ASSESSMENT OF WATERSHED DEVELOPMENT PROGRAMME IN GUJARAT

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CONTENTS

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ABBREVIATIONS USED

BPL	Below Poverty Line
DDO	District Development Officer
DDP	Desert Development Programme
DPAP	Drought Prone Area Programme
DRDA	District Rural Development Agency
DWAC	District Watershed Advisory Committee
EAS	Employment Assurance Scheme
HH	Household
IAY	Indira Awas Yojana
IWDP	Integrated Wastelands Development Programme
IRDP	Integrated Rural Development Programme
JGSY	Jawahar Gram Samrudhi Yojana
JRY	Jawahar Rozgar Yojana
NFE	Non-formal Education
NGO	Non-Governmental Organisation
PDI	Policy and Development Initiatives
PDS	Public Distribution System
PIA	Project Implementing Agency
SC	Scheduled Caste
SGSY	Swarnajayanti Gram Swarozgar Yojana
SHG	Self-help Group
ST	Scheduled Tribe
WA	Watershed Association
WC	Watershed Committee
WDF	Watershed Development Fund
WS	Watershed
ZP	Zilla Parishad

EXECUTIVE SUMMARY

Introduction

The present study broadly aims at an overall assessment of the watershed development programme in Gujarat state with specific emphasis on its impact on poverty alleviation. The study makes an attempt to assess the impact of the project on rehabilitating the natural resource base of the project area and increasing the availability of food, fodder/ fuel, income and employment to the inhabitants of the project area, especially the poorer and disadvantaged groups.

The study is based on primary information collected at the watershed and household levels. The sample frame consists of four completed watersheds to be selected from those watersheds that were taken up for implementation since 1995-96, after the Government of India accepted the new guideline for watershed development. These sample watersheds (all completed) are randomly selected from two districts representing both tribal/ hill and non-tribal/ plain regions. In order to be able to assess a diversified implementing situation, each of the sample watersheds is selected from a different Project Implementing Agency (PIA). From each of the selected watershed, about 10% of households representing various user groups are randomly selected and relevant information are collected from them through a structured schedule. Group discussions are also held with the members of WT, WDT, and PIA to assess the effectiveness of institutional mechanism to manage and sustain the project.

Sample Characteristics

The watershed areas are about 500 ha (the maximum permissible under the programme) for all sample watersheds, except for one case where the same is 650 ha. The watershed areas are almost equal to the net sown areas in all (but one) watersheds implying that only private agricultural lands have been developed in most cases benefiting only the land owning households. Only in one sample watershed in the tribal/ hill district, more than 100 ha of forest/ community lands have been developed in addition to private lands.

The rainfall data indicate that all sample watershed areas receive an average annual rainfall of about 800 mm, of which about 70 % is received during three rainy season months of June-August. However, since 1999, when most of these watersheds were completed, there has been more than 50% shortfall in the actual rainfall received across all watersheds, resulting in recurring droughts.

Small and marginal farmers mostly inhabit these watershed areas. The landlessness, however, is more prominent in the two watersheds in the plain/ non-tribal district as compared to the tribal/ hill district.

Programme Impact

Land leveling/ bunding and water resource development activities constitute the primary areas of intervention in all watershed areas followed by drainage line treatment and tree plantations. As mentioned earlier, about 90% of the development activities/ expenditure are confined to private crop land areas in three of the four sample watersheds; community land development is significantly taken up in only one of the watersheds in the hill district.

The land and water development activities have significantly improved the soil moisture conservation and thereby improving the crop yield in all watersheds. Although, there was hardly any increase in crop production during the last two crop years (1999-00 and 2000-01) because of successive droughts, there was general consensus that the crop damage was less severe compared to similar drought years prior to the watershed programme in 1996. In fact in the crop year of 1998-99, which was a good rainfall year, and when the land leveling works in many watershed areas were mostly completed, there was a significant increase in their crop production: while up to 25 % of yield increase was reported in three sample watersheds, doubling the yield level was mentioned in the fourth watershed in the hill district.

Tree and fodder plantations are carried out mostly in private lands especially in the plain district, and so there is not much overall impact on community lands. In none of the sample watersheds there is any livestock and grazing practices followed to protect and develop he common land resources.

The watershed development programme has a significant positive impact on creation of employment opportunities for the villagers, both landless as well as landowners. Of the total expenditure of Rs 4000 per ha spent in a watershed area, about 45-75 % are spent on labour across various watersheds resulting in employment generation of around 30-60 man-days per ha.

