

EVALUATION STUDY OF THE CENTRALLY SPONSORED  
SCHEME OF ASSISTANCE TO SMALL AND MARGINAL  
FARMERS FOR INCREASING  
AGRICULTURAL PRODUCTION

IMPACT OF A TARGET GROUP DEVELOPMENT PROGRAMME

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## PREFACE

The present study was taken up at the instance of the Ministry of Agriculture, Government of India, with an objective to examine the impact of various programmes under the Scheme of Assistance to Small and Marginal Farmers for Increasing Agricultural Production on the rural economy. Though there are three components, i.e., minor irrigation, land development and minikit distribution, in the centrally sponsored scheme, the Government of Maharashtra modified the scheme covering two programmes. They are comprehensive Watershed Development Programme (COWDEP) and minikit distribution. Of these two, COWDEP takes a major share (90 per cent) of the funds. Hence, our main concern was to analyse the design and impact of these two programmes at three different levels, i.e., State level, block level and beneficiary level. The preliminary work on this project was started in April, 1989, subsequently field work began in September 1989 and completed by November 1989.

In the course of this study, we have indebted to many people who have helped in many ways. Our greatest debt in completing this study is to those sample farmers who patiently answered our gruelling questions. We are grateful to Prof. V.S. Chitre, Director, for his encouragement and help during the course of the work. Our thanks are due to the Officers at the Department of Agriculture, Pune, who took pains to provide

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## CHAPTER I

### TARGET GROUP DEVELOPMENT PROGRAMMES : AN ANALYSIS OF DESIGN AND IMPLEMENTATION

#### I.1 Introduction

The developmental strategies of mid 60's for poverty and unemployment have brought forth the problems of distribution and long run sustainability of the growth rates. These exclusively technology based strategies are most unlikely to succeed consistently in the future. It was noted that growth in crop production was more confined to the better endowed regions and classes. Apart from this, the failure of 'trickle down' gave rise to the target group specific approach in the policy. Consequently, there was a deliberate shift in the agricultural growth strategy involving added emphasis on dry land farming and special programmes for the less endowed classes.

The small and marginal farmers formed the core of this target group because of two reasons. Firstly, this group of cultivators were not a part of the mainstream of the 'Green revolution' and second that they are an inseparable part of the poor strata. Increased agricultural production as well as sustainability of growth is only possible with an increased productivity on the lands of these less endowed groups. This group assumes importance in the growth strategy both due to their numerical strength (majority falling below poverty line) and the proportion of area held by them. Both these factors

coupled with lower productivity on their lands and the meagre surplus generated are causing greater concern.

A quick analysis of the problems concerning the less endowed cultivators would show that this group mainly involves small and marginal farmers and also operates on dual constraints. Firstly, their holdings are tiny and mostly un-irrigated, requiring investment in land development work. Secondly, it is the access to resources (HYV seeds, fertilizers, pesticides, irrigation, etc.) that delays their adoption of the new technology.<sup>1</sup> This in gist suggests that this group has constraints in the form of capital for land shaping, minor irrigation, purchase of inputs, and technical knowhow. Keeping these constraints in view various programmes were designed to help the group of small and marginal farmers.

### I.3 The Scheme

Government of India launched a 'Centrally Sponsored Scheme for Assisting the Small and Marginal Farmers for Increasing Agricultural Production' involving an outlay of Rs. 250 crores with the central share of Rs. 125 crores during 1983-84. The share of Government of India was subsequently revised down to Rs. 35 crores for assisting the small and marginal farmers in all IRD blocks. Government of Maharashtra in its resolution (No. MPA-1083/1984/CCD-43/9-A) dated 8th June 1985 indicated an outlay of Rs. 610 lakhs with a matching

the  
1 Dantwala, M.L., In/Introduction to PG Joshi's book on Institutional Aspects of Agricultural Development, Allied, New Delhi, 1987.

share from the Central Government. The scheme proposed an amount of Rs. 5 lakhs per block as detailed below<sup>2</sup>:

<u>Programme</u>	<u>Amount</u> (Rs. in lakhs)
1. Minor Irrigation/Water recharging measures (COWDEP)	3.5
2. Fuel and fruit tree plantation	0.5
3. Minikits of Seeds and Fertilizers for Oilseeds and Pulses	1.0
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	5.0
	-----

Given this broad allocation, the State Governments were given flexibility to divert funds from one component to the other within a block but it was made clear that the outlay of Rs. 5 lakhs per block should not be changed and that the componentwise proportion of investment 7:1:2 among minor irrigation, tree planting, minikits and land development be retained at district level.

In Maharashtra, the Government resolution of 8th June, 1983 kept the componentwise allocation same with a slight deviation from the original guidelines in the case of minor irrigation. Government of Maharashtra chose to use the funds under 'minor irrigation' for Comprehensive Watershed Development Programme (COWDEP) under operation in the state since 1982 (Government of Maharashtra resolution of planning department No. EGS=1083/pl/D-33 dated 20.7.1982). Though

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<sup>2</sup> Government of Maharashtra, Resolution of the Department of Agriculture and Cooperation (No. MPA-1083/19841/CCD-43/9-A) dated 8th June 1983.

this meant a diversion from the scheme as envisaged by Central Government, in the context of Maharashtra it needs a fuller discussion. We shall be devoting a section in the present chapter for this discussion. Before we analyse this issue, we shall discuss briefly the operations of the programme at State level over the last six years.

Government of Maharashtra in the opening paragraph of its resolution termed the scheme as a massive programme of assistance to small and marginal farmers and that name 'massive' was carried through the subsequent references in the official circles. The programme is always referred to as 'massive' programme in the State Government official circles. The programme was implemented through Directorate of Agriculture with the responsibility shared by Soil-Conservation and Input wings. At taluka (block) level the implementing authorities were the Sub-Divisional Soil Conservation Officer and the Block (Sub-DISCO) Development Officer (BDO). The Comprehensive Watershed Development Programme (COWDEP) was handled by soil conservation people whereas, the seed and fertilizer minikits were the responsibility of the BDO.

### I.3 State Level Analysis

The scheme had two phases<sup>3</sup> as far as the implementation

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<sup>3</sup> We have grouped the period into two phases because in January 1986 revised guidelines were issued under this programme to the State Governments. These guidelines changed the allocation for 'minikits' from Rs. 1 lakh/block to Rs.0.5 lakhs/block and a new component under land development was included with an allocation of Rs. 1 lakh/block.

is concerned. In the first phase only two components namely minor irrigation (COWDEP) and minikits were being operated. This phase covered first three years of the scheme (1983-84, 1984-85 and 1985-86). Expenditure was incurred only on minor irrigation (COWDEP) during the first year. The total expenditure incurred on COWDEP during these three years was Rs. 31.12 crores as against Rs. 5.43 crores on minikits. It may be noted that the share of the State Government was slightly higher during 1984-85 and 1985-86 (see Table 1.1(A)).

Table 1.1(A) : Expenditure Incurred on Massive Programme : Phase I

Sr. Components No.	1983-84	1984-85	1985-86
<b>1. Minor Irrigation (COWDEP)</b>			
Central Shares	450.77	518.00	518.00
State Share	450.77	645.07	529.32
Total	901.54	1163.07	1047.32
<b>2. Minikits</b>			
Central Shares	-	140.53	130.78
State Share	-	140.53	130.78
Total	-	281.06	261.56

Notes : 1. Data collected from Directorate of Agriculture, Government of Maharashtra, Pune

2. Total of Central and State Share vary because of rounding off.

Table 1.1(B) : Expenditure Incurred on Massive Programme :  
Phase II

Sr. Components No.	(Expenditure in lakhs)		
	1986-87	1987-88	1988-89
<b>1. Minor Irrigation (COWDEP)</b>			
Central Share	420.27	454.58	-
State Share	420.27	454.58	-
Total	840.54	909.17	-
<b>2. Land Development</b>			
Central Share	133.73	137.43	148.00
State Share	133.73	137.43	166.82
Total	267.47	274.86	314.82
<b>3. Minikits</b>			
Central Share	60.14	63.35	67.64
State Share	60.14	63.35	67.64
Total	120.29	126.71	135.78

Notes : 1. Data collected from Directorate of Agriculture,  
Government of Maharashtra, Pune

2. Total of Central and State Share vary because  
of rounding off.

During the second phase 'additional massive' programme was taken up for implementation. This was nothing but resumption of the land development component of the centrally sponsored scheme. In this phase also the State share of expenditure was slightly higher than the Central share (see

Table 1.1(B)). The total expenditure during this phase was Rs. 29.89 crores. Of this, about Rs. 26 crores were spent on COWDEP, which included expenditure on "Massive" and "Additional Massive".<sup>4</sup> It was only during 1986-87 and 1987-88 the programme had all the components in operation in the state. In the first phase, the fuel and fruit tree plantation was undertaken along with minor irrigation under COWDEP only, whereas during the second phase funds for land development and minor irrigation were together utilized for COWDEP. Out of the six years under review, per block expenditure for four years was in the range of Rs. 4.15 to Rs. 4.87 lakhs. For 1983-84, the expenditure was Rs. 3.04 lakh, because the other two components were not in operation.

The ratio of expenditure on each component for 1986-87 and 1987-88 (for which all the three components were in operation) works out to be 7:2:1 as stipulated between minor irrigation (COWDEP), land development and minikits. For the other years, this ratio could not be checked since all the components were not in operation during those years. In fact, during 1983-89 the Central Government added to the minor irrigation component of the programme for (eight states) shallow tubewells/dugwells under the special foodgrains

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4 Massive: Scheme of COWDEP taken from the funds under minor irrigation.

Additional Massive: Land development component apart from minor irrigation.

production programme.<sup>5</sup> It may be noted that this was in addition to the minor irrigation component of the massive programme and hence, an added emphasis was laid on minor irrigation in some districts of the State.

#### I.4 Utilization of Minor Irrigation Funds Under CO/DEP

As noted earlier, Government of Maharashtra chose to utilize the funds allocated under 'minor irrigation' for CO/DEP. We shall look into the background of this decision. Initially, the component under minor irrigation also included land development. Moreover, certain level of flexibility was allowed in blockwise reallocation within a district. However, during March 1985, Government of Maharashtra sought clarification from Central Government about modification in sectoral re-allocation.

A letter from the Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India No. 23-13/83 CA.V dated 30th July 1989 gave clearance to club minor irrigation and land development under CO/DEP. Accordingly, the programme continued till 1987-88. But in the GR No. MPA-1088/CR-34/9-4 dated 3rd May 1988, when sanction was accorded to the Rs. 5 lakh per block with minor irrigation, land development and minikits, it was noted that 'As regards the orders regarding utilization of amount of minor irrigation component will be issued later on'. This was probably because, Government of Maharashtra was trying to make a case with Government of India for utilization of funds from this

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<sup>5</sup> Government of India, Department of Agriculture Circular No. 23-35/88-CA.V dated 9th May 1988.



scheme for COMDEP. Government of India, in its letter dated 15th February 1988, had given five conditions under which the funds for minor irrigation can be utilized for COMDEP, these were as follows:<sup>6</sup>

1. The expenditure on minor irrigation and land development should not exceed 90% of the amount administratively approved in a particular year.
2. Land development and minor irrigation works on watershed basis may be undertaken in such watersheds where more than 50% of the land holders are small and marginal farmers and they own not less than 25 per cent of the land. The total number of farmers covered under community land development works/minor irrigation works should not be less than 10. No bulldozers/heavy tractors be employed for top soil movement. The land development programme may include limited land smoothening to improve in-situ moisture conservation, contour key line interception, bunds construction and bread furrow farms across the slope and key line formation with vegetative barriers.
3. The Government of India would share 50:50 basis with the State Government that portion of the cost of such land development works/minor irrigation works which is apportionable to the lands of small and marginal farmers benefited thereby.
4. Where the community minor irrigation works entail distribution of water as in the case of lift irrigation scheme, water rates should be charged from all farmers but in case of marginal and small farmers, the water rate should be 50 per cent of the rates to be fixed for other farmers. The agency for collection and retention of such water charges should be the same as far as possible as would maintain the community minor irrigation works.
5. The cost of Comprehensive Watershed Development apportionable to the lands of farmers other than small and marginal farmers may be recovered from the beneficiaries in full as per norms for development of land, and irrigation fixed by NABARD.

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6 Government of India, Ministry of Agriculture, letter No. 23-1/87/CAV dated 15th February 1988.

It is necessary to review the respective position of the State and the Centre, with respect to the scheme. Maharashtra is one of the cronicly drought-prone states with more than 88 talukas identified as drought-prone (Fact Finding Committee Report, 1973). Minor irrigation, in general, and well irrigation in particular, are the programmes already on priority list of the State Government. The outlay on minor irrigation is about 30 per cent of the total outlay on irrigation and flood control. This is in addition to the various schemes in operation both on behalf of the State Government and the banking sector. At the same time, it should be realised that there are limitations to the availability of groundwater. According to the IVth revised Groundwater Assessment Survey - (1985), 34 watersheds fall under the dark zone (over exploited) and 80 watersheds come under grey zone (on the verge of over-exploitation). This is quite an alarming situation though it is not a uniform phenomena across districts. There are some districts (mostly in the assured rainfall zone) having good groundwater potential, but these are climatically in a favourable place and hence minor irrigation alone cannot be their top priority even for the small and marginal farmers. In fact, proper land and water management to conserve in situ moisture, the plugging of natural streams, nallas and water harvesting structures should be the priority in these areas. This would not only provide higher moisture regimes but also enhance the groundwater potential.

Proper land and water management also features in a part of the guidelines for implementation of the centrally sponsored scheme of assistance to small and marginal farmers for increasing agricultural production (paragraphs 5.1 and 5.2, pages 4 and 5 and para 5.13 (I to IV)).<sup>7</sup> Moreover, the problem of Maharashtra is typical in its own way. It involves a dichotomy between drought prone and non-drought prone districts. The drought-prone districts, where minor irrigation can be taken up have the problem of dark and grey watersheds. Whereas, in the non-drought prone districts in situ conservation of water should receive higher priority than minor irrigation. Hence, watershed development over all the blocks may be the most suitable programme to be taken under 'massive' scheme as a blanket programme in place of specifically tailored programmes for regions.

The guidelines also indicate in para 5.3 that the amount provided for 'minor irrigation' be utilized as subsidy for the loan taken by beneficiary from institutional sources. This means that a potential beneficiary may have to invest amount in the range of Rs. 15 to 16.5 thousands. Studies on institutional finance have amply demonstrated that, with uncertain groundwater conditions, climatic risks and low value crop

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7 Government of India, Revised Guidelines for Implementation of the centrally sponsored scheme of assistance to small and marginal farmers for increasing agricultural production, Ministry of Agriculture, New Delhi, January 1983.

pattern, investment to that tune is always hazardous.<sup>8</sup>

This discussion leads to the conclusion that COWDEP is a suitable programme in the State of Maharashtra in place of Minor Irrigation. But, we would hasten to suggest that both the alternatives be kept open so that this decision can be taken based on the requirement of the block as rightly pointed out in the guidelines of para 5.1. Hence, the decision to alter or modify the programme should be taken at the State Government level. A blanket programme would not necessarily prove beneficial to small and marginal farmers. Or, in other words, may not necessarily lead to an increase in production on the lands of small and marginal farmers.

