	9
Straight blade Harrow	-	2	-	-	-	-	8	10
Sprayer, Duster	-	5	7	-	-	3	-	15
Serrated Sickle	29	-	-	-	-	-	-	29
Winnower	-	-	-	-	-	-	3	3
Total	29	32	35	26	31	29	22	204*

* Type of implement not specified in three cases.

Table 7.7 : Distribution of Agricultural Implements Purchased by the Sample Beneficiaries According to Type of Implement and Size of Land-holding (Evaluation Study)

Type of Agricultural Implement	Size of land-holding (Ha.)					Total	Per cent
	Upto 1	1-2	2-4	4-10	Above 10		
	Number of implements						
Iron Plough (light)	6	18	7	5	2	38	18.63
Iron Plough (medium)	5	5	11	1	1	23	11.27
Seed-cum-Fertilizer drill	6	45	13	9	4	77	37.75
Blade hoe dry-land weeder	1	3	4	1	-	9	4.41
Straight blade Harrow	-	7	3	-	-	10	4.90
Sprayer, Duster	2	10	-	1	2	15	7.35
Serrated Sickle	20	8	-	1	-	29	14.22
Winnower	-	1	-	2	-	3	1.47
Total	40	97	38	20	9	204*	100.00

* Type of implement not specified in three cases.

reported to be 25 per cent, 33 per cent and 50 per cent in 29 per cent, 11 per cent and 52 per cent of the cases respectively (Table 7.8). Hundred per cent subsidy was reported by 12 beneficiaries from Jalgaon district and 3 from Amravati district. (The latter three were not small or marginal farmers.)

Table 7.8 : Distribution of Agricultural Implements Purchased by the Sample Beneficiaries by Extent of Subsidy and Size of Land-holding (Evaluation Study)

District	Percentage of subsidy received	Size of land-holding (Ha.)					Total
		Upto 1	1-2	2-4	4-10	Above 10	
		Number of implements purchased					
Ratnagiri	25	19	7	-	1	-	27
	33	-	-	-	-	-	-
	50	-	-	-	-	-	-
	100	-	-	-	-	-	-
Jalgaon	25	-	-	-	-	-	-
	33	-	-	-	-	-	-
	50	5	8	1	4	1	19
	100	-	12	-	-	-	12
Pune	25	1	2	4	-	-	7
	33	1	3	-	-	-	4
	50	4	7	9	3	-	23
	100	-	-	-	-	-	-
Satara	25	1	-	3	1	-	5
	33	-	-	-	-	-	-
	50	5	6	7	2	-	20
	100	-	-	-	-	-	-
Beed	25	-	-	-	-	-	-
	33	-	-	-	-	-	-
	50	-	28	2	-	1	31
	100	-	-	-	-	-	-
Amravati	25	2	6	1	2	4	15
	33	-	-	-	-	-	-
	50	-	6	-	4	2	12
	100	-	-	1	1	1	3
Bhandara	25	-	1	3	-	-	4
	33	1	9	5	3	-	18
	50	-	-	-	-	-	-
	100	-	-	-	-	-	-

Note: Extent of subsidy not indicated in seven cases.

Use of the improved implements can be increased if farmers having improved implements rent out these implements to those who do not have them. Of the 195 beneficiaries 54 i.e. about 28 per cent of the beneficiaries reported that they rent out implements (Table 7.9). It was found that in Beed district as many as 28 beneficiaries had rented out their implements. It is important to note that all these 28 beneficiaries were hiring out seed-cum-fertilizer drill. Hiring out improved implements can convince other farmers of their advantages by actually trying them out in the field. In addition to popularizing improved implements, this practice of renting out gives monetary returns to the beneficiaries. In our sample, of the 54 beneficiaries who were renting out their implements, nearly 31 per cent beneficiaries earned an annual income upto Rs. 100 while another 55 per cent beneficiaries earned Rs. 100 and more by renting out the implements. Thus renting out implements can be an additional source of cash income to the farmers who are generally in need of cash.

Table 7.9 : Number of Beneficiaries Who Rented Out Improved Agri-Cultural Implements (Evaluation Study)

District	Rent out implements			Total	Income earned by renting out implements (Rs.)			
	Yes	No	No Response		Upto 100	101-200	201-500	Above 500
	Number of beneficiaries				Families renting implements*			
Ratnagiri	-	21	7	28	-	-	-	-
Jalgaon	4	20	1	25	3	-	1	-
Pune	5	27	1	33	1	-	-	-
Satara	2	22	4	28	-	-	-	1
Beed	28	2	1	31	6	21	-	1
Amravati	7	23	-	30	5	-	-	-
Bhandara	8	12	-	20	2	2	3	1
Total	54	127	14	195	17	23	4	3

* Information on rental income not available in 7 cases.