The sample households, consisting of both landless and landowners, were asked about what they felt were the main impacts of the watershed programme in their villages. Their overall perceptions indicate that employment benefit is the most favourable impact of the watershed programme, indicated by above 90 % of households in all watershed areas. Equally important is the perception regarding improvement in ground water condition overwhelmingly reported by 85-100% of households across all watersheds. The land-owning households have overwhelmingly mentioned that the project will also increase crop production.

Income Distribution

The tangible income/ benefit flows from the watershed areas may be classified into two categories viz. recurring and non-recurring. The recurring income flows consist of the

benefits from crop output, which will continue to be available even after the project period, while the non-recurring income flows from the wage bill are only one-time flows limited to the project period. We have found that while the non-recurring benefits are distributed among all groups of available villagers, the recurring benefits are confined to only some land-owning households in three of the four watersheds. The equity in income distribution depends on how the recurring benefits are distributed and whether the poorer sections have a stake in the projects. In this context, we find that in three out of four sample watersheds, large sections of households (35-60 %) consisting of landless and other groups have no share in the recurring benefit flows or any stake in the projects at all.

The lopsided income distribution pattern found in most watersheds, thus, clearly indicates a trend with no development alternatives for a large section of non-beneficiaries consisting of mostly landless and women groups. As a result, in spite of the positive impact of the watershed programmes on crop production and soil/moisture conservation, there is no significant reduction in the gender and income inequality in the project areas.

Implementation and Institutional Mechanisms

The Central guidelines make it mandatory for the state governments to create an elaborate instructional structure to plan, implement and monitor the watershed development activities at the district levels, where the available funds are disbursed. The overall success of the programme depends to a large extent on the vision and effective orientation of the Project Implementing agency (PIA), which is responsible for creation and capacity development of the project/ village level institutions like Watershed Association (WA), Watershed Development Committee (WC), etc. In this context we find that although our entire sample PIAs are NGOs having prior experience in watershed development, all of them are not guided by gender and equity considerations so as to attempt for an all round development in the watershed areas involving diverse users' groups including landless and women groups.

The approaches of three of the four sample PIAs have been to implement only a land development plan with no integrated planning for all user groups. So, although WA and WC are formed in these watersheds, these are not represented by all sections of villagers including landless/ non-beneficiaries. In this connection, the roles of WDTs in all watersheds are confined to only technical supervisions of watershed works and imparting limited training and extension services relating to improved crop and livestock practices. The WDT is not effective in the area of community organization. Thus, in all these watersheds, the services of the WDT and that of the PIAs have only benefited one of the user groups- the direct beneficiaries: the landless and other weaker sections have not been provided with any other income generating activities.

Watershed Development Fund (WDF) of Rs 0.7-1.0 lakh has been created (from the wage bill paid to the beneficiaries) in all watersheds to meet the future maintenance expenditure. There are, however, no management plans for the protection and development of community land resources.

In the absence of any non-farm development alternatives for the non-beneficiaries, consisting of landless and women groups in the watershed areas, not only the poverty

alleviation objective would remain unfulfilled, but even the maintenance of existing structures would be adversely affected, as the sections left out would have no stake in sustaining the watershed structures and other related assets.

Recommendations

Based on our above-mentioned field findings, we have identified the following issues that need attention of the policy makers as well as the project functionaries:

- The watershed committees formed in the tribal hill areas are in a better position to sustain the project activities, and can independently handle the development activities even when the services of PIAs are not available to them. So, it is advisable that the State / district administration, while selecting the project areas, gives first preference to tribal and hill pockets. The tribal areas are not only rainfed, but these are also inhabited by the poorest of the poor who need priority development attention. So, instead of selecting/ sanctioning watersheds in any area, the state government should be guided by a priority list of areas/ Blocks that need to be taken up under the watershed programme.

- In the recent years (since mid-1990s), after the new guidelines are accepted, and NGOs, Panchayats, etc. are allowed to implement the programme, there are umpteen proposals for watershed development from several new PIAs in all districts. In order that political pressures are avoided in the selection PIA, some minimum qualifications and relevant work experience for an eligible PIA should be introduced in the guidelines.

