

GOKHALE INSTITUTE MIMEOGRAPH SERIES NO. 32

---

**ROLE OF AGRICULTURAL EXTENSION IN THE  
MANAGEMENT OF DROUGHT AND IMPACT OF  
EXTENSION MESSAGES ON THE FARMERS**

---

**S. W. MURANJAN**

---

**AGRO ECONOMIC RESEARCH CENTRE  
GOKHALE INSTITUTE OF POLITICS AND ECONOMICS,  
PUNE 411 004**

---

**OCTOBER 1991**

## FOREWORD

Droughts are not infrequent in our country. More than anything else, the droughts have impeded our economic development in the past and if adequate measures are not taken up, droughts in the future may carry the same effects on the development. Drought in the assured rainfall zones has a larger impact on the economy than the droughts in the drought prone areas. Steps have, therefore, to be taken up to protect the level of production during a drought in the assured rainfall zones which are the permanent granaries for the supply of produce to the people.

The study presented in the foregoing pages examines the agricultural extension measures taken up by the Government in the drought prone as well as the assured rainfall districts of Maharashtra during the 1987-88 drought and it focusses attention on the above lacuna in the development process. Not much thinking has been done in the past to protect the level of production during the droughts in the assured rainfall zones and the emphasis has been on the Drought Prone Area Programmes in the drought prone districts only. Studies examining the agricultural extension aspects of a drought situation have been also rare. The present publication may, therefore, be useful to planners, administrators as well as researchers interested in the subject.

D.C.Wadhwa  
Director

## CONTENTS

	<u>Page</u>
FOREWORD	(i)
LIST OF TABLES	(iv)
 <u>Section</u>	
I	INTRODUCTION 1-4
1.1	Present Study 1
1.2	Objectives 1
1.3	Area Selection and Sampling 1
1.4	Outline of the Study 3
II	PROVISIONS EXISTING AND THE PREPARATIONS MADE TO MEET THE DROUGHT SITUATION 5-10
2.1	Provisions Existing and the Preparations Made at the District Collectorates 5
2.2	Provisions Made in the T & V Programme in the Districts 6
2.3	Contingency Plans for Bhandara and Wardha Districts 7
2.4	Preparations at the Zilla Parishad and the Block Levels 8
III	ROLE PLAYED BY THE EXTENSION AGENCIES IN THE MANAGEMENT OF DROUGHT 10-15
3.1	Role Played by the Zilla Parishads 10
3.2	Role Played by Ahmednagar Zilla Parishad 11
3.3	Role Played by Bhandara Zilla Parishad 12
3.4	Role Played by Wardha Zilla Parishad 13
3.5	Role Played by the Horticultural Departments in the Selected Districts 14

(iii)

<u>Section</u>		<u>Page</u>
IV	RESPONSE OF THE FARMERS TO THE STEPS UNDERTAKEN	15-23
4.1	Introduction	15
4.2	Farmers Having Knowledge about the Distribution of Seeds and the Farmers Actually Receiving the Seeds	16
4.3	Use of Seeds Received through the Seed Distribution Programme	18
4.4	The Cropping Changes in the Drought Year	20
V	OUTCOME OF THE RESPONSE	23-28
5.1	Preamble	23
5.2	Level of Input in the Drought and the Predrought Years	23
5.3	Level of Output in the Drought and the Predrought Years	26
VI	SUMMARY AND SUGGESTIONS	28-34

List of Tables

Table No.		Page No.
1	Number of Sample Households in the Selected Villages	4
2	Quantities of Seeds Estimated in the Contingency Plan and the Quantities Distributed in Bhandara District	12
3	Distribution of Seeds of Semi-rabi Crops through Zilla Parishad Funds	13
4	Distribution of Seeds under a Special Mini-kit Programme	14
5	Number of Sample Farmers having Knowledge about the Distribution of Seeds and Those Receiving the Seeds in the Drought Year	17
6	Number of Owner Cultivators Sowing the Seeds Distributed in the Drought Year	19
7	Cropping Pattern of the Cultivating Sample Households in the Drought and the Pre-drought Years	21-22
8	Inputs of Seed, Farmyard Manure, Fertilizers and Insecticides on the Farms of the Cultivating Sample Households in the Drought and the Pre-drought Years	24
9	Production of Principal Crops Grown by the Cultivating Sample Households in the Drought and the Pre-drought years	27
10	Value of Total Agricultural Production (Including Production of Mixed Crops and by-Products) on the Farms of the Cultivating Sample Households in the Drought and the Pre-drought Years	29

ROLE OF AGRICULTURAL EXTENSION IN THE  
MANAGEMENT OF DROUGHT AND IMPACT OF  
EXTENSION MESSAGES ON THE FARMERS

SECTION I

INTRODUCTION

1.1 Present Study

Present study is an extension of an earlier study on the 1987-88 drought submitted to the Directorate of Economics and Statistics, Ministry of Agriculture, Government of India in April 1990, under the caption "Impact of 1987-88 drought on the economic conditions of rural people in Maharashtra". In the proposal for the studies submitted to the Ministry, it was stated that the two studies viz., the study of the impact of drought and the study of the role of extension, would be conducted jointly in a sample of villages specifically drawn for the study of the impact of the drought, which was assigned to the Pune Centre in the meeting of the Agro-Economic Research Centres held at New Delhi. Present study is based on the proposal submitted to the Ministry after the meeting.

1.2 Objectives

The study examines the following four issues:

- 1) The provisions existing in 1987-88 in the selected districts to meet the drought situation,
- 2) The steps taken by the Collectorate and the Agricultural Department in the districts to meet the drought in 1987-88,
- 3) The manner in which the farmers responded to these steps, and
- 4) The outcome of the response from the farmers.

1.3 Area Selection and Sampling

The Government of Maharashtra declares a village as affected by the drought if the paisewari for the village as revealed through the crop estimation survey, is 60 paise or below in the drought-prone areas and 50 paise or below in

the other areas. In 1987-88, the Government had declared 6240 villages from 90 talukas in 13 districts as affected by the drought in the kharif season and 465 villages from 37 talukas in 9 of the same 13 districts as affected in the rabi season. Only about 14.7 per cent of the total number of 41,853 villages in the State were affected by the drought in the kharif season and 1.1 per cent, in the rabi season.

We selected the first three most affected districts among the 13 drought affected districts, by ranking the districts on the basis of the proportion of villages affected by the drought. These three districts as per the ranking are Bhandara, Wardha and Ahmednagar districts respectively and they together contained 46.6 per cent of the total number of villages affected by the drought in the kharif season and 65.2 per cent of the total number of villages affected in the rabi season.

All three districts were severely affected in the kharif season and Bhandara and Wardha, lying in the north eastern part, were also severely affected in the rabi season, as all the rabi villages in these districts were affected by the drought. Ahmednagar district, lying in the west-central drought prone area of the state, was affected only in the kharif season. We selected two most affected talukas from Bhandara and Wardha districts and one from Ahmednagar district as only two talukas in this district fell in the category of kharif talukas. The other talukas in the district fell in the category of rabi talukas and there was no drought in the area in the rabi season. The selected talukas are namely, Tumsar and Gondia from Bhandara district, Devali and Selu from Wardha district and Sangamner from Ahmednagar district.