COWDEP is an area development programme and small watersheds join together to form a larger watershed and hence, it would be difficult to choose watershed with concentration of small and marginal farmers. In the State about 57 per cent of the total number of holdings belong to small and marginal farmers and hence, though a direct beneficiary approach is not followed, it can be comfortably assumed that about 57 per cent of the beneficiaries of COWDEP would be small and marginal farmers. But this needs to be carefully checked across state.

#### I.5 Objectives and Methodology

The above paragraphs tried to highlight the suitability of COWDEP as compared to minor irrigation in Maharashtra. We shall also have a closer look at the operational aspects of

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<sup>8</sup> R.S.Deshpande, et al, Expost Evaluation of Dry Well Investments in Hard Rock Areas of Bijapur, Research Report, Institute for Social and Economic Change, Bangalore, 1986.

the programme in the subsequent analysis. Given that in Maharashtra the 'massive' programme had two major components, namely, COWDEP and MINIKITS till 1987-88, we shall endeavour to analyse the impact of these programmes on farm households.

Our objectives for the present study are as follows :

1. To study the extent and coverage in terms of beneficiaries and area under the major components of the programme.
2. To what extent the programme has helped in changing the cropping pattern in favour of pulses and oilseeds.
3. To assess the distributed varieties and their diversification across regions.
4. To analyse the impact of various components of the scheme.
5. To document various constraints in operationalising and administration of the scheme and find ways and means to meet such constraints.

We plan to work at three levels in the analysis of the problem. The present chapter mainly deals with the implementation and departure of the scheme from ex-ante presumptions at State level. It is followed by a State level analysis of the programme. The second chapter would deal with the analysis of the data collected from the selected blocks in the state. For the selection of block, we have followed two stage sampling. In the first stage, we grouped all the

blocks of the state into nine agro-climatic zones. We have selected thirty-four blocks randomly from each agro-climatic zone in proportion to the number of blocks falling under each agro-climatic zone (see Table 1.2). A block level schedule was sent to each selected block to get the impact of the scheme separately for COWDEP and Minikits. In the third chapter we have analysed the responses of the beneficiaries of the programme. After selecting two blocks randomly falling in two different agro-climatic zones, we have taken the COWDEP watersheds falling in the block. A beneficiary schedule was canvassed for the COWDEP beneficiaries. Similarly, another structured schedule was canvassed for the beneficiaries of minikit programme. We have selected equal number of beneficiaries from COWDEP and MINIKIT programmes.

#### I.6 Magro-Level Analysis

Before we get into the analysis of the implementation of massive programme at block and beneficiary level, it is necessary to analyse the design of the Central Government programme in the set up of the State and the achievements at State level. Implementation of a programme is as crucial as the design of it. It is essential that the design of any developmental programme offers sufficient flexibility keeping in view the spirit rather than in letters. In the following sections, we are analysing the problems of the programme and its achievements in the state.

Maharashtra is a State with a large number of small and marginal holdings. Almost 57 per cent of the operational holdings come under the small and marginal farmers group, but the area held by them is only 20 per cent of the total. There is of course a large variation across regions within the state. In Table 1.3, we have presented the proportion of number of holdings and area held by the weaker sections. The number of small and marginal holdings range from 45 per cent in Amravati to 72 per cent in Konkan region. Similarly, area held by this group of cultivators ranges between 16 & 33 per cent for Pune and Kolhapur respectively. Whereas, SC and ST farming households are concentrated in Nagpur, Amravati and Nashik districts.

The variations in distribution makes it clear that there is no uniformity in the spread of target groups (SF & MF, SC & ST farmers). In such case, if the funds of a developmental programme are distributed uniformly (viz. Rs. 5 lakh per block irrespective of the concentration of target group), then its impact would be skewed across blocks/districts/regions. A block with higher number of target group would get the same amount of funds as that of the block with lower number. This would mean lower per capita developmental expenditure or limited coverage per year. This would need a longer time span development of the underdeveloped blocks as compared to the other blocks. Creating such an imbalance between target groups of different regions, cannot be an expected result.

We also worked out location ratios for small and marginal farmers and SC and ST farmers for all the districts of the State in order to locate concentrated pockets of target groups.

Table 1.2 : List of the Selected Blocks

Sr. No.	Agro-Climatic Zone	No. of Blocks Selected	Name of the Block	District
1.	Very High Rainfall Zone with Laterites	2	Khed Mahasala	Ratnagiri Raigad
2.	Very High Rainfall with non-lateritic soils	3	Kalyan Mokhada Roha	Thane Thane Raigad
3.	Ghat Zone	1	Panhala	Kolhapur
4.	Transition Zone (I)	2	Shahuwadi Suragana	Kolhapur Nashik
5.	Transition Zone (II)	2	Igatpuri Taloda	Nashik Dhule
6.	Scarcity Zone	6	Srigonda Purandhar Sangola Ashti Mohol Khatav	Ahmednagar Pune Solapur Beed Solapur Satara
7.	Assured Rainfall Zone	7	Dhatukali Aurangabad Paithan Patoda Soygaon Nandura Latur	Ahmednagar Aurangabad Aurangabad Beed Aurangabad Buldhana Latur
8.	High Rainfall Zone with soils from Mixed Parent Material	3	Salekasa Arjuni Bhandara	Bhandara Bhandara Bhandara

contd.



Table 1.2 : contd.

Sr. No.	Agro-Climatic Zone	No. of Blocks Selected	Name of the Block	District
9.	Moderate Rainfall Zone	4	Nanded Mingoli Risod Hadgaon	Nanded Parbhani Akola Nanded
10.	Additional blocks selected	5	Khultabad Nandgaon Dahivadi Bhopegao (Watershed) Shirur	Aurangabad Nashik Satara Satara Pune

Table 1.3 : Proportion Distribution of Small, Marginal and Scheduled Caste and Scheduled Tribe Cultivators in Maharashtra 1985-86

(Percent to total)

Sr. No.	Division	Proportion of Small and Marginal Farmers		Proportion of SC Farmers		Proportion of ST Farmers	
		No. of Hold-ings	Area	No. of Hold-ings	Area	No. of Hold-ings	Area
1.	Amaravati	45	17	10	7	7	3
2.	Aurangabad	46	18	8	6	2	2
3.	Kolhapur	75	33	9	5	0.0	0.1
4.	Konkan	72	23	5	3	8	9
5.	Nagpur	53	20	13	10	12	12
6.	Nashik	52	20	5	4	19	18
7.	Pune	51	16	8	6	4	4
8.	Maharashtra State	57	20	8	6	7	7

Source : Government of Maharashtra, Agricultural Census, 1985-86

The location ratio was computed as follows :

$$\text{Location Ratio of } i\text{th district} = \frac{\text{PTG}_i/\text{TH}_i}{\text{PTS}/\text{THS}}$$

$\text{PTG}_i$  = Size of holding or area of target group in  $i$ th district

$\text{TH}_i$  = Total number of holdings or area in the  $i$ th district

PTS = Size of Total holdings or area of target group in the State

THS = Total number of holdings or area in the State.

The location ratio will be unity if the proportion of target group in a district is equal to that of the State. In other words, if the district represents characteristic of the State, then the location ratio (LR) would be unity. Higher concentration of target group would result in location ratio higher than unity. Taking the allocation of funds under massive scheme at Rs. 5 lakhs per block, we arrived at the district-wise allocation of the funds. We further classified the districts into two groups by taking a dividing line at Rs. 55 lakhs. Districts were further cross tabulated with those having high or low concentration of (represented by location ratio) target group.

It may be noted from the Table (1.4) that there are quite a few cases, where the concentration of target group is high but the allocated funds are much below the Rs. 55 lakh mark. On the other hand, there are more number of districts where target groups have lower concentration but the allocated

Table 1.4 : Classification of Districts According to Level of Allocation and Concentration of Target Group

Sr. No.	Target Group	Concentration *	(No. of Dists. in each Cell)	
			Allocation of Funds	
			Below Rs.55	Above Rs. 55
1.	Small and Marginal Farmers	High	5	5
		Low	11	8
2.	SC Farmers	High	5	7
		Low	11	6
3.	ST Farmers	High	10	6
		Low	6	7

\* High concentration - Location ratio exceeding units  
 Low concentration - Location ratio less than units

funds exceed Rs. 55 lakhs. This is the basic flaw in the design of the programme, which may result in inter-district disparities in the development of target groups. In other words, this would mean relatively lower allocation of the funds to the regions with higher concentration of target groups and vice versa.

We have worked out rank correlations between the funds allocated and concentration (indicated by location ratios) across the districts. The results are presented in Table 1.5. It may be observed from the table that none of the correlations are significant,<sup>9</sup> which means that the allocation

<sup>9</sup> Except one with area held by ST farmers, but this is more due to outliers in the group rather than the group behaviour.

Table 1.5 : Rank Correlations between Funds Allocated and Concentration of Target Group

Target Group		Correlation Coefficient	
Small and Marginal Farmer	Number	0.27	Not significant
	Area	0.28	Not significant
SC Farmers	Number	0.15	Not significant
	Area	-0.03	Not significant
ST Farmers	Number	-0.20	Not significant
	Area	-0.36	Significant at 5%

of funds per district have no direct relationship with the concentration of target group. At this place, we underscore the point that there is a basic flaw in the design of the scheme at the Centre.

We shall now take up the normative impact part of the design of the scheme in the case of Maharashtra. In other words, we are trying to analyse below the impact of the scheme provided it is implemented as given by the guidelines. This will be followed by an analysis of the actual impact of the scheme at State level.

As far as the direct impact of the benefits is concerned the distribution of minikits comes first. Maharashtra Government has the minikit component under various programmes like NODP, OPTP, NPDP, Krishi Pandhari, etc. The scheme has a substantial amount allocated and also covers large number of beneficiaries. At the level of beneficiary, there may be

difficulties in administering the programme but at macro level (at State level) its implementation has no obvious problems. The only possible distortion again is the equated allocation of funds to each block irrespective of the concentration of the target group.

Distribution of minikits have a three pronged function. Firstly, it enables the target group an easy access to the technology package with seeds, fertilizers and know-how. Secondly, it easens the market barriers on the new inputs by subsidising them. Thirdly, it promotes cropping pattern in favour of crops like oilseeds/pulses. The first two functions are built <sup>in</sup> in/the programme but it is futile to hypothesize any change in the cropping pattern in the absence of supporting price incentives and access to other inputs. The price support was tried successfully during seventies in coastal Andhra Pradesh for cotton.<sup>10</sup>

As an exercise, we tried to work out the benefited area under minor irrigation given the allocation of Rs. 3.5 lakhs per block, in order to compare this with the probable benefits derived from COWDEP. The total allocation at State level would be about Rs. 1050 lakhs. If 25 per cent subsidy is given to the small and marginal farmers for digging well, the total number of feasible wells with subsidy would be 20,304 at the unit cost prescribed by FABARD. Table 1.6 gives the number of feasible wells and the per cent of rainfed area of target group irrigated.

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<sup>10</sup> V.N. Reddy, "Pattern of Commercial Farming in Guntur District", Economic and Political Weekly, 21-28 December, Vol. 20, Nos. 51 and 52, 1985.

Table 1.6 : Number of Feasible Wells and Proportion of Area Irrigated for Small and Marginal Farmers with the Given Investment

Sr. Division No.	No. of Feasible Wells at 25% Subsidy (Nos.)	Proportion of Area Irrigated of Small and Marginal Holdings with the additional wells (%)
1. Amaravati	4124	0.41
2. Aurangabad	2864	0.78
3. Kolhapur	1992	0.55
4. Konkan	2676	0.80
5. Nagpur	4044	1.70
6. Nashik	2240	0.93
7. Pune	2364	0.89
8. Maharashtra State	20304	0.96

It can be observed from the table that about 1 per cent area of the small and marginal farmers can be brought under irrigation with an investment of about Rs. 4 thousand lakhs. This would also create a debt burden of about Rs. 3 thousand lakhs per year and an equal provision of credit from banking industry. Apart from these marginal benefits, the long run sustainability of well irrigation (given the groundwater availability in Maharashtra) as well as the correct identification of beneficiaries by the banking institutions pose greater problems. On the other hand, if COMDEP programme is undertaken as an alternative, it would cover about 42 thousand hectares

of area in a year (at the unit cost prevailing in the State which are under revision). Table 1.7 gives the anticipated area to be covered under COWDEP.

Table 1.7 : Estimates of the Area Covered Under COWDEP with the given investment

Sr. Division No.	Area in Hectares which can be covered under COWDEP
1. Amravati	9553
2. Aurangabad	7363
3. Kolhapur	6217
4. Konkan	3968
5. Nagpur	3241
6. Nashik	5948
7. Pune	5422
8. Maharashtra State	42210

Though the proportion of area covered under COWDEP is not substantial relative to the total area under operational holdings, the benefits fall in the perview of long term strategy of proper land and water management. This programme will not only provide higher moisture availability but also seasonal employment to the small and marginal farmers. The programme also includes components like nalla bunding and small water harvesting structures, contour bunding to increase in situ moisture conservation, social forestry, horticulture, etc. Hence, it has multipronged benefits as compared to minor irrigation programme.

### I.7 Achievements Under Massive Programme

As indicated in the initial paragraphs, this programme is in operation in the State since 1983-84. Both the components of the programme viz., distribution of minikits and COWDEP, have quite impressive achievements to their credit. During the period of four years, i.e., 1985-86 to 1988-89, the Government of Maharashtra distributed through its department 27 lakh minikits. This means that about the same number of beneficiaries (not counting those who have taken it twice in the same year) have taken advantage of the scheme. Or, in other words, about 3 lakh hectares of area was covered during these years under new seeds.

The achievements under COWDEP are presented in Table 1.8. Contour or graded bunding has dominated the achievements both because of their priority as water conserving structures and the low unit cost. But, most of the contour bunding work was done during 1988-89 and there cannot be any other justification except the availability of funds during that year. The achievements under land shaping and grading are also quite consistent over the years. This is followed by terracing, which is a problem of only certain areas in the state.

Three specific observations can be made about the componentwise achievements of the programme. Firstly, nalla training has received quite low priority both in expenditure and coverage. One can understand the coverage because large area is not involved in this work but then the expenditure



Table 1.3 : Physical Achievement Under CCW.DSP

(Figures in thousand Hects/Mos.)

Sl. Components No.	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	Total
1. Contour/Graded Bunding (CB)	1,27	93	73	73	75	8,78*	1,324
2. Fella Bunding (Nos.)	9	5	7	6	7	3	37
3. Terracing	10	12	13	13	17	9	74
4. Land-Dev-cum-Hort.Dev. Mango	3	3	3	3	3	11	26
Cashew	1	1	1	1	1	2	7
5. On Farm Dev. Afforestation and Grass-Plantation	5	3	9	7	9	20**	58
6. Land Shaping/Grading	26	31	43	49	56	13	218
7. Broad Bed. Furrows	1	1	0	0	0	0	2
8. Wall Training (Nos.)	1	0	1	0	0	0	1
9. Maintenance	33-CB	34-CB	30	13	15	14	139
10. Reclamation of ill drain soils	1	1	1	1	1	0	5
11. Repairs of work due to heavy rains	-	4	0	0	0	0	4

- Note : 1) \* Including Contour ploughing (Directive lines and Vegetative bunds).  
 2) \*\* Pre-monsoon achievement..  
 3) 0 Indicates negligible (below 500)  
 4) Achievement belongs from all sources of funds.

should have clearly indicated the priority. Secondly, broad bed furrows which should be complimentary to contour bunding has also received relatively less emphasis. Thirdly, it would have been beneficial had the achievements in nalla bunding are given in terms of irrigable area rather than number of structures.