- As the target of a PIA is to develop a total area of 500 ha, with no minimum expenditure or area earmarked for development of community land areas, many of the PIAs opt for the easier (and least expensive) course of developing only the flatter terrain of cropland areas, where quick participation of land owning households is also possible. Such a development option leaves out a large proportion of landless and non-land beneficiaries from participating in the programme. In order to avoid such problem and minimize the conflict between beneficiaries and non-beneficiaries, a clause should be included in the guidelines indicting a minimum % area and expenditure (30-50 %) that need to be devoted for the development of community land resources and introduction of income generating activities for the landless and other weaker sections.

- The cost norm for watershed development is not based on land slope or type of land area that need to be developed. In general, a flat rate of Rs 4000 per ha is allowed, and so the PIAs attempt to select a rainfed village having a flatter terrain and having a minimum land area above 500 ha, where the land development works can be cost effectively implemented, even though the village may not be in the top priority list of watershed villages. There is thus a need to review the cost structure and norm, allowing higher per ha cost for the hill areas and community/ forestlands having higher land slopes.

- The effectiveness of community organization and sustaining the watershed activities depend to a large extent on the composition of the WA and participation of all users'

groups in development programme. As most PIAs have overlooked this aspect, the WDT should be asked to rework the development plan prepared by PIA, before commencement of the project activities, to include other (income generating) activities, which would directly benefit the left-out user groups or non-beneficiaries. In the absence of direct flow of benefits to all household groups, all of their participation/ membership in the WA is not possible. In order to achieve this objective, the WDT members, especially the social science experts, need to be further trained and oriented along with relevant PIA staff. The training topics should include:

- Identification of various user groups
- Assessing the need for each user group
- Finding suitable project activities mostly in the non-farm sector that would provide direct and recurring consumption benefit to all user groups, especially the landless poor and women groups.
- Roles and agreement of all user groups in the management and protection of community land areas.

- There is a need to diversify the role of WDT to get associated in the post project activities for a minimum period of 2-3 years after the project period to help various user groups in their production and marketing activities. The need for crop demonstration/ diversification is felt only after the project period when the effects of soil-moisture conservation are actually experienced. Similarly, the new activities (dairy, poultry, etc.) introduced during the project period are to be supported with market networking. The WA and WC need professional support in these respects for a few years after the project period, when the PIA withdraws from the area. The WDT could provide such post project professional services. If required, an additional member, a marketing expert, needs to be added to the existing four-member WDT to effectively handle this new responsibility. There is need for inter-departmental coordination to provide technical and marketing supports to the SHGs formed and activated in the project areas.

- We have found in this study that although there is positive impact of the watershed programmes on crop production and soil/moisture conservation, there is no significant reduction in the gender and income inequality in the project areas, as a large number of non-beneficiaries consisting of landless and women groups have not been provided with suitable development/income alternatives. Can we generalise this finding? We need to have an interstate study in this regard involving analysis of diverse watershed projects implemented by a cross section of PIAs including both government and non-government agencies. This study should specifically pin point the changes from primary activities to secondary activities in a post project scenario with specific reference to participation of landless-poor and women groups in such activities. This would enable the authorities to formulate suitable policies for development of the areas.

Chapter- 1
INTRODUCTION

1.1. BACKGROUND

One of the main causes of poverty has been identified as the under-productive natural resources, which are degrading fast. A vast majority of the rural poor depend on these (degrading) natural resources for their livelihood. These areas are charecterised by a large human and cattle population, which are continuously putting heavy pressure on the already fragile natural resource base for food, fodder, and fuel. A scientific natural resource management approach was needed to improve the vegetative cover and ground water potential of these areas, while at the same time involving the rural poor in planning, implementing and managing the resource base. Accordingly, following the recommendation of the Hanumantha Rao committee, a watershed approach was adopted from April 1995 to implement all area development programmes (DPAP, DDP and IWDP) and allowing utilisation 50 % of the EAS fund for the development of the watershed. This watershed approach aims at a participatory process to improve the natural resource base and the living standard of the people dependent on these resources.

The watershed management approach includes an elaborate institutional mechanism to ensure people's participation consisting of:

- Formation of Watershed Association (WA) comprising all adults residing within watershed project area.
- Formation of a Watershed Committee (WC), an executive body, consisting of 10-12 nominated members by the WA from among the user groups, self-help groups, gram panchayat, watershed development team, women, SC and ST.
- Selection of Project Implementing Agency (PIA) which could be either DRDA/ZP or other line department, voluntary organisation, autonomous organisation, etc. A multi-disciplinary team designated as Watershed Development Team (WDT) assists the PIA in providing technical assistance to the WC.

The watershed approach also attempts to make the project sustainable by establishing watershed development fund and involving people in deciding usufructs sharing mechanism on equitable basis.