Further, we selected two villages from each taluka, taking into account the size and the paisewari of the villages. The size of the two villages to be selected from a taluka, taken together and in terms of the households, was to be between

400 to 500 households per taluka, so that through a ten per cent random sample, it would be possible to study about 40 to 50 households per taluka. While selecting the two villages from a taluka, care was taken to select one village with a paisewari below 25 paise and the other with a higher paisewari. We thus, selected ten villages from the three districts, and by a ten per cent random sample in each village, we selected 219 households for the two studies. The details for the number of households in the selected villages have been noted in Table 1.

About three fifths of the sample households were engaged in the cultivation of land and the remaining were the non-cultivating households. As a matter of fact, these non-cultivating households were of no avail for the subject matter of the present study on the role of agricultural extension, but since the two studies were to be conducted jointly, the non-cultivating households could not be taken out from the sampling frame devised for a joint study. We have ignored these households for the purpose of the present study.

#### 1.4 Outline of the Study

After the present section to introduce the study, we have examined in Section 2, the provisions existing and the preparations made at the Collectorates, Zilla Parishads, Block Development Offices and the other departments, to meet the drought situation. In Section 3, we have noted the steps taken by the agencies to meet the drought situation and the targets they could achieve. The response from the farmers to their various steps has been examined in Section 4 and in Section 5, we have examined the outcome of this response. The study is summarized in Section 6.



Table 1 : Number of Sample Households in the Selected Villages

District	Block	Selected Villages	Paise-wari	Number of households in the selected villages	Number of households selected for the survey	Out of which	
						Number of households engaged in cultivation	Number of non-cultivating households
1. Bhandara	1. Tumsar	1. Mahegaon	13	212	22	18	4
		2. Mohadikhapa	10	290	30	24	6
	2. Gondia	1. Bajartola	20	162	17	12	5
		2. Paradibandh	10	250	27	21	6
2. Wardha	1. Devali	1. Palasgaon	41	162	17	11	6
		2. Takli (ch)	24	193	20	16	4
	2. Selu	1. Kotamba	44	197	20	14	6
		2. Kopara	17	229	25	22	3
3. Ahmednagar	1. Sangamner	1. Khanjapur	36	109	10	10	-
		2. Malunje	29	310	31	29	2
4. Total	-	-	-	2114	219	177	42

## SECTION II

PROVISIONS EXISTING AND THE PREPARATIONS  
MADE TO MEET THE DROUGHT SITUATION

2.1 Provisions existing and the Preparations  
made at the District Collectorates  
to Meet the Drought Situation

A Scarcity Branch was in existence in every Collectorate in the State but it became functional only when scarcity arose in a district. The staffing pattern in a Scarcity Branch varied with the severity of the scarcity conditions but generally only two temporary posts, one that of a Head Clerk and the other of a Clerk, were being created to administer the decisions taken at the Collectorate. Depending upon the quantum of work to be handled, the Scarcity Branch is expanded or at times is headed by a Tahsildar. During the present drought, the Scarcity Branch in Ahmednagar district was manned by a Mamlatdar, a Head Clerk and a clerk, that in the Wardha district by a Head Clerk and a Clerk whereas in the Bhandara district it was manned only by a Head Clerk. As a matter of fact, Bhandara ranked at the top on the basis of the ranking according to the proportion of villages affected by the drought in a district, and Wardha and Ahmednagar ranked the second and the third. But it appears, in Bhandara the work was managed only through a Head Clerk as no other person was posted in the Branch.

The Collector being the administrative Head of the district, all notifications about the drought were being issued through the Collectorate. The other Departments followed these notifications and the lists of drought affected villages and the paisewari therein as notified through the Collectorate. All major decisions regarding the measures to minimise the impact of the drought were being taken up by the Scarcity Committees formed by the Collectors. These Committees were represented by the MPs, MLAs, Zilla Parishad, Panchayat

Samitis, and the various Departments in the district and decisions were being taken regarding the matters pertaining to Agriculture, Animal Husbandary, Public Health, Employment, Food Supplies and Drinking Water. Since the present study is concerned only with the aspect of agricultural extension, we shall note hereafter only the steps taken up by the Agricultural Department, Zilla Parishad and Panchayat Samitis in the matter of agriculture.

## 2.2 Provisions made in the T and V Programme in the Districts

The Training and Visit Programme headed by the Principal Agricultural Officer in a district was the main agency for the extension of agricultural knowledge in the district. The Agricultural Department under the Zilla Parishad in a district was responsible mainly for the supply of inputs such as seeds, fertilizers, insecticides, improved implements and the others. However, since the supply of inputs was a crucial factor in agricultural production, the Zilla Parishads and the Block level officials were also an important component of the processes in extension.

The T and V Section in a district was responsible for preparing the Annual Agricultural Production Plan for a district. Such Agricultural Production Plans had been prepared for each of the selected districts and each district plan also contained a section on a contingency plan for the district, for contingencies arising out of delays in monsoon. Requirements of additional inputs of seeds of early varieties of the common crops or new crops were being estimated in such contingency plans for specific periodic delays in the monsoon such as a delay of a fortnight, or a month, two months etc. Since such Contingency Plans should have formed the basis of extension during the drought, we discuss these plans in some greater details below.

### 2.3 Contingency Plans for Bhandara and Wardha Districts

Bhandara and Wardha districts were extensively affected by the drought whereas there was drought only in the two kharid talukas in Ahmednagar district. Again its severity in the district was much less when compared to the severity of the drought of the previous year. Ahmednagar district was a drought prone area facing almost continual droughts, with a drought frequency ratio of 7:10. Since, planning for contingencies arising out of delays in rainfall had been a routine matter in Ahmednagar district, we have considered here the Contingency Plans only for the Bhandara and Wardha districts.

Paddy was the main crop of Bhandara district. The Contingency plan provided that if the rainfall in the district was delayed by a fortnight, no action would be necessary; if it was delayed by 30 days, 11857 quintals of seeds of the early varieties of paddy would have to be distributed; if the rainfall was delayed by 45 days, then 5534 quintals of jowar and safflower seeds would have to be distributed in the area and if the rainfall was delayed considerably, 25204 quintals of wheat and gram seeds would be required for the distribution. These estimates were based on the extents of areas that would suffer on account of the delays and they formed the basis of handling a drought situation as far as agricultural production was concerned. It was the practice to inform these estimates to the State Seed Corporation to be alert in the matter of seed supply, in case the rains were delayed.