### I.8 Summary

The Centrally Sponsored Scheme of Assistance to Small and Marginal Farmers to Increase Agricultural Production (MASSIVE) is in operation in the State since 1983-84. Maharashtra Government chose to take up Comprehensive Watershed Development Programme (COWDEP) instead of "minor irrigation" as a component of the overall programme. Our analysis indicates that minor irrigation would have carried miniscule benefits to the target group. Moreover, in the hard rock areas of Maharashtra the ultimate irrigation potential itself is not very high. Large areas are falling under dark and grey zones according to groundwater exploitation levels. In such situation, soil and water conservation becomes the top priority programme of the State government. COWDEP is a suitable alternative to it. We have also analysed in detail the basic design of the Massive scheme, which shows that allocating equated funds to the block would in turn perpetuate the regional imbalances. It would be beneficial, in the spirit of the programme, to give freedom about the schemes to State government. In such case, the State can prepare a set of zonewise schemes for all the blocks of the

state and sanction may be accorded by central government under the overall scheme. However, the benefits should in no case flow towards the non-targeted groups. In the light of this, it is necessary to introduce some minor changes in the implementation of COMDEP. This and other related aspects are discussed in forthcoming analysis.

APPENDIX

Table 1 : Districtwise Allotment of Funds, Location Ratios, Area Covered Under Watershed Development and Area Under Well Irrigation.

District	Total Allotment (In Rs. lakhs)	Location Ratios of						Area brought under watershed development* (Ha)	Area that can be brought under well irrigation** (Ha)
		SF+MF		SC		ST			
		No.	Area	No.	Area	No.	Area		
1. B.S.D.	-	1.65	3.30	1.51	3.22	1.86	4.80	-	-
2. Thane	65	1.27	1.28	1.33	1.28	1.22	1.08	1200	408
3. Raigad	70	1.38	1.59	1.24	1.41	1.39	1.34	1292	872
4. Ratnagiri	45	1.15	0.85	1.09	0.87	1.40	1.33	830	720
5. Sindhudurg	35	1.34	0.98	1.31	1.29	1.62	2.19	646	436
Konkan Division	215	1.27	1.10	1.05	1.13	1.24	1.10	3968	2676
6. Nashik	65	0.87	0.80	0.90	0.74	0.89	0.77	2148	408
7. Dhule	50	0.93	1.10	0.74	0.61	1.06	1.41	1652	624
8. Jalgaon	65	1.00	1.17	1.09	1.30	1.16	1.60	2148	408
-Nashik Division	180	0.93	1.00	0.96	0.88	0.99	1.10	5948	2240
9. Ahmednagar	65	0.97	1.18	1.10	1.05	0.96	0.79	1855	408
10. Pune	70	1.02	0.92	1.06	0.97	1.01	0.77	1998	872
11. Solapur	50	0.71	0.58	0.81	0.63	0.83	0.75	1570	684
-Pune Division	190	0.92	0.90	0.97	0.88	0.98	0.78	5422	2364
12. Satara	55	1.36	1.78	1.01	1.72	1.56	2.41	2137	684
13. Sangli	45	1.9	1.30	0.69	1.30	1.06	1.38	1749	560
14. Kolhapur	60	1.46	2.81	2.35	1.91	1.75	3.45	2331	748
Kolhapur Division	160	1.35	1.67	1.34	1.58	1.64	2.67	6217	1992
15. Aurangabad	40	0.87	0.97	0.92	1.02	1.10	1.41	1368	496
16. Jalna	25	0.81	0.85	0.94	1.11	1.08	1.39	854	312
17. Parbhani	35	0.79	0.84	0.92	1.04	0.91	0.98	1197	436
18. Beed	35	0.89	0.88	1.05	1.25	1.08	1.14	1197	436
19. Nanded	40	0.82	1.04	0.74	0.84	0.78	0.90	1368	496
20. Osmanabad	30	0.64	0.59	0.95	0.95	1.17	1.55	1095	372
21. Latur	25	0.68	0.63	0.90	1.02	1.29	1.12	855	312
Aurangabad	230	0.80	0.84	0.85	0.95	0.95	1.07	7863	2864
22. Buldhana	65	0.88	0.92	0.91	1.00	0.46	0.85	2343	1012
23. Akola	65	0.81	0.85	0.91	0.31	0.83	0.78	2343	1012
24. Amaravati	65	0.96	1.04	0.99	1.41	0.66	0.58	2343	1012
25. Yavatmal	70	0.58	0.59	0.63	0.62	0.69	0.69	2524	1088
Amaravati Division	265	0.81	0.84	0.88	0.94	0.70	0.67	9553	4124
26. Wardha	35	0.79	0.15	0.78	0.79	0.94	1.23	436	544
27. Nagpur	70	0.82	0.86	0.75	0.70	0.88	0.94	872	1088
28. Bandera	65	0.78	2.00	1.31	1.89	1.42	1.96	810	1072
29. Chandrapur	50	0.90	0.86	0.85	0.79	0.98	1.02	623	776
30. Gadchiroli	40	1.05	1.22	1.03	1.11	0.93	0.88	499	624
Nagpur Division	260	1.03	1.09	1.01	1.01	1.08	1.15	3241	4044
<b>Maharashtra</b>	<b>1500</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	<b>1.00</b>	<b>42210</b>	<b>20304</b>

\* Estimated with the help of per hectare cost of watershed development - with the allocation of Rs.3.5 lakhs per block for COWDEP.  
 \*\* Central government allots Rs.3.5 lakhs per block towards minor irrigation. If this amount is spent on silt digging wells @ each well irrigates 1 ha. approx. what would be the actual area that can be irrigated with wells.

## CHAPTER II

### MESO LEVEL IMPACT OF THE SCHEME

Analysis of the scheme at state level indicates that the formulation should have taken into account the peculiarities of the State. The allocation of funds on the basis of blocks (Rs. 5 lakh per block) do not bear any relationship with the regional concentration of target groups. As a result, larger funds are likely to be available in the pockets with lesser concentration of target groups. Which may lead to perpetuation of inter-regional inequalities in long run. The State government has suitably altered the scheme to the geo-climatological conditions of the State, by taking up Comprehensive Watershed Development Programme (COMDEP) in the place of minor irrigation component. As indicated in the earlier chapter, we are attempting here an analysis of the two schemes for the selected 34 blocks. We have opted for block level analysis because of two reasons. Firstly, the allocation of funds is made keeping block as a unit and secondly, both the schemes<sup>1</sup> are implemented by block level officials viz., Block Development Officer (BDO) and Sub-divisional Soil Conservation Officer (Sub-DISCO). Hence the analysis of implementation at block level would be useful for the evaluation of the scheme and understanding its impact.

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<sup>1</sup> Scheme of distribution of minikits and development of a comprehensive watershed.

For the selection of blocks, we followed stratified random sampling and grouped all the blocks of the State into nine agro-climatic zones. Out of these, we have selected thirty-four blocks randomly from each of the agro-climatic zone in proportion to the total number of blocks falling under each of the zones. This list of blocks was finalised after the discussions with Officers from State Government.<sup>2</sup> A structured schedule was sent to BDO for the relevant information pertaining to the block and distribution of minikits. Another separate schedule was sent to the Sub-Divisional Soil Conservation Officer for the data regarding implementation of the programme.

The first schedule provided data about the cropping pattern, land use, coverage of the target groups, expenditure on minikits, etc., while the second schedule gave information about type of watershed development activities, coverage, expenditure, employment generated, achievements, etc. Out of the 68 schedules, we received 49 schedules and 19 block level officials did not send the information even after 6th reminder over a period of 4 months. Hence the analysis includes only 49 schedules, of which 27 schedules are from Sub-DISCO and 22 schedules from BDO.

### II.1 Spread of the Target Group

As indicated earlier the selected blocks span across the

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<sup>2</sup> We are grateful to Dr. J.Y. Patil, Additional Director, Directorate of Agriculture, Government of Maharashtra and his colleagues in the department.

State and representation for every agro-climatic zone of the State is given. These blocks cover totally about 33.56 lakh hectares of geographical area and 9.6 lakhs of rural population. The Scheduled Caste and Scheduled Tribe population form 18.74 per cent of the total rural population. Among the cultivators, 5.4 lakh are small and marginal farmers and 1.4 lakh are scheduled castes and scheduled tribe cultivators.<sup>3</sup> Table 2.1 presents proportion of small and marginal farmers in the total number of holdings and the share of area operated by them.

Table 2.1 : Distribution of Holdings and Area Operated among Target Groups

Sr. Target Group No.	Proportion to total number of holdings	Proportion of area operated to total operated area	Average size of holding (in ha.)
1. Marginal Farmers	30.9	5.6	0.49
2. Small Farmers	24.7	13.6	1.48
3. Scheduled Caste Farmers	7.6	5.1	1.82
4. Scheduled Tribe Farmers	6.7	6.6	2.68

Source : Agricultural Census, 1985-86, Government of Maharashtra, Pune, 1989.

<sup>3</sup> Government of Maharashtra, Report of the Agricultural Census, 1985-86, Directorate of Agriculture, 1989.

We have also presented the proportion of scheduled caste and scheduled tribe cultivators in total number of holdings and their share of operated area.

The small and marginal farmers together are more than 55 per cent of the total number of holdings, but their area share is very low. Similar is the case of farmers belonging to scheduled castes and scheduled tribes. However, it is interesting to note that most of the holdings of the target group fall in the category of uneconomic holdings and hence well irrigation with large share of investment from own sources is not a feasible alternative. Moreover, we find large variations in these proportions of small and marginal farmers across blocks. Table 2.2 gives the proportion of number of blocks falling in different ranges of proportion of small and marginal farmers. It may be noted that the proportion of small and marginal farmers across blocks varies from 10 to 68 per cent. Variance is larger in the group of marginal farmers as compared to small farmers.

Table 2.2 : Distribution of Blocks According to Proportion of Small and Marginal Farmers

Ranges of Proportions	Number of Blocks falling in different ranges for the group of	
	Small Farmers	Marginal Farmers
Upto 25 per cent	19 (55.9)	16 (47.0)
25 to 50 per cent	15 (44.1)	12 (35.3)
Above 50 per cent	Nil (-)	6 (17.7)
Total	34(100.0)	34(100.0)

Note : Figures in brackets are proportion to total.



Given this degree of variation, a blanket programme of equal allocation for each block (of Rs. Five lakh) would certainly mean depriving, at least 50 per cent of the target group, of adequate investible resources.

Maharashtra being one of the deccan plateau States having very low level of irrigation naturally the cropping intensity is also very low. The proportion of irrigated area is not more than 10 per cent in most of the blocks selected. Hence, the development of the cropping pattern has also gone in favour of dry land crops. The cropping pattern is predominantly a cereal centered one. Jowar area is as high as 40 per cent followed by bajra (14 per cent) and paddy (8.5 per cent). Areawise, cotton is the major cash crop with about 3 per cent area share. Sugarcane, is a crop concentrated only in a few pockets of the State and has about 2 per cent area share. Among the remaining crops, pulses account for 15 per cent of gross cropped area and oilseeds have about 10 per cent, which really means that the crop economy is dominated by low value low density crops. This coupled with the lower size of holdings brings out the financial vulnerability of an average small or marginal farmer of the State.

## II.2 Comprehensive Watershed Development Programme (CONDAP)

With the operational constraints well recognized, it was necessary for the State Government to tailor the 'minor irrigation' component of the Centrally Assisted Scheme for

Small and Marginal Farmers to suit the requirements of the target group. The COWDEP programme is in operation in the State since 1983 and is mainly covering soil and water conservation measures in the State. The programme includes (i) Contour and Graded bunding (ii) Terracing (iii) On farm Dry Land Development Works - Afforestation and Grass Plantation (iv) Nalla bunding (v) Land Development and horticultural plantations (vi) Land shaping and grading (vii) Broad bed and furrows and (viii) Reclamation of ill drained soils. The programme is operated entirely through the Soil Conservation net work of the Directorate of Agriculture and at the block level sub-divisional soil conservation officer is in charge of its implementation. The watersheds are identified in a district by a team consisting of Soil Conservation Officers, revenue officers, local peoples representative and other nominees. Most of the identified watersheds coincide with the village boundary with an average area of about 200 to 300 hectares. Most of the components of the COWDEP programme are taken simultaneously in the watersheds.

Major portion of the total allocation of the 'massive' programme is spent on COWDEP (Rs. 4.5 lakhs of the Rs. 5 lakh allocation for a block). The programme covers mainly soil and moisture conservation and hence has a long gestation period. Major portion of the benefits are in terms of averting the social cost of degradation of soil and increasing moisture availability. Due to the long gestation period of watershed technology and implicit secondary and tertiary benefits, it is difficult to

assess the incremental benefits in terms of income or yield of crops. However, the employment generation, area covered and expenditures on different components give some idea about the successful implementation of the programme.

Table 2.3 : Total Number of Watersheds by Size of Area Covered under Them

Area covered per watershed in hectares	Proportion of Blocks (%)	Total Number of Watersheds in the Size Group (Nos.)	Total Area Covered (in ha.)
Less than 100 ha.	29.2	455	3278 (2.0)
100 to 300 ha.	41.6	578	139292 (33.6)
Above 300 ha.	29.2	658	267560 (64.5)
Total	100.0	1691	415130(100.0)

Notes : 1. Based on the block level data collected from 24 blocks.  
2. Figures in brackets are proportion to total.

Table 2.3 shows the number of watersheds by size of their coverage. All watersheds together cover an area of 4.15 lakh hectares and majority of them fall in the size group of above 100 hectares. Hence, most of the watersheds are micro-watersheds and may take a period ranging from 5 to 10 years for completion of development works. Out of the selected blocks, more than 75 per cent of development work is completed in about 17 per cent of the watersheds. In about 29 per cent of watersheds 50 to 75 per cent of the work is already accomplished

and in the remaining watersheds the coverage is less than 50 per cent of the targets.

One of the important aspects of the present study is to assess the coverage of the target group under the programme. As indicated earlier, the COWDEP is an area development programme and hence it is obvious that the coverage would have limited target group members. Table 2.4 gives number of blocks by ranges of the per cent of the target groups and area covered.

Table 2.4 : Distribution of Selected Blocks by Proportion of Small and Marginal Farmers

Ranges of the Proportion of Small and Marginal Farmers	Proportion of Blocks	Proportion of area covered (%)	Average Farm Size (in ha.)
Below 25 per cent	13.6	8.0	3.48
25 to 50 per cent	13.6	14.8	7.71
50 to 75 per cent	22.8	24.9	3.23
Above 75 per cent	50.0	52.3	0.96
Total	100.0	100.0	1.82

It may be seen from the table that in more than 70 per cent of the blocks more than 50 per cent of the beneficiaries of COWDEP are small and marginal farmers. The average farm size varies between 0.96 hectares to 7.71 hectares. The variations across blocks is also a notable phenomena. The overall coverage of the programme indicate a fair share to small and marginal farmers. Similar is the case when we

look at the components of the programme. Table 2.5 gives activitywise coverage of the target groups and their area covered.