Most of the watershed projects (about 6000) under the new guidelines have been taken up for implementation since 1995-96 under the DPAP. These projects are significantly implemented in 11 states viz. A.P, Bihar, Gujarat, Karnataka, M.P, Maharastra, Orissa, Rajasthan, Tamilnadu, U.P and W.B. There is a need to know how

the new guidelines for watershed projects have been implemented in these states. To what extent the problem of poverty has been effectively attacked in the watershed project areas? Are the poor (land less, marginal & small farmers) an integral part of the project? What is the agreed mode of sharing the usufructs and managing the natural resources? Are the WA and WC formed and effectively functional? Does the WC get the required technical help in time from WDT and the PIA? Is there any conflict among various user groups with regard to use and sharing of the resource base? Can the villagers themselves sustain the project work? What alternative/ additional arrangements are needed to make the implementation process more effective? The answers to these and related queries would indicate the effectiveness of watershed projects in rehabilitating the degraded natural resources while at the same time alleviating the rural poverty.

The present study, carried out at the instance of Planning Commission, attempts to examine the above stated issues for Gujarat state. Based on the findings of the present study, a framework could be finalised to assess similar watershed projects in other states. The study commenced towards end of March 2001and the field visits to the selected watershed areas were completed by the end of May 2001.

1.2 OBJECTIVES OF THE STUDY

The proposed study broadly aims at an overall assessment of the watershed development programme in Gujarat state with specific emphasis on its impact on poverty alleviation. The specific objectives of the study are:

- To assess the impact of the project on rehabilitating the natural resource base of the project area and increasing the availability of food, fodder, fuel, and income to the inhabitants of the project area, especially the poor.

- To find out how the direct and tangible benefits from the project are distributed among various user groups.

- To assess the institutional mechanism established in the watershed area and the effectiveness of the project functionaries.

- To examine whether the villagers can sustain the project on their own without much outside help in future.
- To suggest remedial measures (if any) for improving the programme effectiveness.

The detailed study components pertaining to the specific objectives stated above are as follows:

Project Impact

i) To examine how the project would influence rehabilitation of
   - Revenue land area
   - Community land area
   - Private (crop land) area

ii) To quantify the expected and actual flow of direct benefit from these areas.

iii) To assess the impact of the project in increasing the ground water potential and improving the vegetative cover in general.

Distribution of Benefit

i) To examine how various users groups have gained from the benefits flow from the project area.

ii) To asses the agreed and actual mode of sharing the usufructs.

iii) To find out whether the project has significantly improved the income, employment and living standard of the land less, marginal farmers and other disadvantaged groups in the project area.

Institutional Mechanism

i) To asses the functional status and effectiveness of

   - Watershed Association
   - Watershed Committee
   - Watershed Development Committee
   - Project Implementing Agency

ii) To find out whether the villagers have created a Watershed Development Fund for maintaining the watershed area.

iii) To examine the practice adopted by the villagers to maintain/ protect the catchment area.

Sustaining the Project

i) To assess the technical capacity of the villagers (WC) to maintain the watershed with out any help from the outside.

ii) To find out if there is any group conflict among villagers that might adversely affect people's participation and long-term sustainability of the project.

Remedial Measures/ Suggestions

i) To assess the perception of various user groups and find out their suggestions for improving the programme effectiveness.

ii) To suggest incase there is any need to:
- Develop the capacity of the project functionaries
- Upgrade the technological aspects
- Strengthen the institutional mechanism and people's participation in the project.

1.3. ADOPTED METHODOLOGY

As Agreed, the study report is based on primary information collected at the watershed level. The sample frame consisted of four watersheds to be selected from those watersheds that were taken up for implementation since 1995-96, after the Government of India accepted the new guideline for watershed development. The sample watersheds were to be randomly selected from two districts representing both tribal/ hill and non-tribal/ plain regions. Initially, we had selected Dahod district representing the tribal/ hill areas and Kheda district to represent the non-tribal/ plain areas. However, when we made the preliminary visits to these districts we found that in Kheda district, none of the four sanctioned watersheds was completed. We accordingly dropped Kheda district and included Panchmahal (Godhra) district, where many completed watersheds as per new guidelines were available.