In the sample, as many as 80 per cent of the beneficiaries had managed to buy the implements from out of their own funds and the remaining 20 per cent, had to borrow money from different sources. During our discussions with many farmers, we observed that the timing of the arrival of implements in the Panchayat Samiti is very crucial for the purchase of the implement. Many farmers who had decided to buy the implements, could not do so, as by the time the implements finally arrived, they had either run out of the money or had already purchased them from outside agencies.

The sample beneficiaries were generally aware of the working of the implements and its advantages. However, almost all the beneficiaries said that they had not seen any special demonstration of the working of the implement. About 30 per cent of the beneficiaries reported that there were no facilities nearby to repair the implements (Table 7.10). This problem, according to them, did not arise in the case of traditional and locally produced implements.

Table 7.10 : Districtwise Distribution of Beneficiaries According to Availability of Repair Facility Nearby (Evaluation Study)

District	Repair facility available nearby		No Response	Total
	Yes	No		
	Number of beneficiaries			
Ratnagiri	-	3	25	28
Jalgaon	5	17	3	25
Pune	25	3	5	33
Satara	23	-	5	28
Beed	-	31	-	31
Amravati	30	-	-	30
Bhandara	16	4	-	20
Total	99	58	38	195

In informal discussions many farmers complained about the quality of the implements. Some of the officials also stated that the quality of the implements was not satisfactory, and it was difficult for them to persuade the farmers to buy them. However, when the information was sought in the schedule formally only 8 per cent of the beneficiaries recorded their dissatisfaction regarding the quality of the implements. About 21 per cent beneficiaries had reported that they faced difficulties in the operation of the implement and about 28 per cent beneficiaries had given suggestions to improve the functioning of the implements. Majority of the suggestions were regarding seed-cum-fertilizer drill and the iron plough. The important suggestion regarding the seed-cum-fertilizer drill are as follows:

a) Some farmers pointed out that the holes provided in the funnel of the seed-cum-fertilizer drill to put the seeds in, were small and the implement cannot be used for sowing bigger seeds like groundnut and peas.

b) Many farmers complained about the poor quality of welding for attachments. According to them welding was not done properly. As a result the attachments often slipped off. It was suggested that nut-bolts should be used instead of welding.

c) Some farmers pointed out that the seed-cum-fertilizer drill should be made lighter in weight so that the sowing of the seeds will not be very deep. This, according to them, will facilitate better germination.

Some suggestions were made regarding the iron ploughs also.

a) Many farmers complained about the poor quality of the blade.

b) Many beneficiaries suggested that the weight of the iron plough should be reduced as it becomes difficult for the bullocks to draw the plough.

It must be pointed out that two types of iron ploughs were distributed. First type of plough required a pair of bullocks while the second type required two pairs of bullocks. Most of the ploughs requiring two pairs of bullocks were distributed in Amravati district. Here, some of the small and marginal farmers

also had obtained such ploughs. It is generally observed that smaller farmers do not often own even one pair of bullocks. In such a situation if a heavy plough is given to them, naturally they will find it difficult to operate it. Insufficiency of bullock power may lead to some operational difficulties and thus purchase of inappropriate implements may become a permanent liability to the farmers.

c) In contrast with the earlier suggestion, a few farmers suggested that the iron plough should be heavier so that depth of the tillage can be increased. This is because the requirements are different in different areas and the supply of implements has to be in conformity with the location-specific requirement.

7.3 Limitations on the Spread of Improved Agricultural Implements

It must be noted that most of the agricultural implements that are in use today have been evolved through local traditions and trial and error in the period when agriculture was not as hard-pressed as it is now.

Alternative implements designed in recent decades have tried to integrate agronomic principles into their design. Unfortunately no detailed studies of savings of time and effort or on operational efficiency have been carried out. Consequently firm assessement of their superiority based on quantitation is not possible.

The hand-held agricultural implements are designed mainly to save labour-time and/or effort. However, the benefits that accrue to the farmer who works on his own account are not palpable and more importantly are not manifestly economic. It is, therefore, difficult to induce this section - the small and even the medium farmer - to go in for additional outlays for alternative implements. Even with subsidy the amount that needs to be mobilized is not small in relation to the cash resources that the small farmers have. Except for serrated sickle which costs just Rs.10 no other implement has been purchased on a large scale by the marginal and small farmers.