Table 2.5 : Activitywise Coverage of Marginal and Small Farmers in the Selected Blocks

CCWDEP Activity	Activitywise coverage of marginal and small farmers		Per cent of Total expenditure	Per cent of Total area covered
	MF	SF		
1. Contour and Graded bunding	3.9	1.6	8.7	35.3
2. Terracing	59.6	35.1	11.7	24.5
3. On Farm Dry Land Development : Afforestation and Grass Planting	1.3	0.6	2.6	10.6
4. Malla bunding	10.4	4.1	47.4	6.9
5. Land Development and Horticulture	1.0	0.9	1.3	0.6
6. Land Shaping and Grading	2.2	3.6	18.4	16.5
7. Broad Beds and Furrows	-	-	0.1	0.1
8. Reclamation of ill drained soils	0.2	0.1	0.3	0.7
9. Others	21.4	54.0	9.5	4.8

It may be noted that reclamation of ill drained soils, land development and horticulture and afforestation and grass planting, are the activities which relatively cover smaller proportion of target groups. This is not unexpected as these are mainly problems faced under larger holdings where we find higher proportion of uncultivated arable lands. Moreover, only 4.2 per cent of the total share of expenditure is claimed by these activities.

A target group specific programme (as indicated in the original design) would certainly show high coverage of the target groups and it will not be surprising even if the beneficiaries are all from the intended target groups. But, it is certainly creditable that the large number of beneficiaries of COWDEP are from the target groups though the programme is an area development programme. Most of the indirect benefits are non-measurable with the limited experience, but if measurable, these will again add to the directly accrued benefits to small and marginal farmers.

COWDEP was designed keeping in view four aspects. Firstly, it was intended to conserve and make available the soil moisture in the late kharif or early rabi season. Secondly, to arrest the soil degradation due to excessive run off. Thirdly, to induce the farmers to take up crops like pulses, oilseeds and horticultural crops on degraded lands. Lastly, to create additional rural employment for agricultural labourers and small and marginal farmers. It is obvious that

all the four objectives cannot be achieved in a minor irrigation programme, but this can be done with much lower cost under watershed development programme.

Table 2.6 : Distribution of Blocks by Average per Watershed Expenditure

Size Class of Expenditure per Watershed	No. of blocks	No. of Water-sheds	Average Expenditure per Hectare (in Rs.)
Below 50,000	8	547	1547
50,000 to 1,00,000	8	564	2462
Above 1,00,000	7	525	4191
All	23	1636	1874

Note : Based on averages of three years viz., 1985-86, 1986-87 and 1987-88.

Out of the 23 blocks, about 16 blocks have expenditure of less than 1 lakh per watershed. The total number of watersheds falling in these 23 blocks is 1636. It may be noted that the expenditure per watershed or per block is constrained by the allocation made to the block under the programme. However, it is interesting to observe the per hectare expenditure in different classes. With an average expenditure of Rs. 1875, one hectare of land can be treated under watershed, whereas

the minor irrigation programme would need about Rs. 20,000 for developing 1 hectare.<sup>4</sup>

The activitywise per hectare expenditure shows the diversity of funds required for different treatments. Nalla bunding costs on an average, Rs. 19,453 per bund, whereas the expenditure on dry land development through tree and grass planting costs about Rs. 6 to Rs. 7 hundred per hectare of the area treated. It was surprising to note that "other activities" (other than the specified eight components) cost Rs. 5570 per hectare, which is the second highest in the land development activities. The soil and water conservation benefits are of sustainable nature as compared to the groundwater benefits from hard rock areas. The total area covered is about 4.15 lakh hectares and this coverage has resulted in soil and moisture conservation to large areas in the selected talukas. In the absence of yield levels<sup>5</sup> on watershed basis, it is difficult to assess the impact on production. But, it is certain that this has eliminated large amount of crop losses due to drought.

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4 Though the short run benefits would be different from these two strategies. Minor irrigation would increase the cash flows substantially as compared to watershed development approach. But certainly benefits do not commensurate with the level of investment.

5 Karnataka watershed development programme has shown 240 per cent of increase in the yield of dry land crops. Discussions with Shri H. Chandrashekar, Statistician, Dry Land Development Board, Government of Karnataka.



### II.3 Employment Effect

Apart from being a successful soil and moisture conserving technology, the COWDEP strategy also enhances the rate of rural employment generation. Incidentally, the COWDEP strategy also receives large funds from Employment Guarantee Scheme (EGS) of Maharashtra Government. While analysing the expenditure and impact we have kept out the funds utilized from other programmes except 'Massive' programme. Similarly, here we give below the employment generated out of the funds made available under 'massive' programme. Table 2.7 gives the distribution of blocks and number of watersheds by size classes of employment created.

Table 2.7 : Distribution of Blocks and Watersheds by Size Classes of Employment Generated

Size Classes of Employment Generated	No. of blocks	Number of Watersheds	Average Employment Generated per watershed (in mandays)
Below 5000 mandays	7	496	1388
5000 to 10000 mandays	10	666	8244
Above 10000 mandays	6	474	17708
Total	23	1636	8626

It may be noted that there are about 16 blocks and 1140 watersheds which create employment of more than 5000 mandays per year per watershed. The average employment generated per lakh of money spent on watershed treatment is more than 12 thousand mandays. Similarly, the employment generated per

watershed ranges between 2000 mandays to 30000 mandays per year. These observations indicate large employment generation potential of the watershed development programme. It is obvious that major portion of the rural labour force is contributed by agricultural labourers and small and marginal farmers. Hence, a significant share of the generated income would flow to the target groups i.e., small and marginal farmers. Different activities in the COWDEP have varied potential of employment generation. The complex of activities in a watershed are decided by the soil-topological character of the region. However, an indication of activitywise employment potential can be got from the Table 2.8. Major share of employment generated is out of Nalla bunding, land shaping and grading, and terracing. Nalla bunding generates 2,675 mandays per hectare followed by land development with horticulture. This means that there is an increasing demand for semi-skilled workers.

When we look at the activitywise employment generation we come across two-fold observations. First, is the high employment intensity of the activities as noted earlier and consequent income flows to the target groups. Second, follows from the first observation. It shows that the employment generated under these programmes are momentary in nature and cause only spikes in the labour absorption curve. Once a watershed is completed this manpower would be released in the rural labour market. Moreover, dry land technologies at the prevailing level are not as labour absorbing as irrigated farming and

hence, a strain in the rural labour market would be unavoidable.

Table 2.8 : Activitywise Employment Generated Under COWDEP  
(Average of 1985-1988)

Sr. Activity No.	Employment Generated (per cent)	Per hectare Employment Generated (in mandays)
1. Contour and Graded bunding	5.2	47
2. Terracing	10.0	131
3. On farm Dry-Land Development Afforestation and Grass Planting	2.8	86
4. Malla bunding	57.6	2675
5. Land Development and Horticulture	3.0	1523
6. Land Shaping and Grading	18.9	366
7. Broad Bed and Furrows	Neg.	81
8. Reclamation of Ill drained Soils	0.7	364
9. Others	1.8	119

On the whole, it appears that the implementation of COWDEP programme in place of minor irrigation component is more desirable in agro-ecological situations prevailing in Maharashtra. The programme, however, faces a few constraints. Firstly, since it is an area development programme, suitable mechanisms should be inbuilt to monitor the flow of benefits to target groups. Secondly, with the present level of investment the

programme would have a very slow pace of growth and hence the level of investment can be stepped up. Thirdly, the programme should have flexibility at the implementation level. Such flexibility should be used to get optimum benefits to small and marginal farmers. Lastly, though the implementation necessitates pulling of the funds from different sources, the utilization of the funds should be governed by set of rules specifically prepared for COWDEP.

#### II.4 Distribution of Minikits

Minikit distribution programme has two basic objectives. Firstly, it is intended to easeen the access of small and marginal farmers to new inputs. Secondly, it helps them to adopt the technology and cropping pattern<sup>which</sup> can be directed (though marginally) towards the crops like pulses and oilseeds. Unlike COWDEP, the impact of minikit distribution programme is implemented according to the norms. However, it is not easy to assess the impact of minikit programme distributed under centrally sponsored scheme of assistance to small and marginal farmers to increase agricultural production because of various reasons. In Maharashtra State, like many other States, Minikits distribution programme is taken under various schemes. There are quite a few schemes operating in the State. It is not expected from the implementing authorities at lower level, to maintain a clear distinction between different programmes. Secondly, with the present scale of fragmentation of land

(both due to land reforms and demographic pressure), large number of cultivators fall in the target group. Thirdly, the size of the minikit programme is so small (both the type of kits and money allocated per kit) that it can hardly make a dent on the crop pattern, only it is expected to spur the movement. Lastly, the politico-economic structure of any average Indian village is such that the intended benefits do not reach the target group in full. With these bold limitations, we intend to analyse the impact of the 'minikit' programme on the economy of the selected blocks. We are concerned here with only two aspects namely - (i) the cropwise composition of minikits, the varieties and their regional suitability, and (ii) the changes in the cropping pattern in the selected blocks.

The coverage of the beneficiaries under the programme at block level indicates that 95 per cent of the beneficiaries are small and marginal farmers, indicating a spill over of only about 5 per cent. Of the 95 per cent beneficiaries, 59.9 per cent are small farmers and 35.2 per cent are marginal farmers, indicating a larger proportion of benefits going to the higher group within the two. Among the scheduled caste and scheduled tribe beneficiaries, the scheduled caste beneficiaries are 76.4 per cent. But this does not form any significant share of the total number of beneficiaries. The marginal spill over of the benefits to the non target group farmers is not unexpected or alarming but this occurs because of the similarities of other minikit programmes and the dominant

socio-political variables. As reflected from the data at block level it seems very clear that the benefits have gone to the intended target group.

Another important issue of the meso level impact is to match the cropping pattern of the blocks with the cropwise proportion of minikits distributed. This would indicate the intensity of the efforts to turn the cropping pattern in favour of the oilseeds and pulses (slow growth crops). Table 2.9 gives the cropping pattern of the crops and the proportion of minikits distributed in the selected blocks. About 44 per cent of the minikits distributed are of cereals like bajra, jowar and paddy. Of these three, jowar takes the major share. Only about 2 per cent kits are of the inferior cereals. These are specifically distributed in the blocks where these crops are concentrated. Oilseeds and pulses share the remaining 55 per cent of the kits. In the oilseeds category til (sesamum) and safflower take the major share. Groundnut minikits are given in bigger bags to be shared by a group of farmers. Bengal gram and red gram are the dominant in the pulses group. The other pulses like black gram (udid) and green gram (moong) also share about 7 per cent of the kits. The average cost of minikits distributed (excluding groundnut) works out to be in the range of Rs. 2 to Rs. 10 only.

It may be noted that though the cropping pattern is cereal dominant, the distribution of minikits is more in

Table 2.9 : Cropwise Distribution of Minikits

C r o p s	Proportion of area under the crop	Proportion of Minikits distributed
1. Bajra	14.2	15.02
2. Jowar	38.4	16.59
3. Paddy	8.6	1.22
4. Other cereals	1.7	1.16
TOTAL CEREALS	66.4	43.99
5. Red gram	5.0	7.14
6. Bengal gram	2.3	13.20
7. Black gram and Green gram	7.2	6.96
TOTAL PULSES	14.5	27.30
8. Sesamum		7.59
9. Safflower		7.67
10. Sunflower	6.7	4.70
11. Soyabean		2.07
12. Other Oilseeds		5.92
TOTAL OILSEEDS	8.6	27.95
13. Other crops	0.4	0.76
TOTAL	100.0	100.00

Note : Groundnut seeds are supplied in bigger bags to small groups of farmers.

favour of oilseeds and pulses. Among the cereals, jowar is the main crop sharing larger area, but bajra minikits claim larger share. In other words, the data indicates that the distribution of minikits has been in favour of the crops thus far lagging in the technological change.

As regards the varietal distribution of minikits it was noted that wide ranging cultivars are used across regions, specifically noting the regional requirements. This is essential considering the suitability of agro-climatic factors across regions. In many places fertilizer minikits were also distributed. Table 2.10 gives the type of the varieties distributed in the selected blocks.

It may be noted that wide range of varieties are available in case of bajra, jowar, paddy, bengal gram, black gram and green gram. The spread of varieties is not necessarily because of the higher demand for the varietal diversification but mainly to suit them to the local conditions. Another interesting point that emerges out of this table is the narrow spread of varieties in some of the oilseed crops. This cannot be totally attributed to the suitability of these varieties but also reflects the adaptability of the other cultivars. We shall discuss this aspect in the beneficiary level analysis.



Table 2.10 : Cropwise distribution of the types of varieties

Sr. No.	C r o p s	Types of Cultivars
1.	Bajra	RMR-1; MP-123; MH-143; MH-179; ICTP-8203
2.	Jowar	CSH-6; CSH-11; SPV-297; M-35-1; RSV-9-R.
3.	Paddy	K-23; K-24-10; Indrayani; Panvel; VDN-351-18.
4.	Bengal Gram	G-1; G-S; BDN-1; ICC-32; NJ-9.
5.	Red Gram	TT-6; GPL; ICPL-87.
6.	Groundnut	SB-11; JL-24.
7.	Sesamum	Punjab; JLT-7.
8.	Safflower	Bhima; Tara.
9.	Sunflower	Modern; Paradock; Paradise.
10.	Soyabean	MACS-13
11.	Mustard	Pusabold; Wamana.
12.	Moong (Green Gram)	S-8; 851; TAP-7; J-781; S-8.
13.	Udid (Black Gram)	T9; TAP-1; K-851; T-B-7; TAU-9.

## II.5 Impact on Cropping Pattern

The emphasis of minikit programme is on the adoption of technology and directing the cropping pattern in favour of slow growth crops. Given the size of the minikits distributed and the total investment on the programme, it is difficult to make any firm observations on the cropping pattern. However, it may be well understood that though minikits may not have

direct influence on cropping pattern, they may spur a chain reaction in the decision making process of the cultivators. In order to check the change in cropping pattern of the selected blocks we have taken two years with a gap of about 8 years. The first year represents the time before starting of the programme of minikits (1980) and the last year represent a recent year while the programme was in operation for about 5 to 7 years. Both the years are weatherwise normal years and do not show extreme crop output fluctuations.

Table 2.11 : Changes in Cropping Pattern in the Sample Blocks between 1980-81 and 1988-89

Sr. Crop No.	Proportion of Area under Crops		Change over the period
	Prior to the implementation of the scheme (1980-81)	After the implementation of the scheme (1988-89)	
1. Paddy	8.6	8.5	-0.1
2. Wheat	4.8	3.4	-1.4
3. Jowar	39.9	37.9	-2.0
4. Bajra	15.2	14.0	-1.2
5. Other Cereals	2.1	1.7	-0.4
6. Red Gram	2.9	5.0	+2.1
7. Bengal Gram	1.8	2.3	+0.5
8. Other Pulses	5.9	7.1	+1.2
9. Groundnut	2.6	1.9	-0.7
10. Other Oilseeds	4.8	7.9	+3.1
11. Other Crops	0.4	0.4	-

Note : Based on the averages of the selected blocks.