Though there was a provision in the above plan for the Bhandara district to distribute the seeds of mid-season crops, like jowar and safflower, in the plan for the Wardha district, these aspects were completely ignored. Jowar and Cotton being the main crops of the area, contingency planning

was vaguely centred around these two crops only. If the rains were delayed by a fortnight, it was estimated, 2400 quintals of jowar seeds would have to be distributed; if there was a delay of 30 days, again 2400 quintals of additional jowar seeds would have to be distributed and if there was a delay of 45 days, then 2640 quintals of jowar seeds would be required for the distribution. Likewise for cotton, it was estimated that 6863 quintals and 4371 quintals of cotton seeds would be required for the distribution for delays over a fortnight and a month respectively, whereafter sowing of cotton would become impracticable. No thought was given to the possibilities of sowing any alternative crops even though such crops were possible in the area.

In general, the contingency planning in these two districts was of a routine nature and it was not backed by any experience in handling drought situations. Such plans shattered when a severe drought hit these areas.

#### 2.4 Preparations at the Zilla Parishad and the Block Levels

There being a drought in the previous year in the selected Sangamner taluka of Ahmednagar district, preparations had been already made to distribute seeds to the marginal and small farmers affected by the previous drought. The minikit programme was a handy programme available for the distribution of such seeds. Again, the taluka being a strictly kharif area as far as the dry lands were concerned, there was no need for any rabi planning in the area. A sizable area in the taluka had canal irrigation facilities which were functional whether there was a drought or otherwise. Hence, distribution of jowar and bajra seeds to those of the small and marginal farmers who had lost their crops in the previous year, was considered a step sufficient to mitigate the impact of such recurring droughts.

In Bhandara and Wardha districts, the situation was quite different. These districts were located in the assured rainfall zone of the state and the disappearance of rains in the earlier part of the season created a panic in these districts, especially for providing employment to the rural people.

It had rained somewhat less in July in Gondia and Tumsar blocks, the two selected blocks of Bhandara district but the rainfall was adequate to raise the seedlings of paddy. However, the rains disappeared at the time of transplantation of the paddy crop in the first fortnight of August. It rained only 2.18 cms., in the first fortnight of August as against 31.64 cms., in the first fortnight of August of the previous year in Gondia block and 5.10 cms., in the Tumsar block as against 35.28 cms., in the respective fortnight of the previous year. In the whole of August, it rained only 14.79 cms., in the Gondia block as against 33.11 cms., in the August of the previous year. It rained somewhat better in the second fortnight in Tumsar block but the paddy crop could not be transplanted and where it could be transplanted, it could not be irrigated for paucity of water in the ageold irrigation tanks. Only about a half of the paddy area could be transplanted but farmers were unwilling to harrow the drying transplanted crop and sow any other crop, as paddy was the principal kharif crop of the area. In August and September the Zilla Parishad and blocks advised the farmers to sow jowar and safflower as per the recommendations in the contingency plan, and gram and wheat later.

Rainfall in the second fortnight of June and the whole of July is crucial for the sowing and growth of crops in a jowar-cotton economy. In the Selu block of Wardha district, it rained only 3.70 cms., in the second fortnight of June as against 15.50 cms., in the second fortnight of the previous June and only 3.58 cms., in the whole of July as against 32.70 cms., in the July of the previous year. So also

in the Devali block of the same district, it rained only 5.86 cms., in the second fortnight of June as against 13.00 cms., in the second fortnight of previous June and 6.82 cms., in the whole of July as against 25.80 cms., in the previous July. The farmers had to sow the crops even twice or three in view of such deficient rainfall but the crops remained stunted for inadequacy of moisture in the growing period. Though not provided in the contingency plan, the Zilla Parishad advised the farmers to harrow the unsown lands and the dried crops and grow S.P.V. Jowar, Sunflower, Half-rabi Tur, Sesamum, Safflower and Mung, and later gram on these lands.

One thus, observes that adequate provisions did not exist in these assured rainfall districts to handle a drought situation and it created a panic when the drought became imminent. Only some patchwork was possible under such conditions as we will see in the following sections.

### SECTION III

#### ROLE PLAYED BY THE EXTENSION AGENCIES IN THE MANAGEMENT OF DROUGHT

##### 3.1 The Role Played by the Zilla Parishads

Agricultural extension was the main function of the staff of the T and V Section in a district, which was under the direct control of the Department of Agriculture at the state level. This work of extension was being done through the contact farmers and the village level workers as in a T and V Scheme. The Zilla Parishads were, however, responsible for the distribution of inputs required for agricultural production and the work was being carried out by the staff of the Agricultural Department posted under the Zilla Parishad. This staff viz., the Agricultural Development Officer and the other staff at the Zilla Parishad, as also the Agricultural Extension Officers at the block level, were involved in advising the farmers and extending methods in the management

of crops along with the distribution of inputs. They played an equally important role in extending the agricultural methods under the drought situation. We shall therefore, note their input distribution districtwise below.

### 3.2 Role Played by Ahmednagar Zilla Parishad

Since Ahmednagar district was prone to drought in 7 years in a decade, the extension for drought and the required input distribution had become a routine matter in this district. About 15 per cent of the cultivated area in the Sangamner taluka selected from the district was under irrigation and jowar and bajra constituted the principal crops on the dry lands. The distribution of jowar and bajra minikits to farmers upto 1 ha., holding was the only step being taken up in this taluka whenever there was a drought. However, this was being coupled with other measures such as redemption of land revenue and school fees and some concessions in Tagai loans etc., but in the matter of agriculture, distribution of minikits was the only short term measure to control the impact of the drought. In the year of study, a Special Minikit Programme was implemented through the Sangamner block for the purpose. The demand for the programme was estimated at 700 quintals of bajra seeds and 300 quintals of jowar seeds. Actually the Block received 332.10 quintals of bajra seeds and 300.50 quintals of jowar seeds. Out of these, 249.5 quintals of bajra seed was distributed among 16467 farmers in the block and 120 quintals of jowar seed among 3960 farmers. There was a short fall in the distribution of jowar seeds because the seed was received late in July. It was risky to sow jowar as late as in August as it was principally a kharif area. Any midseason or very short duration crops were not extended in the taluka.



### 3.3 Role Played by Bhandara Zilla Parishad

Bhandara district was mainly a paddy area, the paddy being grown by using the water from the old Malguzari tanks. If the rains delayed upto one month, there was a provision in the Contingency Plan for distributing paddy seeds as noted before. However, the rainfall was some what satisfactory in July to raise the seedlings but it disappeared at the time of transplanting the crop. There was no need to distribute paddy seeds at this late stage. Paddy seeds along with urea were already distributed before, under the general programme. The Scarcity Programme in the district, therefore, involved only the distribution of Rabi jowar, gram and Safflower seeds. The Contingency Plan had also provided for the distribution of wheat but wheat could not be provided by the supplying agency. The requirements of these seeds as estimated in the Contingency Plan and the quantities actually distributed have been noted in Table 2 below.