The other major constraint in the case of small and marginal farmers is the small scale of agricultural operation. Since the area is small the implement is needed only for a short period and remains idle most of the time. Consequently the farmer does not find it worthwhile to lock up his scarce resources in purchasing improved implements. It would be better to strengthen the Agro-Service Centres for custom hiring of selected agricultural implements rather than inducing individual farmers to buy the implements at subsidized prices.

CHAPTER VIII

SUMMARY AND CONCLUSIONS

8.1 Scope of the Study

At the instance of the Government of Maharashtra, the present study was taken up in the Agro-Economic Research Centre of the Central Ministry of Agriculture at our Institute. The main objectives of this study are: (i) to examine implementation of the scheme in the light of instructions issued, (ii) to monitor the progress of the working of the schemes, (iii) to evaluate the impact of the scheme and (iv) to explore research methodology for monitoring and evaluation studies.

It was decided to take up monitoring and evaluation studies with regard to the following schemes:

(i) Minikit Scheme (Seed and Fertilizer)

(ii) Plant Protection Scheme

(iii) Improved Agricultural Implements Scheme

(iv) National Pulses Development Scheme.

The Minikit Scheme is one of the ambitious schemes of development launched by the Government of Maharashtra. The scheme is designed to induce small and marginal farmers to use improved varieties of seed, use fertilizer and adopt improved cultivational practices. The seed and fertilizer minikits are distributed free of charge to specified target groups. The target group is small and marginal cultivators, with special preference to cultivators from the Scheduled Castes (S.C.) and the Scheduled Tribes (S.T.). The Department of Agriculture is responsible for formulating and operating the scheme. The Department proposed to distribute over 68 lakh seed minikits during the period covered in this study (1982-83 to 1985-86) and actually distributed about 59 lakh seed minikits. In addition 29 lakh fertilizer minikits were distributed during the same period.

The main objective of the Plant Protection Scheme is to help the cultivators to control pests and diseases by giving them the necessary pesticides and insecticides at subsidized prices. To ensure proper application of pesticides, sprayers and dusters are also supplied at subsidized prices.

The scheme for popularization of Improved Agricultural Implements, started in 1983-84, aims to bring these implements within the reach of marginal and small farmers, and thus help improve agricultural production and productivity. Subsidies are offered to marginal and small farmers for purchasing improved implements.

The major objective of the National Pulses Development Programme is to popularize improved varieties of pulse crops and to induce the farmers to bring a larger area under pulse crops.

8.2 Survey Methodology

Since the main thrust of the study was on monitoring the operational efficacy and the impact of the scheme on the beneficiaries of these programmes, a sample survey of the farmers, receiving benefit under the various schemes, was carried out with the help of a structured questionnaire filled in through personal interview. This was supplemented by informal discussions with the beneficiaries. Separate questionnaires were designed for each of the four schemes under study. The Village Extension Workers (VEW), the main agents responsible for implementing the above schemes, were also interviewed using a structured schedule. In addition informal discussions were held with the VEWs, Agricultural Officers, and other officials at the village and taluka level.

The sample of beneficiaries was drawn adopting a multi-stage sampling procedure. First, seven districts in the State were selected at random, selecting one district each from the seven agro-climatic zones of the State. Next, two talukas were selected at random from each of the seven selected districts.

Complete lists of the beneficiaries for all the villages from these selected Talukas were obtained. Random selection of

villages was done to get a specified number of beneficiaries on the basis of these lists with the proviso that all the beneficiaries in the selected villages were to be covered for field investigation for the minikit evaluation study. Therefore, only so many villages were selected from each Taluka as would give the specified number of sample beneficiaries. In all 209 villages were covered from the 14 selected Talukas in the 7 selected districts. The families selected from each district were equally distributed between the two selected talukas in each case.

(i) For minikit evaluation study, 300 beneficiaries per selected district were included in the sample.

(ii) For minikit monitoring study, 150 beneficiaries each for Kharif season and Rabi seasons were selected from each of the selected districts.

(iii) For Plant Protection Scheme, 120 beneficiaries per district were selected for evaluation and 60 each for kharif and rabi seasons per district were selected for the monitoring study.