The table reveals marginal changes in the cropping pattern which can at best be taken as indicative of the trend. There is a slight decline in proportion of area allocated to cereals especially for jowar, bajra, and wheat. On the contrary pulses and other oilseeds (sesamum, safflower and sunflower) have gained in area **share**. This change is a welcome trend because of the slow growth pattern of these crops. This trend cannot be totally attributed to the minikit programme alone, but as indicated earlier, there are many thrust programmes which are in operation may cause such shift.

We have seen thus far that both COWDEP and MINIKIT components of 'massive' programme are implemented satisfactorily. As indicated by the block level average data, though there is no significant impact on cropping pattern, at least it indicates proportionate increase in area under slow growth crops. The COWDEP programme has a very good employment potential but this potential is likely to be released after completion of the developmental activities in the watersheds. This may create a glut in the rural labour market unless alternative employment programmes are available. The coverage of target group farmers in both the programmes is quite satisfactory. Even being an area specific programme COWDEP also shows a fair proportion of benefits to the target group. The spread of varieties in the minikits covers most of the agro-climatic situations whereas, the COWDEP components match any scientific watershed development approach.

## II.6 Operational Problems

The views about operational problems are collected from implementing authorities both at State and block levels. These are grouped according to the programmes.

### C O W D E P

I. Farmer's awareness of the programme is a real bottleneck which does not bring forth their active cooperation. This in turn delays the completion of watersheds. In this regard, educating the farmers regarding usefulness of watersheds would ensure larger participation. Extension agencies can be geared up for this task.

II. Work on different watersheds should start simultaneously in a block, which would mean higher allocation of funds.

III. Minor irrigation can be a component of the programme or taken separately in the scarcity regions taking into consideration the groundwater availability.

IV. The watershed development programme is tagged with the EGS programme and other such schemes. These programmes have different sets of operational constraints, which get imported into COWDEP. Hence, though the funds are drawn from different sources the COWDEP can have its own set of guidelines.

V. The funds allocated are quite inadequate taking into consideration the increase in wage rates and unit cost of activities such as dry land horticulture. Allotment should have the "targeted area of treatment" as the base and not the

block. The grants made available from massive programme are for the block as a whole.

### MINIKITS

I. The quantity of seeds and fertilizers are inadequate.

It should cover at least half hectare. Self explanatory pictorial literature may be supplied along with it.

II. Despite the wide spread of varieties supplied, it is difficult to take some of the crops in the absence of irrigation facilities. In fact, some of the supplied varieties need supportive irrigation for good yield. Hence, there is a need for drought resistant rainfed varieties for major crops.

III. The village level workers are loaded with multiple responsibilities and they are responsible for 5 to 6 villages. Hence, it is difficult for them to carry out their functions satisfactorily. This is one of the major snags in the distribution of minikits.

IV. Minikits of crops should be provided at least a month before the sowing season. This would solve two problems, viz., the distribution of minikits will not be affected due to rainy \* season and that the farmers would prepare the lands for the intended crops.

V. The multiple agency approach should not be followed in distribution of minikits. Presently, both the BDO and T and V

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\* Many of the villages are not accessible during rainy season.

officers are involved in the distribution. This results in inconsistencies in the lists of beneficiaries from the two agencies and double benefits for some of the influential cultivators.

VI. Many of the implementing officers indicated that the transport charges provided for transporting and distribution are inadequate and there should be an upward revision.

## CHAPTER III

### MICRO LEVEL IMPACT OF THE SCHEME

The micro-level impact of any scheme is a complex function of design, implementation and beneficiary response. Though it is difficult to quantify the benefits and ascribe the shares to their components, it is possible to locate the soft patches in the impact analysis. The success of any programme is certainly reflected in the impact at grass root level. It is not enough only to have an idea about the coverage of beneficiaries but also to look into the extent of economic impact. Any impact analysis is always complicated by the multiplicity of the layers of impact and difficulties at the quantification of higher level impact. Hence, any impact analysis has to satisfy at direct level quantifiable impacts and suggest the probable secondary and tertiary changes. The distortions in the implementation of any scheme would indicate far reaching detrimental consequences. Hence, we are concentrating in this chapter on the direct impact of the centrally sponsored scheme of Assistance to Small and Marginal Farmers for Increasing Agricultural Production. Some of the secondary effects of the scheme on the household economy are also analysed but we could not probe into the higher level changes.

The micro-level impact of the scheme has beneficiary response as one of the major determinants. We had selected two blocks (Aurangabad and Mokhada) falling in two different regions of the state for impact assessment analysis.

Incidentally we got a watershed (Aurangabad) where the awareness of the beneficiaries about different developmental works is at a higher level as compared to the other block. This gave us an opportunity to check the hypothesis relating beneficiary awareness and differential impact of the schemes. These two blocks were selected from the list of blocks analysed in the Meso-level analysis. These blocks represent two distinct agro-climatic situations in the state. Mokhada taluka of Thane district comes on the eastern slopes of Western Sahyadri ranges. It is a predominantly tribal block with higher size of holding. The basic infrastructural facilities have not been well developed in the region. Almost 90 percent of its population belongs to scheduled castes and scheduled tribes. Aurangabad block falls on the Deccan plains with totally different characteristics, (See Table 3.1). The density of target group (small farmers, marginal farmers, SC and ST cultivators) is quite high in Mokhada block as compared to Aurangabad. The average size of holding in Aurangabad is lower than that in Mokhada. Consequently the small and marginal farmers form a large group (49 percent) in Aurangabad as against (32 percent) of Mokhada.

The juxtaposition of these two blocks gives us interesting comparisons on four aspects. Firstly, high population density block as against a low density block, would mean that the resources would be shared unevenly in the two blocks. Secondly, the two blocks also show differential composition of



target groups. Thirdly, the proportion of agricultural workers or the dependence on agriculture alone varies substantially in the two blocks. This would trigger differential impact at secondary and tertiary levels. Fourthly, both the blocks are at different levels of beneficiary participation rates. In Aurangabad work of a voluntary organisation has created intensive awareness about the programmes. On the other hand, Mokhada represents very low level of awareness and consequently the participation rate.

Table 3.1 : Basic Characteristics of the Selected Blocks

Sr. No.	Characteristic	Mokhada	Aurangabad
1.	Total Rural Population (in thousands)	64.2	199.6
2.	Density of Population (persons per sq.km.)	96.0	124.0
3.	Proportion of Scheduled Castes and Scheduled Tribes (%)	89.6	11.2
4.	Proportion of Agricultural Workers (Cultivators + Agri. Labourers) (%)	53.6	37.0
5.	Proportion of Small and Marginal holdings in total holdings (%)	32.3	48.9
6.	Proportion of Scheduled Caste and Scheduled Tribe holdings (%)	94.5	4.3
7.	Density of the target group (persons per 100 hectares)	53.0	24.0

### III.1 Sample Design and Methodology

For the purpose of impact assessment the watershed were

selected with three basic criteria viz., (i) the watershed having larger area under both the activities of the programme, (ii) the watershed should have coverage under maximum number of components of COWDEP (iii) more than 75 per cent of the work under COWDEP is completed. We have concentrated specifically on the COWDEP because this component of the scheme involves a certain gestation period. Any impact of such programme before such minimum gestation period would be immature. On the contrary, the Minikit programme does not involve such lag and hence we have taken the same region to assess the impact of Minikits. This has provided an opportunity to assess the combined impact of the programme.

After selecting the two blocks with the criteria discussed above, we obtained the list of the watersheds and villages from the Sub-Divisional soil conservation officer and Block Development Officer. The watershed with larger area coverage and with most of the watershed components was selected for the primary data analysis. A list of villages falling within the watershed and surrounding the watershed was drawn for selecting the beneficiaries. The beneficiary lists pertaining to the selected watershed and the villages were obtained from Sub-Divisional soil conservation office for COWDEP and Block Development Office for Minikit distribution. The list of beneficiaries relating to minikits was augmented with the help of the lists obtained from the T and V office. The beneficiaries were arranged in ascending order of their

size of holding. The sample of 25 beneficiaries of COWDEP and another 25 beneficiaries of minikits were drawn from each block by following systematic random sampling.

Impact assessment can be accomplished by two types of comparisons. Firstly, we can collate the pre-programme situation with that obtained after the successful implementation of the programme. Secondly, we can also compare the programme area situation with the non-programme area. In the case of the implementation of "Massive" programme, it was difficult to locate a "non project" area with similar characteristics because the COWDEP works have started in large areas and are presently at different levels of completion. We have also tried to get the data from the same beneficiary for the area falling within watershed and outside watershed but this comparison also did not yield any analytically superior results. Hence, we resorted to compare the "before programme" situation with that prevailing after the implementation of the programme.

The analysis is carried out separately because of the structure of the two programmes. The COWDEP programme aims at stabilisation and increase in production through higher yield levels, employment and cropping pattern whereas, the minikit programme generates awareness and adoption of new technology, changes the cropping pattern in favour of certain crops and improves production through yield rates. For the purpose of analysis, the information pertaining to the economic

activities of the household were obtained with the help of the structured schedule. Part one of the schedule covered general information regarding family particulars, cropping pattern, input-output particulars, etc. Part two contained specific questions about the impact assessment. The information obtained pertain to the agricultural year 1988-89. While analysing the impact of the programmes we have dealt the two blocks separately because of the entirely different situations prevailing in the blocks.

### III.2 The Case of Concentrated Target Groups

Mokhada is a typical hilly region with high concentration of scheduled caste and scheduled tribe population. Being a predominant tribal area, the level of literacy and consequently the awareness of the government programmes is not very high. Each village constituted a micro-watershed in the block. We have selected two watershed villages namely Ase and Poshera for our analysis. For the analysis of minikit programme we have selected other three villages in the same region. Of the 50 selected farmers, 48 happened to be the scheduled tribe households. The total beneficiary households were 510 under COWDEP in the two villages and 91 under minikits. Out of these 510, about 70 percent have the holding size below 2 hectares and 56 percent have area less than one hectare. According to the directives issued by Directorate of Agriculture, Government of Maharashtra, the minikits under massive

programme have to be distributed only to the small and marginal farmers. But, while actually distributing the minikits the farmer does not have to declare the size of holding. Hence the list of beneficiaries of minikits did not have the size of holding indicated against their names. The flaw in the process of distribution coupled with the socio-political situations of the villages\* have resulted in the distribution of minikits to the non-target groups. We are analysing below the two programmes namely COWDEP and Minikits separately.

### III.2(A) Comprehensive Watershed Development Programme

The most important aspects of COWDEP programme are soil and water conservation. The watershed development activities are expected to bring in a change in the land utilisation pattern both at village and farm household level. The expected changes are in the proportion of uncultivated lands, the cropping intensity, crop combinations and intensity of irrigation. With almost negligible irrigation facilities the changes in the irrigation intensity are not observed. Table 3.2 presents the changes in land utilisation of the farm households as observed after implementation of the programme.

It may be observed that there is a slight increase in the size of holding but it can not be ascribed to the implementation of the programme. The proportion of uncultivated lands

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\* This is a reality which can not be avoided given the present socio-political set up and the authority vested with the village level workers. Hence it cannot be treated either as shortcoming of the design or failure of proper implementation.

Table 3.2 : Land Utilisation Pattern of the Sample Households before and after Implementation of COWDEP

Size Group of Holding (in hectares)	Average Area Owned (in hectares)		Percent of Cultivable Wastes and Other Fallows		Proportion of Net Cultivated Area (%)		Cropping Intensity (%)	
	BP	AP	BP	AP	BP	AP	BP	AP
Upto 2 ha.	1.40	1.40	26.4	26.4	73.6	73.6	100	100
2 to 4 ha.	3.03	3.03	29.1	41.3	70.9	58.7	103	100
Above 4 ha.	7.06	7.24	47.7	53.3	53.3	47.7	100	100
All Farms	4.28	4.35	33.0	47.0	67.0	52.6	101	100

Note : 1. BP - Before the implementation of the project.

AP - After the implementation of the project.

2. None of the households reported any area under irrigation

has increased after the implementation of the programme especially in the higher size classes of holding. Watershed technology being a location specific technology may cause a reduction in the cultivated lands especially in the regions where portions of cultivated lands are already degraded. These lands will be eased out of cultivation and put under different uses such as horticulture, forestry, and pasture development. The increase in the uncultivated lands may be due to this factor. Moreover, these lands have a symbiotic relationship with the cultivated lands, and hence it is possible that the changes might have been introduced by new cropping sequences.

The changes in the cropping pattern indicate a tilt towards high value cereals. But these changes, as expected, are not uniform across size classes. We have presented in Table 3.3 the changes observed in the cropping pattern after the implementation of the COWDEP. The cropping pattern of the block is dominated by ragi, wari (both inferior cereals), paddy and pulses. The inferior cereals are the staple food crop of the majority tribal population. In the absence of irrigation facilities and marketing infrastructure the subsistence crop pattern is not so conspicuous. It may be observed from the table that proportion of area under paddy has increased in all the size classes with the lower size class having 2.45 percent increase. It is not the magnitude of the change that is important here but the fact that the change has occurred in the region in the absence of any area under irrigation. This would mean an increased moisture availability or better water harvesting techniques. Apart from paddy, farmers have started growing more wari, which is an inferior cereal mostly consumed in the higher social strata unlike ragi. The proportion of area under paddy and wari has increased by about 3 percent (for each) and the area shares under ragi, oilseeds, and pulses have gone down. Apart from these, the other crops have not shown any systematic changes.

The shifts in cropping pattern vary across size-classes. Though the group of medium and large farmers behave in almost

Table 3.3 : Changes in Cropping Pattern Due to the Scheme

Crops	Increase (+)/Decrease (-) in proportion of area			
	Upto 2 ha.	2 to 4 ha.	Above 4 ha.	All farms
Paddy	+ 2.45 (6.90)	+ 0.29 (19.40)	+ 2.11 (21.57)	+ 3.44 (18.52)
Ragi	+ 3.34 (27.60)	- 4.65 (31.03)	- 2.57 (35.73)	- 4.31 (33.70)
Wari	+ 0.61 (13.79)	+ 8.55 (19.40)	+ 1.12 (21.07)	+ 3.99 (20.00)
Red gram	- 3.01 (13.79)	- 1.53 ( 8.62)	- 0.51 ( 5.87)	- 1.33 ( 7.41)
Bengal gram	+ 2.61 (10.34)	- 1.18 (9.05)	- 0.26 (6.13)	- 0.69 (7.78)
Horse gram	- 6.60 (13.79)	-0.73 ( 3.88)	+ 0.87 ( 3.47)	- 0.08 ( 4.81)
Niger seed	+ 0.58 (13.79)	- 0.75 ( 8.62)	- 0.76 ( 5.86)	- 1.02 ( 7.78)

Notes : Figures in brackets are proportion of area under the crop before the beginning of the programme.

similar manner, the small and marginal farmers depict a different pattern. The preference of ragi is more pronounced in the small and marginal farmers group, whereas wari is preferred by medium and large farmers. A substantial decline in the share of area can be observed in red gram and horse gram in the group of small and marginal farmers, this decline could not be compensated by increased area share of bengal gram. Horse gram is a crop generally grown on marginal lands and



hence these lands are not necessarily suitable for other crops. Moreover, it is a low value, low yield crop and hence receives last preference in the farmers decision calculus.