In the second stage, after selection of the districts, two oldest and completed watersheds (since 1995-96) were to be selected from each district in such a manner so that one watershed area would consist of one village only and the other selected watershed would consist of more than one village. In Panchmahal district, however, we didn't find any of the completed watersheds having more than one village. So each of the two selected watersheds there represented one-village situation. In order to be able to assess a diversified implementing situation, each of the sample watersheds was selected from a different Project Implementing Agency (PIA). The district level information showed that there were 40 completed watersheds in Panchmahal district, which were implemented by 6 different PIAs of which two were selected. Similarly, in Dahod district, there were a total of 5 PIAs having 33 watersheds: two of these 5 PIAs were selected for the study. The names of these selected PIAs and watersheds are shown in table 1.1.

In the third and final stage, in each selected watershed, about 10% of households representing various user groups were randomly selected, as per the agreed sampling plan. Data from these sample households were collected through a structured schedule. Group discussions were also held with the members of WT, WDT, and PIA to assess the effectiveness of institutional mechanism to manage and sustain the project.

1.4. SAMPLE WATERSHEDS

The details of sample coverage are shown in table 1.1. As may be seen, four different watersheds corresponding to four different PIAs are selected from the two districts representing both plain (non-tribal) and hill (tribal) regions/ areas in Gujarat.

Table 1.1: Details of sample coverage

District Type/ Name	Name of selected PIA	Name selected Watershed/ village	Total number of Households	Number of sample households
Plain/ Non-tribal (Panchmahal)	Medhavi	Nani Kankdi	315	52
	ANaRDe Foundation	Demli	412	41
Tribal/ Hill (Dahod)	Sadguru	Goria- Dhadela	330	32
	Utthan	Ambli	325	36

In each of the selected watersheds, a minimum of 10 % of the total households representing various socio-economic and user groups are covered. A total of 161 households are thus covered in the study, which is about 12 % of the total families in the sample villages/ watersheds. The quantitative and qualitative information collected from these sample households and the PIAs are analysed and presented in this report.

1.5. ORGANISATION OF THE REPORT

The present report is divided into six chapters. The first chapter shows the objectives, methodology and sample coverage agreed and adopted for the present study. The characteristics of the sample watersheds and households are detailed out in chapter 2. The detailed impacts of the watersheds on rehabilitating the natural resource base and improving the overall living conditions of people are analysed in chapter 3, while the distributions of benefits among various household groups directly and indirectly dependent on the watershed areas are highlighted in chapter 4. The next (5^{th}) chapter describes the implementation and institutional mechanisms established in the project areas with specific reference to functional effectiveness of the PIAs in managing the project activities and the capabilities of WCs and WAs to sustain the projects after the project period. Based on all these findings, some recommendations have been made, in the last (6^{th}) chapter, to improve the programme implementation in future.

The maps of the watershed areas are annexed at the end of the report.

Chapter- 2
CHARACTERISTICS OF SAMPLE WATERSHEDS AND HOUSEHOLDS

In this chapter we have made an attempt to describe the physical and social characteristics of the sample watersheds, so as to understand the background and the factors that might affect specific impact. In the previous chapter, the names of sample watersheds and the corresponding PIAs are already mentioned: the entire four sample PIAs are NGOs. The sample watersheds are funded by the DRDAs from the centrally sponsored DPAP under the Watershed Development Programme. NGOs are mostly involved in Gujarat in the execution of this programme. Under this programme, a PIA is provided with a maximum fund of Rs 20 lakh to develop land area of 500 ha at the rate of Rs 4000 per ha on watershed basis involving all the inhabitants/ families. Only in exceptional circumstances, more area (above 500 Ha) and fund (above Rs 20 lakh) are allowed. In this section, we attempt to show the magnitude and types of land resources developed and got affected and the social characteristics for the sample watersheds. The actual and average rainfall received by the watershed areas have also been analysed to understand the immediate impact on the land water resources.

2.1. LAND RESOURCES

The details of land resources of the four sample watersheds are summed up in table 2.1. As is evident the four sample watersheds in the two districts

Table 2.1: Description of land resources

Information Type	Non-Tribal (Panchmahal) Dist		Tribal (Dahod) Dist	
	WS-I	WS-II	WS-III	WS-IV
1.Land Slope- %	5-10	2-5	10-15	10-30
2.Soil Type	Black cotton	Black& loamy	Loamy sand	Loamy sand
3.Soil Class of Agri Land	I and II	I and II	II and III	II and III
4.Total Geo Area- ha	547	987	844	963
5.Net Sown Area (%)	461 (84.3)	650 (65.8)	425 (50.3)	337 (35.0)
6.Forest Area (%)	0	19 (1.9)	255 (30.2)	526 (54.6)
7.Watershed Area (%)	500 (91.4)	650 (65.8)	489 (57.9)	495 (51.4)
8.NSA per household-ha	1.46	1.58	1.29	1.03
9.Forest Area per hh-ha	0	0.05	0.72	1.61
10.WS area per hh-ha	1.59	1.58	1.48	1.52