(iv) For Improved Agricultural Implements Scheme, 30 beneficiaries were selected for the evaluation study and another sample of 30 beneficiaries was drawn for the monitoring study from each district.

(v) As the beneficiaries of the National Pulses Development Programme were covered in the seed minikit distribution scheme, there was no need to take a fresh sample of the beneficiaries for this study. An additional questionnaire was designed to get the necessary information regarding the working of the NPD Programme and all the beneficiaries of NPDP from among the minikit scheme sample beneficiaries were covered for the evaluation study of NPDP. In Table 8.1 information regarding the number of beneficiaries planned to be covered under each scheme and the number actually covered in the investigation is given. It may be noted here that we came across cases where some persons appearing in the list of the beneficiaries, when approached, reported that

Table 8.1 : Number of Families Planned to be Covered in the Sample for the Study of Various Schemes and the Number Actually Covered

Scheme	Number of families	
	Planned to be covered	Actually covered
Minikit - Evaluation	2,100	2,059
Minikit - Monitoring - Kharif	1,050	1,057
Minikit - Monitoring - Rabi	1,050	1,047
Plant Protection - Evaluation	840	850
Plant Protection - Monitoring - Kharif	420	389
Plant Protection - Monitoring - Rabi	420	302
Improved Agricultural Implements - Evaluation	210	195
Improved Agricultural Implements - Monitoring	210	164
National Pulses Development Scheme - Monitoring - Kharif	-	167
National Pulses Development Scheme - Monitoring - Rabi	-	245

they had not received the specific benefit e.g. seed minikit, pesticide, etc. Such spurious cases formed about four per cent of the sample families in the minikit evaluation study and eleven per cent in the evaluation study of Plant Protection Scheme. Quite a few families said that they do not even know of the scheme.

Data Limitations: Before summarizing the results of the investigations it is necessary to note the limitations of the data collected through a structured schedule in a single visit. The large number of villages included in the study and the size of the sample to be covered within a period of six to eight months made it necessary to complete the investigational work in each village within a short period with the help of a number of investigators. It was experienced that there were definite discrepancies between the answers recorded in the formal structured schedule and the responses elicited in informal discussions. This was true in the

case of both the Scheme beneficiaries and the VEWs. However, the informal responses could not be quantified. The structured schedule included questions regarding the experience of the beneficiaries about the operational aspects of the scheme, the difficulties they faced and quantitative data relating to yields. The responses were rather stereotype mainly because the beneficiaries are naturally interested in conveying a positive image of the scheme under which seeds and fertilizers are distributed free of cost. As to quantitative information, it was difficult for the respondents to give data on cropwise yield for the three previous years. The information was not based on any record but it was an informed guess. In a large number of cases the respondents did not even know the exact yield of the plot sown with minikit seed as the crop is not usually harvested and weighed separately. At times, minikit seeds are not even sown in a specially demarcated plot. Unless the area is demarcated and the crop yield is separately measured, it is not possible to get an accurate figure of the yield. The figures on production thus cannot be taken at their face value but are presented in the report to get an idea about the subjective perception of the beneficiaries.

8.3 Major Findings

The programmes under study were target group oriented. It is important to examine the extent to which the target groups were reached through these programmes. Information regarding the proportion of marginal and small farmers and the Scheduled Castes and the Scheduled Tribes farmers, among the sample beneficiaries included in the study, under each scheme is presented in Table 8.2. It will be seen that the marginal farmers did not receive preferential treatment under any of the schemes, whereas the small farmers were better represented. The marginal farmers had about proportional representation in the minikits distribution scheme under which kits worth Rs. 8 to Rs. 30 were distributed. Under the scheme of improved agricultural implements, they seem to form

Table 8.2 : Representation of Marginal and Small Farmers and Scheduled Castes and Scheduled Tribe Farmers Among the Beneficiaries Under Various Schemes

Scheme	Percentage among total beneficiaries			
	Marginal Farmers	Small Farmers	Scheduled Castes	Scheduled Tribes
Minikit - Evaluation	34.33	31.11	17.12	2.52
Minikit - Monitoring - Kharif	31.73	35.38	14.29	5.20
Minikit - Monitoring - Rabi	30.18	31.71	11.36	5.64
Plant Protection - Evaluation	11.95	32.14	6.00	4.12
Plant Protection - Monitoring - Kharif	13.37	29.25	6.68	
Plant Protection - Monitoring - Rabi	9.53	28.91	6.62	
Improved Agricultural Implements - Evaluation	20.51	44.61	7.18	2.56
Improved Agricultural Implements - Monitoring	25.00	42.07	6.10	5.49
National Pulses Development Scheme - Monitoring - Kharif	35.93	36.53	9.58	2.40
National Pulses Development Scheme - Monitoring - Rabi	32.24	21.23	9.39	3.26

about 20 per cent of the beneficiaries; however, it must be noted that half of these had purchased serrated sickles, each worth Rs.10 only. Thus the substantive beneficiaries were only about 10 per cent. Similarly they are under-represented in the Plant Protection Scheme.