The most important factor reflecting impact of watershed and also the scheme is the changes in the production of crops. The crop production changes both due to area increase and incremental yield rates. We have already noted the cropping pattern changes. These changes cannot be totally attributed to COWDEP but a large portion of the changes are due to the COWDEP. Similarly, yield improvement is, not a direct consequence of COWDEP alone. Similarly, yield improvement is, not a direct consequence of COWDEP alone. It has a complex of variables dictating its pattern. We have presented in Table 3.4 percentage changes in yield rates across size classes. It is, interesting to observe that out of the 21 cases as many as 15 have shown improvement in yield rates. Paddy and ragi are the crops which have shown consistent improvements, across the size classes. Wari and bengal gram have also shown **positive** yield increment for all farms together. But, for the other crops the results show mixed experience across size classes. Development of a watershed would increase the in situ moisture availability in the stress period. The improvement in yield rate is as high as 34 percent in ragi as against 18 per cent in paddy and 17 per cent in wari. As between the farm households, the small and marginal farmers have shown positive incremental yield for all crops unlike the other two size

Table 3.4 : Percentage Change in Yield Rates Across Size Classes

Crop	Percentage Change in Yield Rates (%)			
	Upto 2 ha.	2 to 4 ha.	Above 4 ha.	All farms
Paddy	14 (1750)	14 (1495)	21 (1034)	18 (1227)
Ragi	6 (833)	38 (537)	35 (479)	34 (521)
Wari	16 (617)	-40 (713)	13 (437)	17 (561)
Red gram	40 (263)	-25 (567)	262 (69)	-7 (369)
Bengal Gram	14 (250)	-7 (365)	162 (78)	77 (264)
Horse Gram	400 (50)	-8 (558)	-17 (150)	-32 (212)
Niger seed	7 (150)	24 (242)	-28 (346)	-6 (275)

Note : Figures in brackets are yield rates of respective crops in kgs. per hectare before the implementation

classes of holding. This is commendable in the absence of any irrigation facility. Decline in yield rates were noted in the medium farmers group for most of the crops except paddy, ragi, and niger seed. The large farmers group has positive incremental yield in all the crops except horse gram and niger seed. As regards the size productivity relationship for the crops across size classes, we may note a clear inverse relationship in the case of paddy and ragi, an unstable inverse relationship for

wari, red gram and bengal gram and direct relationship for niger seed. With the changes in the yield levels the inverse relationship further becomes stronger. This means that the small and marginal farmers would derive additional leverage due to the implementation of watershed, though the changes could not be attributed to watershed alone. Many times the yield advantages of small and marginal farmers are nullified with the market access and the prices received. In order to look into the prices received by farmers we had recorded the actual market prices received by each group. (See Table 3.5).

Table 3.5 : Prices Received by Farmers : 1988-89

Crop	Prices in Rs. per quintal			
	Upto 2 ha.	2 to 4 ha.	Above 4 ha.	All farms
Paddy	358	282	274	280
Ragi	265	266	266	266
Wari	313	276	275	277
Red gram	700	625	590	625
Bengal gram	400	395	553	439
Horse gram	300	300	300	300
Niger seed	600	600	600	600

The table clearly shows no price disadvantages to the small and marginal farmers. Though this cannot be generalised, it certainly is a welcome phenomena in a tribal block, where market is dominated by the "haves". This is a peculiarity of

development of a tribal area market, because over the years the market access is made easy to the small and marginal farmers. In the absence of infrastructure, the farmers have to walk long distances to market places. Hence it is possible that this group obtains a price advantage compared to the other groups. This offers better income advantage to the group of small and marginal farmers, which is expected to be magnified when we take into account the net income.

Though the major objective of the programme is to increase agricultural production of the small and marginal

Table 3.6 : Gross and Net Income Across Size Classes  
(In Rs. per hectare)

Farm Size	Gross Income	Paid out cost	Imputed Cost*	Net Returns**	
				Farm Business	Net Income
Upto 2 ha	2306	999	2291	1307	-984
2 to 4 ha.	2246	1050	1623	1196	-424
Above 4 ha	1931	594	647	1337	690
All farms	2088	800	1130	1288	158

Notes : \* : Imputed at market prices

\*\* : Farm Business Income - is net of paid out cost

Net Income - Gross Income net of paidout and imputed cost.

farmers, the scheme actually aims at making this group economically viable. This would require better returns per unit

of land in terms of gross or net income. We have seen earlier that the group of small and marginal farmers have better yield advantage as compared to the other two groups. Further, that the prices received by this group of farmers are also better compared to the other two groups. Which means that the gross income per hectare of small and marginal farmers would be higher than that of the other groups. This is clearly borne out by the table 3.6. The gross income of the small and marginal farmers' group is 1.19 times higher than that of large farmers and 1.03 times more than the medium farmers group. This indicates that the target group is quite successful in maximising the gross returns per unit of land.

But when it comes to net returns (both farm business income and net income) the situation does not continue to be the same. Small and marginal farmers are clearly investing more in the inputs than their peers. The paid out cost per hectare in the group of small and marginal farmers is almost double of that in the group of large farmers. Surprisingly, the use of fertilisers is almost nil on the sample farms, may be both due to factor market accessibility and the prevailing rainfed conditions. In the paid out costs the major difference between small and large farms arises out of the wage bills and cost of the farm yard manure. This means, that the small and marginal farmers go for intensive cultivation as compared to their counterparts with higher holding sizes, which is not surprising and corroborates earlier studies. But this gets

reflected in the imputed cost and thereby in the net returns. The lower groups of holding have negative net returns per unit of land when we take into account the imputed cost. The farm size - net returns relationship is positive, which indicates that ultimately small and marginal farmers are not gaining much despite their higher yield rates, strengthening the hypothesis that large farmers try to maximise their profits, while small and marginal farmers try to maximise output.

As we have indicated elsewhere it would be erroneous to attribute the impact on farm economy to this scheme alone especially when quite a few programmes are taken up in the region which have direct and indirect effects on the economy. The decomposition of the impact would be a methodological challenge because of the complexities of the inter-mixed layers of impact. In order to circumvent this problem we have asked the farmers directly questions about their awareness of the COWDEP, the changes that they have noticed and the extension support received. The responses about the changes noticed are presented in Table 3.7.

Table 3.7 : Distribution of Farmers According to the Changes Noticed by them

Farm Size	Percentage of Farmers Reporting improvements in			
	Irrigation or Moisture Availability	Yield Rates	Wages & Employment	Fodder Availability
Upto 2 ha.	-	70	100	33
2 to 4 ha	8	77	77	23
Above 4 ha	-	78	100	33
All Farms	4	76	88	28

It was noted that wages, employment and yield levels are the basic components which have changed after the successful implementation of COWDEP. The availability of fodder has increased but the treatment of waste lands has not received its due priority. In other words, the fodder availability has further scope of improvement. Irrigation and moisture availability did not show overt changes and hence not noticed by farmers. However, these are reflected in the levels of yield rates. The farmers have shown adequate level of understanding of the COWDEP works, though they were not posted with the reasons behind each of the components. Moreover, they were also not very enthusiastic about acquiring further information. Only twelve percent of the sample households have kept in touch with the extension agencies. The implementing officers have aired the lack of enthusiasm and community awareness of the programme.

#### III.2(B) Impact of Minikit Programme

Unlike 'COWDEP' the impact of minikit is direct and immediate. As mentioned earlier, the impact of minikit distribution on the beneficiaries is two-fold. One is that the distribution of minikits is expected to bring in the intended changes in the cropping pattern in favour of oilseeds and pulses or some other crops. The second one is the dissemination of new technology through distribution of high yielding seeds, fertilizers, pesticides, etc. In order to analyse the impact of minikit distribution at the beneficiary level, the

data on various household activities are collected from the selected block. However, it may be mentioned at the outset, that segregation of benefits accruing to farmers due to the 'Massive programme' has been difficult due to simultaneous operation of various minikit distribution schemes in the State. Hence, it may be noted that the analysis provides broader aspects of the impact of minikit distribution programme rather than pinpointing the impact of any specific scheme, though we have tried our best to differentiate the 'massive programme' from others.

While analysing the impact of minikit programme it is pertinent to look into various objectives of the programme. The main objectives of the programme, apart from the general objective of the target group coverage, are (1) the impact of seed distribution on cropping pattern, (2) the impact on production (3) Varital distribution and their impact on inter cropping, etc. Besides, it is also important to examine the impression of the farmers regarding the programme and the extension facilities available to them. In the following paragraphs, an attempt is made to examine all these aspects of the programme for Mokhada block. However, before going into the analysis part, we would like to mention that some of the large farmers have also entered the beneficiary lists due to the reasons, (explained earlier also) : (1) Farm size is not taken into account while preparing beneficiary lists, instead minikits are distributed on the basis of the area under the



minikit seed and (2) the socio-political and economic structure of the village is also propitious to large farmers.

As explained earlier, Mokhada is a hilly and tribal region without any irrigation facilities. The major crops grown in this region are paddy, ragi, wari, pulses and oilseeds. In order to examine the changes in the cropping pattern over the period, we have obtained data for two periods. They are triannum ending with 1983-84 representing the period before the implementation of the programme and the triannum ending with 1988-89 representing the period after the implementation of the programme. The changes in cropping pattern over the period are presented in Table 3.8. The data indicate that there is a clear and distinct change in the cropping pattern over the period. It can be observed that the changes are in favour of pulses and oilseeds against cereals and coarse grains.

Table 3.8 : Percentage Change in the Area Under Various Crops of the Sample Households between 1983-84 and 1988-89

Crop	Change in area in percentage points			
	Upto 2 ha.	2 to 4 ha.	Above 4 ha.	All Farms
1. Paddy	- 2.78	- 1.86	- 8.12	- 3.63
2. Ragi	-15.29	- 5.39	+ 0.11	- 5.71
3. Wari	- 7.48	- 1.78	- 0.30	- 2.24
4. Red gram	+ 7.11	+ 2.23	+ 0.69	+ 2.72
5. Bengal gram	+ 0.71	+ 1.63	+ 0.73	+ 0.62
6. Groundnut	+11.97	+ 7.98	+ 4.81	+ 7.86
7. Niger seed	+ 1.14	- 0.99	+ 2.07	+ 0.64

These changes are, however, in accordance with the broad objective of the programme i.e. improving the area under oilseeds and pulses, though the magnitude of changes differ across size classes. It appears that the changes are more prominent in the case of small and marginal farmers than their counterparts. On the whole, there is more than 10 per cent decline in the area under cereals as against 8.50 per cent improvement in the area under oilseeds and about 3 percent in the case of pulses. This indicates that the cropping pattern in this region is changing more in favour of oilseeds i.e. groundnut, than pulses.

Both the changes in cropping pattern and the yield improvements on the sample house holds cannot be attributed solely to the minikit distribution programme as there are number of factors like irrigation which influence the yield rates. The improvement in yield rates due to minikit can be

Table 3.9 : Percentage change in Yield Rates Across Size Classes

Crop	Percentage change in yield			
	Upto 2 ha.	2 to 4 ha.	Above 4 ha.	All Farms
1. Paddy	6.91	14.65	130.95	75.55
2. Ragi	27.25	28.86	67.43	56.62
3. Wari	-5.81	-35.06	72.08	15.15
4. Redgram	22.05	-38.27	486.95	0.54
5. Bengalgram	15.20	-26.03	506.41	56.44
6. Nigerseed	55.33	6.61	-0.58	9.62

attributed to the better quality of seeds, fertilizers and pesticides that are included in the minikits. The influence of all these inputs is stronger with irrigation. Hence, as this region is also covered with watershed development programme, the observed improvements in yield rates (See Table 3.9) may be attributed to the scheme as a whole. It may also be observed that the increase in yield rates are much higher in case of minikit beneficiaries than that of watershed beneficiaries indicating a stronger influence of the former programme on yield rates. However, unlike in the case of watershed beneficiaries, the yield improvements are higher on large farms in the case of minikit beneficiaries.

As regards the coverage of crops at the beneficiary level, only four crop varieties are being distributed among the sample farmers despite the wide coverage of crops indicated at the block level. They are groundnut, paddy, redgram and ragi in the same order of importance. The data on distribution of minikits by crop variety are presented in Table 3.10. The data indicates that most of the farmers received groundnut minikits followed by red gram, ragi and paddy. It can be observed that 16 per cent of the farmers are receiving more than one minikit with small and marginal farmers receiving more of them. This may be due to the division of families of small and marginal farmers on records in order to avail more benefits.

Table 3.10 : Percentage of Farmers Receiving the Minikits by Crop Variety

Crop	Percentage of Farmers Receiving				Crop Varieties
	Upto 2 ha.	2 to 4 ha	Above 4 ha.	All Farms	
1. Paddy	Nil	Nil	21	12	RIN 24 & Indrayani
2. Ragi	33	20	Nil	12	B11
3. Redgram	33	Nil	21	20	BON2 & TT6
4. Groundnut	67	100	64	72	JL 24

Note : The total of percentages in each column is more than 100 because some farmers have received more than one minikit.

As far as the size of the minikit is concerned, the average size is small and covers less than one acre in most of the cases. Along with seeds the per hectare availability of other inputs in the minikits are presented in Table 3.11.

Table 3.11 : Per hectare availability of Inputs Through Minikits Across Size Classes and Crops

Crop	Seeds(Kgs.)			Fertilizers (kgs)			Pesticides(grams)		
	Upto 2 ha	2 to 4 ha	Above 4 ha	Upto 2 ha	2 to 4 ha	Above 4 ha	Upto 2 ha	2 to 4 ha	Above 4 ha
1. Paddy	-	-	24 (0.63)	-	-	37	-	-	-
2. Ragi	5 (0.30)	5 (0.20)	-	8	-	-	-	-	-
3. Red gram	6 (0.25)	-	17 (0.20)	100	-	92	-	-	-
4. Groundnut	20 (0.38)	38 (0.29)	18 (0.28)	63	41	62	27	-	40

Note : Figures in brackets indicate the average size of the minikit in terms of area covered.

Of the four crop minikits, three are accompanied by fertilizers and only groundnut minikit contained pesticides. This indicates that the importance of pesticides is not realised, especially for crops like red gram and paddy. And, the number of varieties distributed within each crop is also limited due to the suitability of the soils and other factors in the region.

One more objective of the programme that is not being taken note of is regarding inter cropping. Increasing the area under inter cropping through distribution of suitable seeds is one of the objectives of this programme. However, in Mokhada region none of the sample households has received the minikit suitable for inter cropping. As far as the views of the farmers on minikit programme, all the sample farmers reported it to be good, though some of them have felt that the inputs were not sufficient and not distributed in time. In fact, more than 60 per cent of the sample farmers complained about the insufficiency of the inputs, while 24 per cent of them complained that they have not received the minikits in time. Hence, the problem of insufficiency of inputs seems to be widely felt. This may be due to the fact that the average size of the minikit is generally small (covering less than 1 acre) and also the predominance of groundnut where the seed requirement is high. On the other hand, more than 95 per cent of the sample cultivators felt that the yield rates have gone up due to minikit distribution and very few (12 per cent) of them faced some difficulty in obtaining the minikits. It is

observed that all the sample households have availed the help from VLW/VEW and they are convinced about the impact of improved technology in giving improved yields. Moreover, some of them (15 per cent) even felt that the improved techniques are suitable and effective under rainfed conditions.