Table 2: Quantities of Seeds Estimated in the Contingency Plan and the Quantities Distributed in Bhandara District

Crop	Quantity distributed (Quintals)	Quantity estimated in the Contingency Plan (Quintals)
Jowar	3714.95	5534.00
Safflower	433.75	
Wheat	Nil	25204.00
Gram	8052.13	

One observes from the above figures that there was a considerable shortfall in the quantities distributed in relation to the quantities estimated in the Contingency Plan. These seeds were given free of cost to small and marginal farmers with unsown or non-transplanted lands. The targets set at the block level could not be achieved on account of the shortfall in the supplies. In one of the selected talukas,

viz., the Gondia taluka for example, against a list of 16802 farmers having such lands, only 11180 farmers could be supplied with these seeds.

#### 3.4 Role Played by Wardha Zilla Parishad

In Wardha district, the T and V Programme envisaged the distribution of only Jowar and Cotton seeds for varying delays in the monsoon. This was manifest through the distribution of minikits. But it was realized that this was not enough. So the Zilla Parishad, through its own funds, commenced the distribution of seeds of semi rabi crops such as Half-rabi, Tur, Sesamum and Safflower among the affected farmers on cash terms for the seeds of Tur and on 25 per cent subsidy for sesamum and 50 per cent for Safflower which was a new crop for the area. Some part of the Safflower seeds was given free of cost to the farmers. The quantities of these seeds distributed are noted in Table 3 below.

Table 3: Distribution of Seeds of Semi-rabi Crops through Zilla Parishad Funds

Crop	Seeds available (Quintals)	Seeds distributed (Quintals)
Tur (Half-rabi)	25.0	25.0
Sesamum	12.0	5.0
Safflower	25.0	25.0

The quantities of seeds made available through the Zilla Parishad funds were meagre. Seeds of Half-rabi Tur which was a new variety for the area and safflower, which was entirely a new crop, could be accepted readily by the farmers but sesamum seeds which were also locally available could not be lifted even with 25 per cent subsidy. These seeds were made available to all categories of farmers and it was

observed that in one of the selected blocks viz., the Devali block, in one instance, a Panchayat Samiti member received 40 kg. of safflower seeds free of cost under the scheme.

In addition to the above quantities of seeds, Gram and Safflower seeds were distributed among the small and marginal farmers having unsown or crop-failed lands under a special mini-kit programme with 100 per cent subsidy. The quantities of these seeds are noted in Table 4 below.

Table 4: Distribution of Seeds under a Special Mini-kit Programme

Crop	Estimated requirement (Quintals)	Quantity received (Quintals)	Quantity distributed (Quintals)
Gram	2100	2624.10	2454.65
Safflower	950	368.62	368.62

Quite some amount of seed was made available for the free distribution programme and the quantity of gram seed supplied, exceeded even its requirement estimated by the Zilla Parishad. These seeds were distributed among 17298 farmers holding 17235 ha., of cultivated land.

In addition, small quantities of seeds were also distributed by Panchayat Samitis through their funds in some blocks. In the Selu block for example, 2.20 quintals of sunflower, one quintal of S.P.V. Jowar and 0.39 quintal of Mung were distributed among the affected farmers besides some Tur.

#### 3.4 The Role Played by the Horticultural Departments in the Selected Districts

Horticultural crops are generally grown when the farmers are confident of their water supply over the years and hence such crops usually do not suffer much under drought conditions except for lowering of the production level in the

post drought year. There was no much of horticultural development in Bhandara district and fruit orchards in Ahmednagar district were developed around the canal irrigation system. There was, therefore no impact of the drought on the horticultural crops in Ahmednagar district.

In Wardha district, however, orange cultivation had thrived over the last few decades and the orange orchards were entirely dependent upon the supply of water through the wells. Recently, the farmers had expanded their orchards because of the rising profits from Nagpur orange cultivation, without considering the availability of water under adverse rainfall conditions. As a result, the Department estimated that about 30 per cent of the 12.5 lakh orange trees in the district were bound to perish or suffer heavily under the drought situation. Further out of the 4737 wells irrigating these orchards, about 1200 wells were required to be bored immediately to increase the availability of water. But in an inwell Boring Scheme taken up in 1983-84, it was observed that inwell boring could increase the water supply in only 3 of the 16 wells inbored. The Department was hesitant to take up such a scheme on a large scale. Finance was available from NABARD to take up such works but mostly all farmers were defaulters and hence no such proposal was also possible. The orchards had to be left to the mercy of nature.

#### SECTION IV

##### RESPONSE OF THE FARMERS TO THE STEPS UNDERTAKEN

#### 4.1 Introduction

We have noted in the preceding Section that quite some quantities of seeds of various crops were distributed by the Zilla Parishads and Panchayat Samitis to enable the farmers to resow their crops and grow the semi-rabi and rabi crops. In this Section, we shall examine how far the steps taken up by these agencies reached the selected villages and how many selected farmers could make use of the seeds provided. We shall also compare their cropping pattern in the drought year

with the pattern of the pre-drought year to ascertain their response to the use of seeds in the drought year.

#### 4.2 Farmers having Knowledge about the Distribution of Seeds and the Farmers Actually Receiving the Seeds

As noted before, the ten-per cent sample of households consisted of cultivating as well as non-cultivating households. Among the cultivating households, some households were cultivating their owned land, some had unofficially leased out their land and some others had unofficially leased in land. We have noted in Table 5 the number of owner cultivators, lessors and tenants in the sample having any knowledge about the seed distribution programme and also their number receiving seeds under the programmes framed to minimize the impact of the drought.

It appears from the data that all farmers were not aware of the seed distribution planned by the Zilla Parishads. On the whole only about half the number of farmers in the sample were aware of the measures taken up by the Government. It also appears that this degree of awareness was greater in villages with a lower paisewari than in villages with a higher paisewari. This means that the Gramsevaks had paid greater attention in this respect in the lower paisewari villages to tide over the drought situation. Like the owner cultivators, a few of the lessors in the sample were also aware of the seed distribution programme but the tenant cultivators who were officially not on the Gramsevak records, were ignorant of any measures being taken up by the Government to minimize the impact of the drought.