Among the Scheduled Castes and the Scheduled Tribes, the former were better represented while the latter seem to be neglected under all the schemes.

There were a number of operational problems that made it difficult to reach the target groups. Firstly, some of the VEWs did not take pains to make a proper selection. It must be mentioned here that in Beed district, the target groups were much

better represented; the VEWs claimed that they had taken special care to prepare lists at the village level and to reach the target groups. Some VEWs from other districts maintained that the pressure of the influential groups in the village makes it impossible for them to adhere to the priorities set by the Government. The powerful groups corner the best seeds, more effective pesticides and even manage to get subsidy under the scheme of Improved Agricultural Implements designed exclusively for the benefit of marginal and small farmers. Consequently, the target groups receive the jowar/bajra seed minikit, B.H.C. powder and serrated sickles. Another factor was the number of villages that each VEW had to cover. When the number of villages to be covered was large (more than 6-7 villages) it was difficult for the VEW to make a comprehensive list and proper selection.

Operational Efficacy: Next, we will consider the operational efficacy of the programmes. Timely delivery is crucial in the case of seed, fertilizer and pesticide distribution. However, this is not easy to achieve given the massive size of operation. The Zilla Parishad and Panchayat Samitis are responsible for the delivery of the minikits to taluka headquarters from where the VEWs have to carry the minikits to the points of distribution. When the VEWs had to attend to several villages (40 per cent of the VEWs in the sample had 5 to 9 villages and 17 per cent had more than 9 villages under their jurisdiction) delays were inevitable. Such a large coverage also made it difficult for the VEWs to provide timely guidance to the farmer. Particularly, in the case of pesticide application, this problem was acutely felt.

Efficacy of guidance was dependent on several factors like the selection of the VEW, the training and retraining facilities, the placing of VEWs and frequency of transfers. It was noted in the present study that many VEWs had not undergone any special training in the recent past. Some were posted away from their native region. In such cases they were not quite familiar with

the local conditions and could not easily build rapport with the farmers. Moreover, they were often more interested in the transfer to their home taluka than in their work. A number of VEWs stayed at taluka places and could not devote adequate time for guidance. The scattered nature of beneficiaries also made it difficult to meet the beneficiaries and extend advice in time.

The third major factor affecting the efficacy of the programme is the appropriateness of the seed, fertilizer, and pesticide distributed. It was noted that, even though the scheme of seed minikit distribution aims at propagating mainly the new varieties, in many cases the established varieties were distributed. Some of the varieties like BJ-104 or BJ-560 of bajra which are very sensitive to pest infestation and, therefore, not popular were included in the distribution. New varieties like Jowar Hybrid SPH-201, Bajra - MH-180, MH-182, RHR-1, Paddy - Ratnagiri 114-2-1 or Ratnagiri 500-5-1 released in 1985-86 have not been included in the minikit seed distribution programme. Actually the scale of operation makes judicious and careful selection of varieties difficult. If the aim is to introduce and demonstrate the advantages of new varieties, a different type of approach is necessary. This point will be discussed in the next section.

A large number of varieties are considered suitable to all the districts in the State. However, some of the varieties, particularly suited to certain regions, got distributed outside those regions; e.g., green gram J-781 variety suitable to Western Maharashtra got distributed in Jalgaon, No. 55 variety of black gram recommended for Khandesh was distributed in all parts of the State.

For fertilizers, two standardized minikits, one for cereals and other for pulses and oilseeds were distributed. As the fertilizer requirements vary with crop, soil type, rainfall/ irrigation, etc., the fertilizer minikit could not be possibly adjusted to the local conditions, again due to the massive scale

operation of the scheme. Besides, the dose of fertilizer was not adequate for many crops and the farmers were expected to supplement it; this was not possible for the marginal and small farmers.