### III.3 The Case of Participatory Process

Two blocks were selected randomly out of the list of 34 blocks, but incidentally we came across two distinct cases. The first one discussed earlier was a case of Mokhada a concentrated tribal block in the absence of farmer's active participation. It was noted that unless a participatory process is evolved the benefits of area based programmes are not fully realised. Though community participation is the most desired solution, it is difficult to achieve it. But, once this is accomplished through training, education and/or with the help of a voluntary organization, the results are exemplary. This is demonstrated in the case of Adgaon watershed in Aurangabad, where the participatory process began almost in the initial years of the implementation of the programme. The farmers participation was obtained by Shetkari Sahayak Mandal. Mr. J. M. Gandhi and Mr. Vijay Borade have taken considerable efforts since 1984 to bring around the farmers in a venture to develop the village on the lines of a watershed. Initially they faced certain problems but their experiment paid rich dividends thereafter. Today the community takes all the decisions

jointly and implement them.

We have covered four villages for the primary data collection on watershed and minikit beneficiaries. Most of the sample beneficiaries belong to the castes other than SC and ST. Out of 25 watershed beneficiaries only 3 belonged to Scheduled castes and one minikit beneficiary was from this caste group. Out of the total households having area under watershed, 32 percent belong to the group of small and marginal farmers and 12 percent to the group of scheduled castes. Among the minikit beneficiaries except one all belonged to the size group of below 2 hectares. But, as we had indicated earlier, it is not obligatory to declare the total size of holding while obtaining the minikits and usually the farmers only declare the size of the benefit plot, which is always below 2 hectares. Hence, the bunching of beneficiaries in the group of below 2 hectares a need not be understood as the concentration of target group.

### III.3 (A) : Comprehensive Watershed Development Programme

Significant changes are observed in the land utilisation pattern of Adgaon watershed. Though the holding sizes of the groups have remained almost the same, there are intra-group changes in the size of holding. These changes are, however, not reflected in the average size of holding of the groups. The proportion of : under irrigation has increased by about 25 per cent points (See Table 3.12). This was

possible because of the increased water table in the watershed area. The proportion of irrigated area was higher in the size class of farmers with more than 4 hectares of land holding. But, then even the small and marginal farmers have substantial area under irrigation and 23 per cent of it was added after the implementation of the COWDEP.

Due to the substantial change in the irrigated area, cropping intensity has increased in the region from 125 per cent to 129 per cent. But this increase is not smooth across size classes. Among the group of large farmers the cropping

Table 3.12 : Land Utilisation Pattern of the Sample Households - Before and After Implementation of COWDEP

Farm Size	Average Area Owned (in hectares)		Proportion of irrigated Area (%)		Proportion of Area Under Cultivable Wastes and Fallow (%)		Cropping Intensity (%)	
	BP	AP	BP	AP	BP	AP	BP	AP
Upto 2 ha.	1.57	1.57	21	49	4.78	5.96	112	131
2 to 4 ha.	3.09	3.09	17	38	12.06	8.64	133	136
Above 4 ha.	5.40	5.40	28	56	-	-	122	119
All Farms	3.07	3.07	21	46	6.62	5.21	125	129

Notes: 1. BP - Before the implementation of the project  
AP - After the implementation of the project.



intensity has reduced slightly indicating crop specialisation, whereas other two groups indicate higher level of double cropping. On the whole, the activities have led to area augmentation, both by irrigation and double cropping.

The underutilisation of land has declined in the sample group. But the experience of all the farmers is not the same. In the group of small and marginal farmers the underutilisation has increased as compared to the medium farmers' group. Surprisingly, the group of farm households with holdings above 4 hectares have hardly left any area uncultivated. The increased moisture availability brings larger area under cultivation as also increases the cropping (resource) intensity. Hence, there is an inherent resource constraint that dictates the behaviour of land utilisation (cropping intensity on one hand and bringing uncultivated land under cultivation on the other). The increased cropping intensity, proportion of irrigated area and proportion of marginal lands left uncultivated in the group of small and marginal farmers indicates increased resource intensity per unit of land, which means that the treatment of watersheds has considerably helped the small and marginal farmers.

The cropping intensity and irrigated area have changed the crop combinations across groups. Some of the new crops have entered the crop pattern and area share of the earlier crops have changed substantially. Table 3.13 presents the cropping pattern changes due to the scheme. It can be noted

that 21 out of the 36 cases considered have recorded increase in the area share and 15 crops/size groups have shown decline in area. Tur (red gram) sunflower, mosambi and other crops have consistently gained in their area share across size classes, whereas jowar (irrigated) and wheat have overall increased the proportion share of area. These are the crops which received higher share of area due to the additional moisture availability and increased proportion of irrigation. Bajra is the major crop of the sample region, it is a low value, low yield inferior cereal and hence its area share has reduced both under irrigated and rainfed conditions. Unirrigated jowar and bajra have lost substantial area share to irrigated pulses and oilseeds. In fact mosambi has been emerging as a new horticultural crop apart from crops like cotton and fodder crops. Among the size group of holdings, the small and marginal farmers seemed to have preferred a shift towards pulses, oilseeds, irrigated jowar and mosambi. They have reduced substantial area under unirrigated bajra, which means that the crops like pulses and oilseeds are getting higher share along with some horticultural crops.

The trends in the area shares indicate shift in the production structure which occurred both in irrigated and unirrigated crops. Moreover, the changes in yield rates also indicate the success or failure of the centrally sponsored scheme which intends to increase production on the farms of small and marginal farmers. We have presented the percentage

Table 3,13 : Changes in Cropping Pattern Due to the Scheme

Sl. No.	Crops	Increase (+)/Decrease(-) in Area Share (%)			
		Upto 2 ha	2 to 4 ha.	Above 4 ha.	All Farms
Bajra	I	- (-)	-0.2 ( 1.9)	-0.3 ( 2.8)	neg. ( 1.8)
	UI	-33.9 (58.0)	-14.0 (42.4)	-28.0 (50.3)	-22.2 (47.9)
Jowar	I	+4.7 (-)	+11.0 ( 5.2)	-1.8 ( 4.9)	+5.7 ( 4.2)
	UI	-1.9 ( 1.9)	-12.4 (14.2)	+4.6 ( 3.5)	-4.7 ( 8.4)
Wheat		-1.4 ( 7.5)	+4.7 ( 3.8)	+2.6 ( 4.2)	+2.8 ( 4.6)
Red gram	I	+ 3.1 (-)	+2.6 ( 0.5)	+11.8 (-)	+6.0 ( 0.2)
	UI	+4.5 (12.6)	-2.7 ( 7.1)	+2.5 (11.2)	-4.0 ( 9.5)
Sunflower	I	+12.5 (-)	+1.3 (-)	+3.3 ( 3.5)	+3.7 ( 1.2)
	UI	-0.6 ( 0.6)	+1.8 (-)	-0.7 ( 0.7)	+0.6 ( 0.3)
Mosambi		+6.0 ( 8.8)	+6.2 ( 1.4)	+3.4 ( 2.8)	+5.0 ( 3.2)
Vegetables		-1.3 ( 1.3)	- ( 7.6)	+1.3 ( 4.9)	- ( 5.5)
Other Crops		+3.6 ( 9.2)	+2.9 (15.9)	+12.6 (11.2)	+ 7.8 (13.2)

Notes : 1. I and UI indicate irrigated and unirrigated.

2. Figures in parantheses show the proportion of area under the crops before the scheme.

3. Other crops include green gram, cotton, gram and fodder crops.

changes in the yield levels as compared to the pre-scheme situation. The yield rates are presented only for principal crops due to the problem of arriving at uniform measure in the case of vegetables and fodder crops. In the case of Mosambi, the pre-project data were not uniform.

It can be observed that the yield rates have increased for all the principal crops except jowar, though the changes across crops are of different magnitudes. Of all the crops, sunflower has recorded highest improvement in yield followed by bajra. This improvement in yield can solely be attributed to irrigation. As noted earlier, the increased area under sunflower was mainly due to the availability of irrigation. Similar is the case of bajra.

The yield per hectare across size classes shows improvement for all the crops in the case of small and marginal farmers, a general decline in yield rates in the case of medium farmers and increase in yields of crops except jowar for large farmers. The medium farmers seem to have suffered a set back in yield for most of the crops. This is despite the fact that level of irrigation has increased in the size group. Similarly, intriguing is the case of jowar, where the yield rates have declined. A straight explanation of this phenomena seems to be difficult, but answers can be located in the decision making calculus of the farm households. The size productivity relation also seems to be distorted due to the fall in yield rates in the medium farmer's group.

Table 3.14 : Percentage change in Yield Rates across Size Classes

Crop	Percentage Change in Yield Rates (%)			
	Upto 2 ha.	2 to 4 ha.	Above 4 ha.	All Farms
Bajra	117 ( 558)	12 ( 432)	177 ( 474)	46 ( 473)
Jowar	75 (1333)	-1 ( 700)	-42 (1400)	-2 ( 822)
Wheat	10 (2500)	-16 (1813)	75 (1250)	1 (1850)
Red gram	9 ( 488)	-7 ( 906)	20 ( 813)	7 ( 771)
Sunflower	56 ( 500)	- ( 464**)	104 ( 457)	64 ( 469)

Notes : 1. Figures in brackets indicate yield rates in kgs. per hectare before the implementation of the scheme.

2. \*\* Sunflower was not taken as a crop before the implementation of the scheme.

We may now look into the prices received by the group of small and marginal farmers as compared to the other two groups. Table 3.15 presents the prices received by the small and marginal farmers. Small and marginal farmers receive favourable (better\* than the other two groups) prices for all the crops except bajra. In other words, their gross value of output per hectare is higher than the other two groups. Bajra is mostly consumed in the house and hence probably this group has a lower marketed surplus. Hence, it is more due to the lower size of the marketed surplus that they receive lower prices. Overall, the weaker sections get better yields and also receive better

\* This does not mean remunerative. It is only the inter-group comparison.

Table 3.15 : Prices Received by Farmers : 1988-89

Crop	Prices in Rs. per quintal			
	Upto 2 ha.	2 to 4 ha.	Above 4 ha.	All Farms
Bajra	159	173	183	174
Jowar	301	238	271	256
Wheat	300	245	279	267
Red gram	587	534	544	547
Sunflower	314	469	267	314

yields and also receive better prices for their produce.

The foregoing discussion brings out the favourable position of small and marginal farmers as far as the gross value of output per hectare is concerned. But as we have observed earlier that the resource intensity and distortions in the factor market (both accessibility and prices) result in lower net farm business income per unit of land for small and marginal farmers. The net farm business income and net income (net of imputed cost) are presented in table 3.16.

The small and marginal farmer's group has the highest gross income per hectare followed by the group of large farmers. The lowest gross income per hectare in the group of medium farmer's is mainly due to the lower resource intensity, lower yield rates and the relative price disadvantages. The paid out and imputed costs are highest in the group of small and

Table 3.16 : Gross and Net Income Across Size Classes

Farm Size	Gross Income	Paid out cost	Imputed Cost*	Net Returns**	
				Farm Business Income	Net Income
Upto 2 ha.	5580	2186	1323	3394	2071
2 to 4 ha.	1852	1099	965	753	-212
Above 4 ha.	4735	1021	1113	3714	2601
All farms	3411	1225	1068	2186	1118

Notes : 1. \* Cost imputed at market prices.

2. \*\* Farm Business income - is net of paid out cost.

Net Income - Gross Income net of paid out and imputed cost.

marginal farmers. This reduces their net farm business income substantially. Hence, as a result the net returns of the large farmer's group are highest as compared to the other two groups. Or, in other words, the price and yield disadvantages are more than compensated by the factor market price advantages and proper level of resource mix. The large farmers seem to be guided by profit maximisation whereas the small and marginal farmers optimise their gross returns.

Overall, the impact of watershed treatment is much better in Aurangabad region as compared to Makhada. The reasons behind this success is basically the process of participation, use of proper mix of inputs, a suitable cropping pattern and the

extension support. Almost all farmers endorsed that the development has taken place due to proper watershed treatment. Table 3.17 gives a gist of the opinion expressed by the farmers. It may be noted that almost all the farm households are aware of the watershed technology and its impact on the farm economy. It was noted that irrigation, moisture regimes, yield level, employment and wages have changed substantially during implementation of the programme. Activitywise, the awareness of the farmers indicates that contour and graded bunding is the most common component, followed by nallabunding. The farmers are also aware of terracing, afforestation, land shaping, broad beds and furrows but they have not acquainted themselves with the methods. Almost all of them keep in touch with the

Table 3.17 : Distribution of Farmers According to the Changes Noticed by Them.

Farm Size	Percentage of Farmers Reporting Improvement in			
	Irrigation & Moisture Availability	Yield rates	Wages & Employment	Fodder Availability
Upto 2 ha	88	88	100	100
2 to 4 ha	92	100	100	100
Above 4 ha.	100	100	100	100
All farms	92	96	100	100

extension agencies and familiarise themselves with the new schemes, inputs, seeds and methods of cultivation. They



discuss the problems among groups and reach a solution. It gives a classic example of a participatory process showing success after a proper implementation of the scheme. In other words, a successful implementation of any developmental scheme depends on the scheme design, the target group, administration of implementation and the participation of the farm household.

#### Impact of Mini-kit Programme

The analysis of the impact of minikit programme at the beneficiary level in Aurangabad block also has the problems regarding segregation of beneficiaries of various minikit programmes and the presence of large farmers in the beneficiary lists. However, Aurangabad, which has some irrigation and developed region is totally different from Mokhada in terms of socio-economic conditions. The major crops grown in this region are bajra, jowar, wheat, pulses, etc. In order to examine the changes in cropping pattern over the period we have collected data for two periods representing implementation of the programme. The changes in cropping pattern over the period are presented in Table 3.18.

The data indicate that there is a change in cropping pattern over the period though it is not as prominent as in the case of Mokhada. It can be noted that the changes are in favour of pulses as against cereals. Interestingly, the area under oilseed crops is marginal in both the periods. This

Table 3.18 : Percentage Change in Area Under Principal Crops of the Sample Households Between 1983-84 and 1988-89

Crop	Changes in Area in Percentage Points			
	Upto 2 ha.	2 to 4 ha.	Above 4 ha.	All Farms
1. Bajra	-28.90	- 2.63	- 6.05	-10.70
2. Jowar	+ 7.10	- 8.15	+ 1.53	+ 0.61
3. Wheat	- 7.59	- 2.79	- 5.39	- 5.31
4. Red gram	+13.36	+ 4.44	+ 0.63	+ 4.56
5. Black gram	+ 2.70	+ 1.06	+ 1.07	+ 1.42
6. Horse gram	+ 6.82	+ 2.94	+ 2.95	+ 3.89

may be due to the fact that this block is not an oilseed growing one and hence the minikit distribution is concentrated on pulses. However, the changes in cropping pattern are in accordance with the objective of shifting the cropping pattern in favour of oilseeds and pulses. The magnitude of change differ across size classes. It appears that the changes are more prominent in case of small and marginal farms. On the whole, there is more than 15 percent decline in the area under cereals while the area under pulses has increased by about 10 percent. And the remaining 5 per cent of the declined area is being covered by number of other crops like vegetables, sugarcane, cotton, etc.