Mostly all owner cultivators in Bhandara and Wardha districts, having knowledge about the programme had received seeds and in all villages in Bhandara district and in one in Wardha district, their number even exceeded the number of cultivators having knowledge about the programme. But if we compare the number of owner cultivators receiving the seeds

**Table 5: Number of Sample Farmers having Knowledge about the Distribution of Seeds and Those Receiving the Seeds in the Drought Year**

District & village	Paise-wari	Owner cultivators			Owners leasing out land			Tenant cultivators		
		No. of cultivators	No. of cultivators having knowledge about the distribution of seeds	No. of cultivators receiving the seeds	No. of lessors	No. of lessors having knowledge about the distribution of seeds	No. of lessors receiving the seeds	No. of tenant cultivators	No. of tenant cultivators having knowledge about the distribution of seeds	No. of tenant cultivators receiving the seeds
<b>Bhandara</b>										
Bajartola	20	12	1	3	3	3	-	2	-	-
Mehegaon	13	18	9	15	2	1	1	2	-	-
Mohadikhapa	10	24	13	22	3	1	1	3	-	-
Paradibandh	10	21	12	21	3	2	2	3	-	-
<b>Wardha</b>										
Kotamba	44	14	5	3	1	1	1	5	-	-
Palasgaon	41	11	6	5	4	-	-	2	-	-
Takli	24	16	15	14	1	-	-	3	-	-
Kopara	17	22	9	11	2	1	1	1	-	-
<b>Ahmednagar</b>										
Khanjapur	36	10	7	3	-	-	-	-	-	-
Malunje	29	29	16	1	2	-	-	-	-	-

with their number in the sample, it would be observed that barring three villages in Bhandara district and one in Wardha district, not a very high proportion of owner cultivators had received the seeds in the other five villages. It is reasonable that in view of the scarcity of seeds only a small proportion of farmers might have received seeds as in Kotamba and Palasgaon in Wardha district, having a higher paisewari but it is improper that even in villages like Kopara in the same district and in Bajartola in Bhandara district, having a paisewari of 20 paise only, a small proportion of the farmers should receive seeds for resowing. In some villages lessors not cultivating their lands had received seeds whereas the tenants could not receive any seeds, for their not being on the official lists. In Ahmednagar district, the severity of the drought being much less than its severity in the preceding year, very few cultivators had received some seeds. They were the small and marginal farmers and had received seeds under the minikit programme.

#### 4.3 Use of Seeds Received Through the Seed Distribution Programme

The few lessors who had received seeds could not sow these, probably because under the agreement with their tenants, the tenants were to bear half of the cost of seeds. We shall, therefore, consider here the utilization of the seeds received by the owner cultivators only. The number of owner cultivators sowing the seeds received under the programme, and the type of seed received have been noted in Table 6.

Only in one village in Bhandara district, all the 22 owner cultivators had sown the seeds whereas in the other three villages, many cultivators could not sow the seeds for want of moisture in the soil as they reported. Rice, Jowar and gram seeds were distributed with the contention that rice could be sown where the seedlings had dried up, jowar could be sown as early as in August-September and gram in

September-October. Some cultivators had received either rice or jowar seed and the others, gram. Among those who had sown the seeds, a few experienced that the seeds could not even germinate for want of adequate moisture in the soil. At Paradibandh, for example, six cultivators had sown jowar but only in three cases, it germinated. Nine cultivators had sown gram but in two cases it could not germinate.

Table 6: Number of Owner Cultivators Sowing the Seeds Distributed in the Drought Year

District and Village	Number of cultivators receiving the seeds	Number of cultivators sowing the seeds received	Type of seed received	Reasons for not sowing
<u>Bhandara</u>				
Bajartola	3	-	Rice and Jowar	
Mehegaon	15	6	Rice, Jowar and Gram	
Mahadikhapa	22	22	Rice, Jowar and Gram	
Pardibandh	21	15	Jowar and Gram	
<u>Wardha</u>				
Kotamba	3	3	Jowar, Tur, Gram, Sunflower, Mung and Udid	
Palasgaon	5	4	Jowar, Tur, Gram	
Takli	14	11	Jowar, Gram, Safflower	
Kopara	11	8	Jowar	
<u>Ahmednagar</u>				
Khanjapur	3	3	Jowar and Bajra	
Malunje	1	1	Bajra	

In Wardha district, on the contrary, a relatively large proportion of the owner cultivators had sown the jowar and tur seeds supplied to them. Gram was also supplied in three of the villages and sunflower and safflower in one village each. All the three cultivators receiving the seeds in Kotamba were the big farmers and they had sown all the types of seeds supplied to them. At Palasgaon, two had



received only Tur Seeds but one did not sow the seeds whereas the other three had received Jowar Seeds which were sown promptly. In the other two villages also jowar was sown but none had sown gram. The cultivator receiving Safflower at Takali, had sown the seeds but the crop was a total failure on his farm.

The few cultivators receiving the minikits of jowar and bajra seeds in Ahmednagar district had utilized the seeds properly. On the whole it appears that barring the cultivators in the Bhandara district, the cultivators in the other two districts had responded well to the seed distribution programme. However, the programme could not cover all the sufferers for paucity of seeds and in many instances they could receive only one type of seed, despite their system of multiple cropping. In Bhandara district, the moisture level in the soil being very low and jowar and gram being relatively uncommon crops of the paddy area, farmers could not make a fuller use of the seeds.

#### 4.4 The Cropping Changes in the Drought Year

We shall now examine their cropping pattern in the drought year and compare it with their cropping pattern of the previous year to know how far their cropping changed on the one hand by the drought and on the other, by the extension measures. The cropping pattern of the cultivating sample households is noted in Table 7 for the drought and the pre-drought years.

One would observe from the Table that the areas of traditional crops had generally gone down to varied extents in the sample villages and some non-traditional crops had come up as a result of the extension efforts of the Government. In Bhandara district, the area under paddy had declined in every village because of the drought but the areas under wheat, jowar and gram had gone up because of the extension efforts. Wheat and jowar were grown to a small extent even in the pre-drought year in these villages but jowar had come up entirely as a new crop in two of these villages.

Table 7 : Cropping pattern of the cultivating sample household in the drought and the pre-drought years

District and Village	Paise-wari	Paddy (Ha)		Jowar (Ha)		Bajra (Ha)		Wheat (Ha)		Gram (Ha)		Cotton (Ha)		Sugarcane (Ha)	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B
		<b>Bhandara</b>													
		*	**												
Bajartola	20	37.58	45.27	-	-	-	-	-	-	-	-	-	-	-	-
Mehegaon	13	23.77	34.50	11.43	0.40	-	-	4.45	1.52	2.53	0.20	-	-	0.25	-
Mohadikhapa	10	19.10	25.27	2.83	-	-	-	3.74	1.42	1.89	0.20	-	-	0.25	0.25
Paradibandha	10	28.36	31.39	1.36	-	-	-	6.17	3.24	1.67	0.20	-	-	-	-
<b>Wardha</b>															
Kotamba	44	1.11	1.21	23.11	21.04	-	-	4.05	6.27	-	0.40	21.28	25.32	1.21	1.82
Palasgaon	41	1.32	1.92	22.79	23.11	-	-	2.12	3.34	0.40	0.20	26.28	29.02	2.02	0.50
Takali	24	-	0.60	18.82	16.60	-	-	3.84	4.05	12.14	5.67	42.71	49.59	0.81	-
Kopara	17	0.40	-	25.17	24.76	-	-	2.83	3.03	1.82	2.23	39.05	42.29	-	-
<b>Ahmednagar</b>															
Khanjapur	36	-	-	8.51	5.97	14.90	16.52	0.40	-	0.46	-	-	-	-	-
Malunje	29	-	-	31.60	24.97	66.68	65.76	2.02	1.82	0.81	0.61	-	-	0.40	0.81

\* Out of the area, 1.62 ha was under Rabi paddy and the remaining under kharif paddy

\*\* Out of the area, 5.67 ha was under Rabi paddy and the remaining under kharif paddy

(Contd.)