As regards pesticides, there was a common complaint that the beneficiaries received mainly B.H.C. and the more effective and costly pesticides were cornered by the non-eligible farmers. The other constraint in effective application of pesticide was the lack of appliances. Adequate rental facility is not yet available, and even though a subsidy is offered, small farmers can seldom afford to lock up their scarce funds in buying appliances.

In the case of scheme for subsidized promotion of Improved Agricultural Implements, there was a considerable dissatisfaction. The major complaint was about the quality of the implements. The other lacuna was that most of the beneficiaries of this scheme did not come from the target group i.e. small and marginal farmers, particularly from the Scheduled Castes and Scheduled Tribes. Few from the target groups could benefit from the scheme as it involved 50 per cent contribution which they could seldom manage to mobilize. Even some of those beneficiaries who did get implements, at times found it to be a liability as the implement proved to be of wrong type or of poor quality.

8.4 Limitations of the Programme

The four schemes under study did provide the target group with some inputs in terms of seeds and fertilizers. However, to be effective, certain complementary inputs are needed which the small farmers do not have. Besides, many marginal farmers have small pieces of inferior land on which they somehow pursue subsistence agriculture. They prefer to grow cereals for home consumption rather than growing cash crops. The rationale for this preference needs to be taken into consideration. First, cultivation of local varieties of cereal crop involves little cash input. These varieties are hardy, adopted to local conditions and hence, the

risk of failure due to inadequate/untimely rains and pest menace is less. If they go in for the production of cash crops,since they lack the capacity to hold stocks, they have to sell the produce immediately after the harvest when the prices are at the lowest. In addition, they have to buy the cereals from the market; this would naturally involve higher expenditure as compared to the production cost of home-grown cereals. They, therefore, prefer the security of home-grown staple cereal rather than enter the market. Moreover, they cannot depend for their cereal requirements either on the fair price shops in the villages where supplies are uncertain and quality is poor or the open market where prices are at peak when the farmer's need is acute. Besides, the pulse crops do not prove to be so profitable as to induce a shift. When the relative income of the improved varieties of cereals and pulses was compared, it was noted that the pulses did not have a definite edge.

The small and marginal farmers are, in fact, aware of the potential productivity of improved varieties. However, unless they have the capacity to buy complementary inputs and risk-bearing capacity in the case of crops failure, they cannot afford to shift to the cultivation of the pest-sensitive and capital-intensive new varieties of pulses and oilseeds.

If the aim of the Pulses and Oilseeds Development Programme is to increase the production and area under cultivation of these crops, the present scheme has limited value as it has all the deficiencies of a massive operation. Besides, the fact that demonstration is difficult on the small plots of small and marginal farmers who lack complementary resources; delays in delivery of seed, inadequacy and inappropriateness of fertilizer, lack of guidance, etc., are the other factors that discourage even the medium farmers from taking to cultivation of new varieties of pulses and oilseeds. Demonstration on small scattered plots adds to the problems of pest control if the seasons of maturity do not coincide for all the surrounding plots. Serious bird menace was

reported in the case of sunflower cultivation, particularly when it was cultivated in small, scattered patches.

The main lacuna of the minikits distribution scheme is that the objectives set cannot possibly be met by a single strategy and programme. Different sets of policies are needed to meet the variety of objectives, like, increasing the area and production of specified crops and improving the productivity of small and marginal farmers by inducing them to shift to new varieties or crops. It was noted that when free seed was made available, it was used even by the small farmers. However, most of the marginal and small farmers indicated that they were not ready to shift to the new crops, if they had to buy the seeds from the market. The types of policies appropriate for the different sets of objectives are briefly discussed in the following.

8.5 Appropriate Policy Measures

(A) For increasing the area under cultivation of pulses and oilseeds a different strategy is called for. If the agricultural experimental and research stations, after careful testing for local conditions, release high yielding varieties of pulses and oilseeds and introduce them through proper demonstration, the farmers who have the means to grow crops for the market and weigh the relative profitability of various crops, may shift to them. However, if the present price structure and yield levels are considered, pulses and oilseeds do not have much advantage. Special pricing and procurement policies would be necessary if the cultivation of pulses and oilseeds is to be made attractive to the market oriented farmer.

The experience of the last three decades indicates that it had not been possible to bring about an increase in the production of pulses. If the pressing national need of increasing the production of pulses is to be met certain degree of compulsion would be necessary. The Government will have to introduce a measure like compulsory production and levy on pulses linked with

the size of land-holding on farms above a specified size.* To make this measure effective, the supply of electricity for agricultural use should be made on the condition that the specified quantity of pulses is produced and delivered as levy to the Government.