As mentioned earlier, both the changes in cropping

Table 3.19 : Percentage Change in Yield Rates Across Size Classes

Crop	Percentage Change in Yield Rates			
	Upto 2 ha.	2 to 4 ha.	Above 4 ha.	All Farms
Bajra	68	29	12	25
Jowar	-34	54	-13	32
Wheat	-47	-19	-64	-6
Red gram	60	-45	-13	-15

pattern and the yield improvements in the sample households cannot be attributed solely to the minikit distribution programme as there are number of factors influencing the yield rates. This is more so in a developed region like Aurangabad where the growth in irrigation is substantial. However, it can be observed that the picture is some what different in Aurangabad as far as the yield improvements are concerned. Out of the four crops for which comparative data are available, only two recorded some improvement in yield (See Table 3.19). Moreover, red gram recorded 15 percent decline in the yield. This indicates that the minikit distribution programme does not seem to have much bearing on the yield rates.

However, the reasons for this marginal performance may be traced in the kind of minikits received by the beneficiaries. Interestingly, only one crop i.e. horse gram minikits were distributed in this region during the year 1988-89. This indicates that the coverage of crops is not given importance

while distributing the minikits despite wide coverage of crops reported at the block level. As far as the other inputs are concerned, none of the beneficiaries received fertilizers as a part of the minikit. And, the average size of the minikit is small and covering less than half a hectare in most of the cases.

Moreover, the objective of promoting inter-cropping is not taken note of while distributing the minikits. None of the sample farmers has received the inter-cropping seeds in the minikits. As regards the views of the farmers on minikit programme, most of the sample households (88 percent) reported <sup>to</sup> it/be good in general. However, 56 percent of them felt that the inputs (seeds) provided are insufficient and 12 per cent of the beneficiaries have complained that they did not receive the minikits in time. On the other hand, more than 80 percent of the cultivators have felt that the yields have gone up due to minikit distribution and about 24 per cent of them faced some difficulty in obtaining the minikits. The major problems regarding minikits in this region are (i) the supply of specific items like fertilizers are not available, and (ii) the quality of inputs is not good. It is observed that all the sample farmers have availed the help from VI/VEW. Though most of the beneficiaries are convinced about the impact of modern technology on farming, 16 per cent of them are not confident about the results.

Thus, to conclude, though the impact of minikit programme in Mokhada and Aurangabad differ to some extent, the results cannot solely be attributed to the minikit programme. Its performance seems to be somewhat better in Mokhada block. This may be attributed to the socio-political and economic characteristics of the region. In a tribal dominated and backward region like Mokhada, the minikit benefits, though marginal, may matter much and perhaps, they are sought after. Whereas in a developed region farmers may not give much importance to the miniscule benefits like minikits. This, in turn, may result in the negligence at the administrative level. Though this appears to be helpful in a way by giving more attention to backward regions, it may aggravate the intra-regional inequalities across the size classes.

## CHAPTER IV

### SUMMARY AND CONCLUSIONS

Agricultural development policy for the last four decades brought forth the problems of distribution of gains and long run sustainability of the growth.<sup>1</sup> The technology based solutions eluded the core group of agricultural economy viz., small and marginal farmers. This group of cultivators was relegated to the background during the technological leap of mid sixties mainly because of their constrained access to the factor market. A quick analysis of the problems concerning the less endowed cultivators would show that this group mainly faces two types of constraints. Firstly, their holdings are tiny, mostly un-irrigated and requiring investment in land development work. Secondly, it is the access to resources (HYV seeds, fertilizers, pesticides, irrigation, etc.) that delays their adoption of the new technology.<sup>2</sup>

Keeping these two broad constraints in view, Government of India launched a 'Centrally Sponsored Scheme of Assistance to Small and Marginal Farmers for Increasing Agricultural Production' during 1983-84. The scheme proposed an amount of

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1 The Indian Society of Agricultural Economics, Agricultural Development in India: The Next Stage, Himalaya Publishing 1987.

2 Dantwala M.L., In Introduction to P.C. Joshi's book on 'Institutional Aspects of Agricultural Development', Allied, New Delhi, 1987.

Rs. 5 lakhs per block of which Rs. 3.5 lakhs for minor irrigation, Rs. 1 lakh for minikits of seeds and fertilizers and Rs. 0.5 lakh for fuel and tree plantation. Subsequently, the scheme was revised and the allocations were also changed as Rs. 3.5 lakhs for minor irrigation, Rs. 1.00 lakh for land development and Rs. 0.5 lakhs for distribution of minikits.

Keeping in view the present minor irrigation development programme, level of groundwater availability and the problems of rainfed agriculture - the Government of Maharashtra modified the content of the scheme to suit the problems of the small and marginal farmers in the State. Hence the allocation of Rs. 3.5 lakh on minor irrigation was sought to be used for Comprehensive Watershed Development Programme (COWDEP) along with the Rs. 1.00 lakh allocation for land development. A careful review of the content of the programme, its objectives and the situations prevailing in the agricultural economy of the state it was noted that there was an ample justification for the State Government's stand in modifying the programme to suit its needs. Hence our analysis of impact is only of two components of the scheme viz., COWDEP and Minikits.

#### 4.1 Objectives

Given the present status of the scheme, we had set the following objectives to analyse the impact of the scheme :

1. To study the extent and coverage in terms of beneficiaries and area under the major components of the programme.

2. To analyse the changes in cropping pattern induced by the programme.
3. To analyse the impact on various components of the programme.
4. To document various constraints in operationalizing and administration of the programme.

#### 4.2 Methodology and Coverage

We have analyzed the impact of the scheme at three levels. Initially we have analyzed the implementation and administration of the scheme at State level. This was followed by a state level analysis. Our emphasis here was more on the design of the scheme and its implementation at State level. The second chapter deals with the meso level (block level) impact of the programme. We had selected 54 blocks and administered a structured schedule to the block level implementing authorities. For the selection of blocks we have followed two stage sampling. In the third chapter, the micro-level impact of the scheme is analysed at the beneficiary level. After selecting two blocks randomly falling in two different agro-climatic zones, a structured schedule was canvassed for the beneficiaries. Out of the selected blocks, a COWDEP watershed is selected with large area coverage and having most of the components. Similarly we have selected three villages from each block for the analysis of the impact of Minikits. Fifty beneficiaries of the scheme were selected from each. The agricultural year 1983-89 was a reference year for the analysis.



Impact assessment can be accomplished either by comparing pre-programme situation with that obtained after the implementation of the programme or comparing the programme (beneficiaries) situation with the non-programme (non-beneficiaries). In the case of present scheme in Maharashtra, it was difficult to locate a "non-project" area with similar characteristics because the COWDEP works have started in large areas and are presently at different levels. Similarly, obtaining in situ control information did not prove analytically superior. Hence, we resorted to compare "before scheme" situation with that prevailing after the implementation of the scheme. Care was taken to minimize biases due to memory lapses by compiling answers from different members of the household.

#### 4.3 Main Findings

Maharashtra Government chose to take up Comprehensive Watershed Development Programme (COWDEP) instead of "minor irrigation" as a component of the overall programme. Our analysis indicates that minor irrigation would have carried miniscule benefits to the target group. Moreover, since the ultimate groundwater potential in large parts of the hard rock areas is not very high, this would have introduced an element of financial risk. In such situation soil and water conservation becomes a priority programme. COWDEP is a suitable alternative to it. Our analysis of the basic design of the scheme indicated that the allocation of equal funds to the blocks irrespective of the concentration of target

groups would perpetuate the regional imbalances. A block with concentrated target group would get lesser funds per beneficiary (and hence uneconomic) as compared to a block with thinner population of target group. It would be beneficial in the spirit of the programme to give freedom to the State Governments to operationalize the programme. In such case, the State Government can prepare zonewise schemes for all the blocks of the State and sanction may be accorded by the Central Government.

The meso level impact of the scheme indicated that though largely the small and marginal farmers are benefited by the scheme, the COMDEP being an area development scheme has about 40 per cent beneficiaries belonging to non-target group. There are eleven components of the COMDEP programme namely I. Contour and graded bunding, II. Walla bunding, III. Terracing, IV. Land development-cum-horticultural development - Mango and Cashew, V. On farm development, afforestation and grass plantation, VI. Land shaping and grading, VII. Broad beds and furrows, VIII. Walla training, IX. Maintenance, X. Reclamation of ill drained soils and XI. Repairs of works due to heavy rains. Most of the watersheds taken for development are between 100 ha. to 300 ha. each. As regards the coverage of target groups, it was noted that 22.3 per cent of the blocks have more than 50 per cent of the target group and above half the sample blocks had the proportion of small and marginal farmers above 75 per cent.

Apart from being a successful soil and moisture conserving technology, the COMDEP has also enhanced the rural employment. Incidentally, the COMDEP also receives large funds from Employment Guarantee Scheme (EGS) and hence, the overall administration of the funds is guided by the regulations governing EGS. The employment generated per watershed ranges between 2,000 to 30,000 mandays depending upon the components of work. On an average, about 8 thousand mandays of employment is created by one watershed. Walla bunding, land development, and horticulture are the main sources of generation of employment.

Minikits programme serves entirely the group of small and marginal farmers. The state government has given directives to that effect to the block level officers. It is difficult to pin point the effect of the single minikit programme because quite a few programmes of similar nature are in vogue in the countryside. Farmers receive minikits from more than one programme, exchange these with others, sell the minikit, preserve it for the next season and hence it becomes difficult to analyse the exact impact of the programme. The coverage of the beneficiaries at block level indicates that 95.1 per cent of the beneficiaries are small and marginal farmers indicating a spill over of about 5 per cent. Of these 59.9 per cent are small farmers and 35.2 per cent are marginal farmers. The changes in the cropping pattern during the period of last eight years indicate three broad features. Firstly, there is an increase in proportion of area allocated to pulses and

oilseeds. Secondly, the crop pattern has diversified especially to include new oilseed crops. Thirdly, there is a substantial increase in double cropping and inter cropping practices. But all of this cannot be directly attributed to the programme of minikits under centrally assisted scheme. However, the share of the impact of the Central scheme cannot be neglected.

Wide range of varieties are distributed keeping in view the requirements of different agro-climatic zones. But cultivars distributed for the oilseed and pulses crops offer a limited choice to the cultivators. The small number of varieties in the oilseeds and pulses is mainly due to the adaptability of some of the new varieties under different agro-climatic conditions and the farmers' preferences.

The micro analysis was divided into two portions namely (i) the case of a target group concentrated block and (ii) the case of a participatory process. Incidentally, the two randomly selected blocks present these two diagonally opposite cases. The block with concentrated target group Mokhada has 89.6 per cent of its population belonging to scheduled castes and scheduled tribes. About 95 per cent of the holdings belong to scheduled castes and tribes. On the other hand, Aurangabad block (area with people's participation triggered by a voluntary agency) has about 49 per cent of the holdings belonging to small and marginal farmers.

The case of concentrated target group (Mokhada block) shows moderate impact of the COWDEP and Minikit programmes.

Of the list of beneficiaries of COMDEP about 70 per cent are small and marginal farmers. Which means that about 30 per cent of the benefits go to the non-target group. But this could not be avoided as COMDEP is an area based programme. Cropping intensity of the beneficiaries did not increase at all but the proportion of waste land showed an increase, indicating higher resource intensity on the cultivated land. The cropping pattern changes show a preference to paddy and wari (high water requiring crops), thereby indicating incremental moisture availability. The crop combinations also indicate the increased diversification. Yield per hectare has improved substantially in the case of paddy, ragi, wari and bengal gram. The improvement in production and yield was noted specifically in the group of small and marginal farmers. But the higher per unit cost incurred by the small and marginal farmers put them at the lowest of the ladder in the net income. Which means that the factor access truncate the advantages gathered with the productivity.

The impact of minikits on the target group indicates broad changes. The cropping pattern has gone in favour of pulses and oilseeds. The proportion of area under these crops have increased, but these crops do not have similar advantages in yield per hectare and hence, it is possible that the crop pattern changes induced by minikits would be short lived. The per hectare productivity on the lands of small and marginal farmers have improved substantially for ragi, red-gram and

niger seed. Inter-cropping has not improved in the group of beneficiaries because the kits supplied were not suitable for inter-cropping. The problem of insufficiency of inputs was felt by the farmers. This is an intriguing situation, where the farmers are provided with a new variety of seed barely sufficient for an area of 0.1 to 0.2 hectares, similar seeds are not easily available in the market and the varieties supplied need supporting inputs like irrigation and fertilizers. The financial and market constraints do not allow the small and marginal farmers an easy access to these. Consequently the use of new varieties is not reflected in the improvement in yield.

The case of participatory process gives quite different results. Most of the implementing officers have expressed that better results can be obtained with the active participation of the community. The participatory process began in Aurangabad almost in the initial years of the implementation of the programme. The results of the scheme (which also has received benefits of other developmental programmes) are extremely good. Due to the proper watershed management technology the moisture level and as a result, water table has increased. This has resulted in larger proportion of irrigated area and the cropping intensity has gone up. Crop diversification, increased irrigated area under the crops, double cropping and inter-cropping of new varieties of pulses are visible in the sample beneficiary group. Yield rates have gone up

for bajra, red gram and sunflower. Almost every sample beneficiary felt that there are substantial changes in irrigation availability, cropped area, yield rates, wages, employment and fodder availability.

However, the minikit programme has not shown similar improvement in the area under oilseeds. The area under pulses has increased but the yield rate has not shown any improvement. The cultivars provided are not always suitable for intercropping and require larger cash inputs along with irrigation. The insufficiency of the quantity of seeds provided in minikits is one of the most common problems faced by the beneficiaries. This has shown no improvement in the level of average yield of most of the crops. Farmers suggested to increase the cost of minikits and demanded an increase in the quantity of seeds at least sufficient for 0.5 hectares.

#### 4.4 Policy Implications

Basically the design of the programme should be changed taking into consideration the concentration of target groups across regions and states. The state government should be allowed to draw the programme for the target groups and allocate funds across regions. In the absence of such flexibility, the scheme is likely to perpetuate regional disparities across target groups.

To achieve balanced growth the allocation at the block level should be fixed taking into account the concentration of target group, resource availability, present agrarian structure and infrastructure.

It was noted that the participatory process brings out better results and hence special efforts be made to evolve such process. Conducive atmosphere for active participation on the part of cultivators would bring better results.

The quantity of minikits supplied can be increased taking into consideration the needs of the farmers (especially the target groups). It should be at least sufficient for half hectare. Our enquiries with the beneficiaries revealed that they are ready to pay higher amount towards the cost of minikits.

Extension net work needs to be strengthened to take up farmer's training camps for appropriate adoption of technology and inducing their active participation in the COMDEP scheme.

The non-target group beneficiaries in the area development programmes can be covered under other schemes so that the target group derive the fullest benefits of the scheme.

Finally, it is essential that the State government is given flexibility to operationalize the scheme. The design, implementation and concurrent monitoring of the scheme should be vested with the department of agriculture. Presently, only two of the above three functions are assigned to department. Many of the implementation level bottlenecks originate at the design level. An external evaluation and monitoring of the scheme would go a long way in modifying the scheme suitably from time to time.