Table 7 : (Contd.)

District and Village	Paisewari	Area under crops							
		Pulses other than Gram (Ha)		Groundnut (Ha)		Other oilseeds (Ha)		Vegetables and Fruits (Ha)	
		A	B	A	B	A	B	A	B
<u>Bhandara</u>									
Bajartola	20	-	-	-	-	-	-	-	-
Mehegaon	13	0.60	1.42	-	-	1.42	0.50	-	-
Mohadikhapa	10	3.64	5.87	-	-	-	-	-	-
Paradibandha	10	-	-	-	-	-	0.40	-	-
<u>Wardha</u>									
Kotamba	44	0.81	0.95	1.92	2.83	2.53	1.21	1.21	0.40
Palasgaon	41	1.62	1.21	2.02	-	-	-	0.81	0.80
Takali	24	2.43	0.40	-	-	4.25	3.44	-	-
Kopara	17	2.63	1.62	0.20	0.20	0.40	0.81	-	-
<u>Ahmednagar</u>									
Khanjapur	36	-	-	-	-	-	-	-	-
Malunje	29	0.29	-	0.20	0.40	0.20	-	2.04	1.63

A - Drought Year

B - Pre-drought year

In Wardha district, the area under cotton had declined in every village because of the drought, as the crop required sowing before the end of June. Jowar could be sown even upto the end of July and hence the area under the crop had even marginally gone <sup>up</sup> in three of the villages. The area under paddy and wheat which are the two minor crops of the area, had gone down during the drought year whereas the area of gram had gone up substantially in one of the villages namely Takali because of the extensive distribution of gram seeds. The area under Tur, Groundnut, and other oilseeds had also gone up for the same reasons but the area of such minor crops was almost negligible. There were no noteworthy changes in the cropping in the villages in Ahmednagar district, both years being the drought years.

## SECTION V

### OUTCOME OF THE RESPONSE

#### 5.1 Preamble

We have noted in the preceding sections, the extension measures taken up by the Government to reduce the impact of the drought on the farmers, and the response of the farmers to the steps taken up. In this section, we shall note the final outcome of the steps taken up and the response of the farmers as could be viewed through the changes in the input and output structures. This could be done by comparing their input and output structure of the drought year with the structure of the previous year and ascertain the shortfalls if any in the levels of inputs and outputs despite the steps taken up.

#### 5.2 The Level of Input in the Drought and the Pre-drought Year

We have noted the inputs of seeds, farm yard manure, fertilizers and insecticides on the farms of the sample households, during the drought and the pre-drought years in Table 8,

Table 8: Inputs of seed, farmyard manure, fertilizers and insecticides on the farms of the cultivating sample households in the drought and the pre-drought years

District and village	Seeds (Kg)				Farmyard manure (cart loads)				Fertilizers(Kg)				Insecticides (Value Rs.)					
	Home produced		Obtained free		Purchased		Home produced		Purchased		Obtained free		Purchased		Obtained free			
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B		
<u>handara</u>																		
Bajartola	4410	5175	-	-	40	190	268	313	-	-	-	-	3900	5675	-	-	311	536
Mehegaon	3076	4229	139	-	70	200	155.5	330	-	-	-	-	200	3065	-	-	-	66
Mohadikhapa	2716	3312	100	-	270	17	198.5	234	-	-	-	-	750	1610	-	-	-	-
Paradibhandh	3576	3970	128	-	200	51	378	418	-	3	-	-	1900	2490	64	-	-	163
Total	13778	16686	367	-	580	458	1000	1295	-	3	-	-	6750	12840	64	-	311	765
<u>ardha</u>																		
Kotamba	404	326	63	6	620	940	351	365	-	15	-	-	12880	14678	-	-	6958	7737
Palasgaon	456	287	25	15	481	628	58	78	5	10	100	100	9725	9730	-	-	4604	5259
Takli	538	678	243	3	1737	461	194	217	20	10	-	-	9125	10200	-	-	13177	17150
Kopara	452	481	41	24	639	556	209	230	2	-	-	-	9825	11475	-	-	6756	9275
Total	1850	1772	372	48	3477	2585	812	890	27	35	100	100	41560	46078	-	-	31495	39421
<u>Ahmednagar</u>																		
Khanjapur	112	77	5	-	140	155	163	132	21	20	75	-	1160	825	-	-	107	115
Malunje	354	365	8	-	866	644	404	339	-	10	50	160	1000	1325	30	15	30	-
Total	466	442	13	-	1006	799	567	471	21	30	125	160	2160	2150	30	15	137	115

A = Drought Year

B = Pre-drought Year

to examine if there was a decline in the level of inputs. The Table indicates that the input of seeds which included home produced, purchased and obtained-free seeds had gone up for the sample farmers in Wardha and Ahmednagar districts and this was so on account of the additional seed required for resowing of crops. There was on the contrary, a reduction in the input of seeds in the paddy growing Bhandara district because of the need for timely sowing of paddy. This decline, however, took place in spite of the free distribution of paddy seeds through the Extension Agency, which means that the seeds were not used for sowing.

The input of farm yard manure had generally gone down in the villages in Bhandara and Wardha districts but it had gone up in the villages in Ahmednagar district, which could be due to the use of farm yard manure accumulated with the farmers during the previous years of drought. The input of fertilizers had declined by about 50 per cent in Bhandara district for the reasons that paddy could not be transplanted in some instances, and also it could not be properly irrigated for inadequacy of water in the irrigation tanks. There was a reduction of only about 10 to 15 per cent in the use of fertilizers in the villages in Wardha district whereas the input of fertilizers remained at about the same level as in the previous year in the villages in Ahmednagar district. Barring the paddy growing Bhandara district, there was not much decline in the use of fertilizers in the other districts. The extension measures in Bhandara district, could not thus, succeed in promoting any alternative cropping pattern as would restore at least to some extent, the normal input of fertilizers. The use of insecticides had gone down in Bhandara and Wardha districts but it had gone up in Ahmednagar district. Insecticides were being used only on a small scale in Bhandara district because paddy was relatively less susceptible to pests and diseases. Insecticides were required

to be used on a large scale for hybrid jowar and cotton in Wardha district but the crops in some instances being in a crippled state, it is likely that the farmers have used fewer insecticides despite the effort of the extension agencies.

### 5.3 The Level of Output in the Drought and the Pre-drought Years

We can compare the output in the drought and the pre-drought years firstly by comparing the physical output of the main crops in these two years, and secondly by comparing the value of the total output including the output of the other minor crops, in the same two years. We have noted in Table 9, the output per hectare of paddy, wheat, jowar, cotton and bajra on the farms of the sample households in different districts in the drought and the predrought years and also compared these outputs with the farmers' normal expectations of yields with a normal rainfall either on the same or similar type of land on their farms, as revealed by the farmers themselves. Such a comparison with the normal expectations can reveal the extent to which even the predrought year deviated from the normal.