(B) For inducing the small farmer to shift to new crops a different approach, than that adopted now, would have to be accepted. The main reason why the marginal and small farmers prefer subsistence farming and do not go in for cash crops is, as noted above, that their poor resource base does not give them the risk bearing capacity which is essential to enter the market. It is therefore necessary, first, to strengthen their resource base. For this, the following measures are necessary: (i) strict enforcement of Land Ceiling Act and redistribution of surplus land, (ii) creation of large farms through organization of marginal and small farmers into joint cultivation teams and consolidation of land-holdings, (iii) preparation of a scientific plan for land and water use for the relevant water-shed and making available to the team of small and marginal joint farmers their due share of water in the water-shed, (iv) supply of bullocks and improved agricultural implements to the team of joint cultivators at subsidized prices, (v) provision of guidance and help to the team through VEWs in new agronomic practices, where emphasis need not be placed only on the package of HYV-fertilizer-pesticide, (vi) the shift of funds used at present for free distribution of seed and fertilizer and supply of implements, appliances at subsidized prices to the promotion and improvement of the productivity of these teams of small and marginal farmers through the measures suggested above.

If the resource base, the input base and the knowledge base of the teams of marginal and small farmers are thus strengthened,

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* Say 8 hectares in terms of dry hectare equivalent, putting one perennially irrigated hectare equal to 4 dry hectares and one seasonally irrigated hectare equal to 2 dry hectares.

it should be possible for them to grow a variety of crops according to land suitability and adopt improved practices. This will help increase the production and productivity of pulses and oilseeds.

In sum, the free distribution of minikits and subsidized distribution of pesticides cannot strengthen the resource position of the marginal farmer; the schemes provide some small immediate benefit and are therefore popular. But the gains are certainly not commensurate with the costs involved. Instead of adopting an ad hoc schemewise approach that ignores the constraining factors, an integrated and location specific approach, as suggested above, should be accepted.

8.6 Methodological Issues

The suitability of survey methods for evaluation of programmes like minikit distribution and plant protection have to be assessed. These methods rely, for evaluation, mainly on the opinions expressed by the beneficiaries. The respondents in such surveys usually express a favourable opinion for two reasons. First, the programme does help in a small measure the selected farmers, whether belonging to the target group or not and whether the extent of benefit is commensurate with the total cost or not. Secondly, and more importantly, favourable responses are recorded because most beneficiaries like to see that the schemes of free and subsidized distribution are continued and they feel that the scheme will be continued if they express a favourable opinion about it. In formal interviews, therefore, a vast majority makes only favourable points, although, in informal discussions, they express quite contrary views.

If the survey method is to be effective for evaluation, then a number of changes have to be introduced starting from the very initiation of the scheme itself. It is necessary to educate the VEWs about the method of evaluation and request them to educate the farmers for proper maintenance of record. For this, it is necessary to reduce the number of farmers attached to a VEW

and group them in a team so that the VEW can give intensive attention and proper guidance. It is necessary to supplement the survey method with a more objective method of evaluation based on crop cutting experiments in demonstration and control plots. For such evaluation also, the VEWs, and through them the participating beneficiaries, will have to be adequately educated before the scheme is launched. If effective monitoring and evaluation is organized it can contribute to the quality of agricultural extension work.

Following broad guidelines are therefore suggested for effective monitoring and evaluation: (i) The demonstration plots need to be properly demarcated, and the plant population maintained as per stipulations. It is noted that the farmers today feel that the minikit seed is not adequate for .10 ha. area and sow it over a smaller area. The rationale for advocating lower density of plant population in the case of HYV must properly reach the farmers, lest they feel that they are wasting their scarce land resource. (ii) An area of .10 ha. is too small to adopt special agronomic practices and it is advisable to have a larger area for experimentation with HYV. This can be achieved by pooling the land resources of the farmers for cultivation purpose; for a group of say 10 farmers one hectare can be sown with new varieties and one hectare with current varieties. (iii) The VEWs will have to provide detailed guidance regarding new agricultural practices and see to it that the necessary inputs reach these teams in adequate quantities and at proper time. (iv) Harvesting will have to be done separately and data on yield recorded for the experimental and control plots. Such experimentation must be carried on, on different soil types, locations and under a variety of water availability conditions so that the suitability of new varieties under varying conditions can be judged. (v) The new varieties demand more cash inputs and the expenditure per hectare is higher. If the yield levels are

considerably higher (twice or more) then and then alone will it become attractive to the farmer.

Proper maintenance of records on all these aspects, area, seed rate, material and labour inputs, costs involved, and crop yield is essential for scientific evaluation of the scheme. However, the nature of the present scheme is such that scientific evaluation is not possible. In the absence of proper implementation of the scheme, demarcation of plots and weighment of crop and maintenance of requisite records, the study is bound to be impressionistic. Only if the basic approach to the scheme itself is changed, systematic evaluation of the scheme would be possible.

8.7 Recommendations

(1) Free distribution of seed and fertilizer minikit, and supply of pesticide appliances and improved agricultural implements at subsidy to individual farmers, as carried on today, is not likely to achieve the aim of increasing the area under pulses and oilseeds and in productivity gains on small and marginal farms. The scheme will have to be reorganized using the same set of machinery, financial resources and material inputs provided by the Government. (2) The essential steps for reorganization are: (i) The land resource of small and marginal farmers should be strengthened by giving them surplus and Government land. Large area units must be formed by pooling the land of say 10 to 15 farmers and through exchange and consolidation of holdings. The title of land will be vested in individual farmers but for planning and operational purposes the land should be treated as one unit. (ii) A watershed plan must be prepared for the tracts where these lands are located and crops appropriate for the specific agro-climatic region must be selected. At present it is noted that crops and their varieties are distributed over wide tracts even though the yield is not particularly encouraging. (iii) The VEWs should be allotted only about 25 to 30 teams located within a neighbourhood. It would be better if they stay in one of these villages. Proper

employment conditions (stay and work) should be provided to enable VEWs to stay in the villages. The choice of place of work (whether in the native district or outside) should be left to the VEWs. Routine transfers should be avoided. Appropriate and intensive training in the new experimentation must be provided for the VEWs. (iv) The VEWs should be made responsible for the selection of sites for experimentation and arranging for soil testing. This work will have to be done well in advance. Proper choice of crop and varieties can be made only if advance preparations are made. The fertilizers should also be provided, adequate in quantity and appropriate in composition. Today expensive fertilizers are being distributed in small quantities without proper consideration of composition. Consequently optimum results are not realized. (v) The VEWs should guide the farmers about proper maintenance of records. The VEWs should maintain lists of beneficiary groups and records of inputs given to them. In the case of irrigated farming, advice on proper water application methods must also be given. Simple, inexpensive but scientific methods of irrigation can increase greatly the effective use of water. (vi) The team should be helped to complete the necessary land development work and the necessary farm implements and bullock power must be provided to the team on subsidized basis. The implements must be properly tested and proven. Repair service facilities must be provided. Today the implements are given to individual small farmer who cannot use the implement optimally as the size of his holding is very small. Consequently bullocks and implements, if available to small farmers, are under-utilized. This can be avoided if these are made available to a team of small farmers. (vii) Plant protection work would be easy and effective if there is crop planning in a water-shed. Attempts should be made to see that all farmers in a given water-shed follow a scientific crop plan. To induce them to follow the plan, provision of plant protection service, supply of electricity at subsidized rate (as given today) should be made

conditional on following the prescribed crop plan. This will also help implement a scientific water utilization plan and water application methods. (viii) In the water-shed plan it might be necessary to allot certain area for afforestation and certain inferior land not fit for cultivation might have to be reserved for tree planting or pasture. The owners of these land may not get adequate income from these lands. Provision should be made to compensate them for this loss if they follow the scientific land-use plan. (ix) Arrangements should be made for the implementation of land development, nala bunding, small water storage and other schemes, included in the water-shed planning under the Employment Guarantee Scheme of the Government of Maharashtra.

(3) The Government must declare procurement prices in advance so that the farmers are assured of a definite return if they go in for pulses or oilseeds production. If the farmers desire to sell the produce to the Government at the declared prices, the government should buy the produce and make it available to the consumer through the public distribution system.

(4) The public distribution system for foodgrains should be strengthened and improved so that farmers feel assured of a regular and quality supply of basic cereals and pulses.

(5) The experimentation should be extended to different parts of the State as and when teams of small and marginal farmers are formed and proper land consolidation and land development are effected. The funds presently used for various schemes with small farmers as the target group can provide sustained long term benefits to the small and marginal farmer if comprehensive approach to planning and cooperative form of operation as suggested above is accepted.