The table reveals that except for one village with a somewhat higher paisewari, the output of paddy was very low in the other three villages in Bhandara district. There was likewise a shortfall in the output of even wheat and local jowar. The output of wheat in one village was higher than the output of the crop in the pre-drought year as the crop had received irrigations during the drought year but still it was only 30 per cent of the normal expectations from the same type of land. The extension measures in this district thus, could not succeed in bringing about any radical change <sup>restoring</sup> in the yields.

The same may be said for the jowar and the cotton crops in Wardha districts. The yields varied with the paisewari for the villages in the district, irrespective of the Government efforts in restoring yields. Only the output of wheat was

Table 9 : Production of Principal Crops Grown by the Cultivating Sample Households in the Drought and the Pre-drought Years

District and Village	Paise-wari	Production per hectare (Quintals)		Percent actual production when compared to the production in the normal year		Production per hectare (Quintals)		Percent actual production when compared to the production in the normal year		Production per hectare (Quintals)		Percent actual production when compared to the production in the normal year	
		A	B	A	B	A	B	A	B	A	B	A	B
<u>Bhandara</u>													
- P A D D Y -													
Bajartola	20	12.53	19.39	48.60	79.08	-	-	-	-	-	-	-	-
Mehegaon	13	0.10	11.54	6.41	77.45	1.93	0.99	29.38	50.25	1.22	15.00	23.83	85.71
Mohadikhapa	10	5.54	15.95	33.45	80.27	0.92	2.82	13.24	53.41	0.30	-	42.00	-
Paradibandha	10	3.89	17.86	18.73	82.49	2.64	5.03	32.27	65.16	-	-	-	-
- W H E A T -													
- J O W A R (LOCAL)													
<u>Wardha</u>													
- J O W A R (HY)													
Kotamba	44	10.80	13.52	47.45	60.90	3.77	5.58	38.12	55.30	13.33	12.76	65.83	66.11
Palasgaon	41	4.25	6.70	24.05	41.69	1.93	4.30	22.65	51.81	8.73	13.47	46.26	64.27
Takali	24	2.97	9.03	16.35	45.77	2.29	4.81	23.68	48.10	9.38	12.35	72.04	56.83
Kopara	17	2.47	9.35	13.06	53.46	1.42	3.93	18.61	48.34	6.01	13.20	37.80	81.63
- C O T T O N -													
- W H E A T -													
<u>Ahmednagar</u>													
- J O W A R (LOCAL)-													
Khanjapur	36	5.76	3.77	36.57	34.09	3.49	2.85	26.01	34.83	17.50	-	70.00	-
Malunje	29	2.62	2.08	18.52	13.74	1.70	1.06	14.74	9.30	5.94	4.67	25.53	18.88
- B A J R A (LOCAL) -													
- W H E A T -													

A = Drought Year

B = Pre -drought Year



relatively better in this district because of the irrigations made available to the crop during the drought year.

The drought being relatively less severe in the villages in Ahmednagar district, the output of jowar bajra and wheat was relatively better in the drought year.

We have noted the value of the total agricultural output on the farms of the sample households in the drought and the predrought years in Table 10. The Table clearly indicates that there was a substantial decline in the value of the total output in Bhandara and Wardha districts even when the output of all other crops extended in these districts is taken into account. This shown that the extension measures taken up in these districts proved to be only some relief measures benefiting only some individual farmers on a small scale. If the impact of a drought has to be reduced to a much greater extent, extension measures have to be planned on some different lines to train and benefit the entire farming community.

## SECTION VI

### SUMMARY AND SUGGESTIONS

Present study was planned as an extension of our earlier study on the 1987-88 drought submitted to the Directorate in April 1990, under the caption "Impact of 1987-88 drought on the economic conditions of rural people in Maharashtra". The same households sampled for the earlier study were approached with additional questions to meet the requirements of the present study. The study is based on a sample of 177 households of the cultivating families in five talukas from three selected districts, and it examines the provisions existing in a district to meet a drought situation, the extension measures taken up to meet the drought of 1987-88, the manner in which the farmers responded to these measures and the outcome of the response from the farmers.

Table 10 : Value of Total Agricultural Production (Including Production of Mixed Crops and by Products) on the Farms of the Cultivating Sample Households in the Drought and the Pre-drought Years

District and Village	Paisewari	Total Value of Agricultural Production (drought years) (Pre-drought years)		Percentage increase or decrease in the production in the drought year over the production in the pre drought year	
				% increase	% decrease
<u>Bhandara</u>					
Bajartola	20	97175	169728	-	42.75
Mehegaon	13	12843	97934	-	86.39
Mohadikhapa	10	34149	83495	-	59.10
Paradibandha	10	29650	115604	-	74.35
<u>Wardha</u>					
Kotamba	44	207982	242488	-	14.23
Palasgaon	41	103951	156814	-	33.71
Takali	24	175497	250783	-	30.02
Kopara	17	68460	203832	-	56.60
<u>Ahmednagar</u>					
Khanjapur	36	33735	22892	47.37	-
Malunje	29	114966	81415	41.21	-

A Scarcity Branch was in existence in every Collectorate in the State to deal with the problems arising on account of the drought but it became functional only when scarcity arose in a district. The Collector being the administrative head of a district, all notifications pertaining to a drought were being issued through him. All major decisions regarding measures to minimize the impact of the drought were being taken up by a Scarcity Committee formed by the Collector and represented by the MPs, MLAs, Zilla Parishads, Panchayat Samitis and various departments in the district.

The Training and Visit Programme headed by the Principal Agricultural Officer in a district was the main agency for the extension of agricultural knowledge in the district. The Agricultural Department in the Zilla Parishad was responsible only for the supply of inputs, The T and V section was also responsible for preparing the Annual Agricultural Production Plan for a district, which contained a Contingency Plan for contingencies arising out of varying time delays in the monsoon. Such Plans were prepared in the Annual Production Plans for the selected districts but they being of a routine nature without any background experience of handling a drought situation, the plans shattered when a severe drought hit these areas.

Ahmednagar district being a drought-prone area having a drought frequency ratio of 7:10, administration of drought had become a routine matter for the various agencies in the district. Bhandara and Wardha districts being, on the contrary, located in the assured rainfall zone of the State, the administration was not well prepared to meet the drought situation. The disappearance of rains in the earlier part of the season created a panic in these districts, and the Zilla Parishads and the Panchayat Samitis had to take special measures to minimize the impact of the drought on the agricultural production through distribution of seeds.

In Bhandara district which was a paddy area and which was very severely affected by the drought, the Zilla Parishad could not distribute even those quantum of seeds of Jowar, Safflower, Wheat and Gram, estimated in the Contingency Plan. Wheat could not be procured from the supplying agency even though it was included in the Contingency Plan.

In Wardha district, the Contingency Plan envisaged the distribution of only Jowar and Cotton seeds, the two staple crops of the district and no thought was given to the distribution of the seeds of mid-season and rabi crops. The Wardha Zilla Parishad had, therefore, to distribute seeds of Half-rabi Tur, Sesamum, Safflower and Gram through its funds but the quantities which could be distributed were meagre in relation to the size of the drought. The Panchayat Samitis in Wardha district also distributed seeds of Sunflower, S.P.V. Jowar, Mung, etc., but the whole quantum of distribution was small since the Contingency Plan had rested only on the distribution of seeds of the two staple kharif crops. There was no provision for saving the orange crop in the Contingency Plan for the Wardha district and the crop had to be left to the mercy of nature because even deepening of wells was not possible by issuing credit to the orange cultivators who had become defaulters.

It was observed from the study of the sample households that only about half the number of farmers were aware of the seed distribution programmes taken up by the Government. The degree of awareness was, however, greater in villages with a lower paisewari than in the villages with a higher paisewari, which means that the village level workers had paid a greater attention in this respect in the lower paisewari villages where the drought situation was severe. Mostly all owner cultivators, having knowledge about the seed distribution programmes, in the Bhandara and Wardha districts, had received

seeds either for resowing or for sowing of unsown lands. However, in the total, barring three villages in Bhandara district and one in Wardha district, not a high proportion of cultivators could receive the seeds.

Except in one village in Bhandara district, many cultivators in the other three villages could not sow the seeds for want of moisture in the soil. In many a cases, the seeds could not even germinate. In Wardha district, on the contrary, a relatively large proportion of the cultivators had sown the seeds, and in Ahmednagar district the seeds were utilized very properly.

Barring the cultivators in the Bhandara district, the cultivators in the other two districts had thus, responded well to the seed distribution programme. However, the programme could not cover all sufferers for paucity of seeds and in many a cases, they could receive only one type of seed, despite their system of multiple cropping.

The area of traditional crops on their farms had gone down because of the drought but the area under the non-traditional crops could go up because of the distribution of the non-traditional seeds. The input of seed had also gone up in Wardha and Ahmednagar districts on account of the distribution of seeds but the input of seeds had gone down in Bhandara district in view of the need for timely sowing of paddy. This reduction took place in spite of the distribution of seeds which means, the seeds received by the farmers were not used for sowing. The input of farm yard manure, fertilizers and insecticides had also gone down because of the drought. There was a substantial decline in the physical output of the principal crops as well as a substantial decline in the total value of the crops which included the crops newly extended in the area for the drought. This shows that the extension measures taken up in these districts proved to be only some relief measures benefitting a few farmers on a small scale;

they failed to restore any normalcy in these areas.

In view of such a failure, extension for drought has to be planned on some different lines to train and benefit the entire farming community. Let us examine what could be done to achieve this end.

Droughts can be classified under two types. The one resulting from the disappearance of rains in the earlier part of the season as in the case of the drought which is the subject matter of the present study, and the other resulting from a disappearance of rains in the later part. We shall consider here only the drought of the first type.

At present there exists an administrative build up to tackle a drought only in areas which are prone to drought like the Ahmednagar district in our sample, where management for drought takes a routine form. But in the assured rainfall zones, no mechanism is kept ready to tackle a drought situation as the droughts are very infrequent in these areas. Greater emphasis, therefore, needs to be laid henceforth on tackling a probable drought situation in the assured rainfall zones which are the permanent granaries for the supply of agricultural produce to the people. Not as much a drought in the drought prone areas as a drought in the assured rainfall zones that carries all possible impacts of a drought on the economy of our country.

Very comprehensive cropping patterns have, therefore, to be developed and kept ready to tackle a drought situation of the first type, involving various delays in the rains in the earlier part of the season. These cropping patterns have to be such as would restore normalcy in the form of returns to the cultivators even during a drought year and these should have been fully demonstrated, explained and taught to the farmers every year, even during a normal year, so that they could be readily adapted according to the changes in the dates of sowing. The early, mid-season and the new crops

should form the basis of such cropping patterns and cereal and millet production should be ensured through their adaption.

Adequate stocks of seeds have to be kept ready in each district for such cropping patterns and the supply of seed input should be handled on a war footing in these areas, whenever there is a drought. If there is no drought in a year, the untreated seeds may be distributed for consumption through fair price shops by the end of the rains. The seeds should be stored without treating these against the pests and diseases and the seeds should be treated only at the time of distribution for sowing. Some relationship should be established for the purpose between the buffer stocks in the country and the seed stocks in a district. There is no alternative but to protect these granaries of agricultural produce in the assured rainfall zones through such sound drought control measures every year, to stabilize the economy of our country.

# Some of the Gokhale Institute Publications

## GOKHALE INSTITUTE STUDIES

1. Writings & Speeches of Prof. D. R. Gadgil on Co-operation : 1975, pp. viii + 296, Rs. 30.
2. Employment Guarantee Scheme - An Employment Opportunity for Women : Kumudini Dandekar. 1983, pp. 76, Rs. 25.
3. Drought in Maharashtra 1972 - A Case for Irrigation Planning : Sulabha Brahme. 1983, pp. xiii + 146, Rs. 60.
4. Irrigation Utilisation in the context of Protective and Productive Irrigation in Maharashtra : Ashok K. Mitra. 1990, pp. 101, Rs. 100.
5. Indian Economics : Some Theory Some Practice : N. V. Sovani (in press).

## ARTHA VIJNANA REPRINT SERIES

1. Income, Saving and Investment in Agriculturally Progressive Areas in Ahmednagar District, Maharashtra State (1969-70 to 1971-72) : M. P. Khare. 1977, pp. 138 Rs. 15.
2. Economic Benefits of Rural Electrification in Maharashtra : A Study of Four Districts : A. K. Mitra and S. W. Muranjan. 1981, pp. vi + 186, Rs. 50.
3. Management of Social Forestry in Maharashtra : S. W. Muranjan. 1987, pp. 113-119, Rs. 50.
4. Planning and Management of Surface Irrigation in Drought Prone Areas : Ashok K. Mitra. 1987, pp. 305 - 422, Rs. 60.

## MIMEOGRAPH SERIES

1. Evaluation Study of Integrated Rural Development Programme (Sangli District) : Sudhakar Gadam. 1986, pp. 280, Rs. 125.
2. Study on the Utilisation of Kharif Irrigation Potential in Five Agro-Climatic Zones of Maharashtra : A. K. Mitra. 1987, pp. 250, Rs. 66.
3. Economics of Dairying with Crossbred Cows in Western Maharashtra : D. P. Apte. 1987, pp. 236, Rs. 80.
4. Evaluation Study of Minor Irrigation Schemes in Maharashtra State with Special Reference to Drought Prone Areas of Beed and Osmanabad Districts of Marathwada Region : C. S. Gajarajan. 1988, pp. 130, Rs. 60.

Price Rs. 35