[Note: WS-I= Nani Kankdi watershed, WS-II= Demli watershed, WS-III= Goria- Dhadela watershed and WS-IV= Ambli watershed]

Present a contrasting scenario especially with regard to their terrain and forestland resources. In the non-tribal Panchmahal district, the land slopes of the two watersheds are up to 10%, whereas in the tribal hill district (Dahod), the land slopes of the two watersheds are quite steep with a high of up to 30% in Ambli and up to 15% in the Goria- Dhadela watershed.

The total geographical areas of the watersheds are between 800- 1000 ha except for WS-I in Panchmahal district, where it is slightly above 500 ha. As expected, forest areas are almost non-existent in the non-tribal (Panchmahal) district. In contrast, significantly higher forest areas are found in the two watersheds of the tribal district measuring up to 30% and 55% of the total geographical areas respectively. Net Sown Areas or the agricultural land areas as a % of total geographical areas are significantly much higher (above 65 %) in the non-tribal district as compared to the same (50 % and less) in the hill/ tribal district.

The land data presented in table 2.1 also indicate the magnitudes of Watershed areas, which are around 500 ha (the maximum permissible area) for all watersheds expect for WS-II in Panchmahal district, where it is 650 ha. The watershed areas in all watersheds are either equal to or slightly more than the net sown areas. As 500 ha of land areas are allowed for development, the PIAs invariably select villages having around 500 ha of agricultural land areas, and incase where such extent of land is not found in one village, the adjacent village is included (as in WS-III) to increase the total area up to around 500 ha. In WS-II, higher watershed area (650 ha) is allowed because of its higher agricultural land area of the same magnitude.

The average watershed area per household inhabiting the four sample watersheds is found almost be the same around 1.5- 1.6 ha.

As the entire net sown areas are treated under the present watershed programme, the direct benefit of land development, especially the crop output would accrue to the land owning households. In this context we have tried to examine the land holding position of all households across the sample watersheds to find out the magnitude of landless who would hardly get a share in the incremental crop output. The data in this regard as shown in table 2.2 indicate that about 13 % of the total households in the two watersheds of Panchmahal district are landless who would be deprived of the sustained income/ output benefit. In contrast, in the tribal/ hill district almost all households have a share in the possible increase in crop output, as there is hardly any landless in the two watersheds: in WS-III, less than 2% are landless while there is no landless in WS-IV. In addition, almost all households (above 80 %) of the hill watersheds are tribal and may be categorized as socially disadvantaged. Such socially deprived families are few and far between in the plain district of Panchmahal: the total SC/ST accounting for about 38% of total households in WS-I and 26 % in WS-II. The equity implication of income transfer from the watershed development programme thus favours the hill watersheds more than those of other watersheds in the plains.

Table 2.2: Distribution of Landless and SC/ ST households

Information Type	Non-Tribal (Panchmahal) Dist		Tribal (Dahod) Dist	
	WS-I	WS-II	WS-III	WS-IV
1. Total households	315	412	330	325
2. % of Landless	13	13	1.5	0
3. % of ST	6	27	83	93
4. % of SC and ST	26	38	83	100

2.2. RAINFALL

The potential and actual impacts of the watersheds depend on the rainwater that could possibly be harnessed and saved from runoff loss. In this context it is important to know the extent and pattern of rainfall over the sample watersheds. While rainfall data are not available for each watershed, information available with one of the PIAs in each district have been analysed (table 2.3) and generalized for the other watershed in the same district. In fact, although the magnitude may vary, the difference between the average and the actual rainfall could be generalized for the entire state, which has witnessed successive droughts in the last two years (1999 and 2000).

Table 2.3: Distribution of average and actual rainfall (mm)

Information Type	Non-Tribal (Panchmahal) Dist		Tribal (Dahod) Dist	
	WS-I	WS-II	WS-III	WS-IV
1.Average rainfall (1991-2000)	872		764	
2.% of Average rainfall during June-Aug	69		71	
3.Actual rainfall in 2000	475		244	
4.% of Actual rainfall during June-Aug	96		98	

[Source: Anarde Foundation, PIA of WS-I and Sadguru, PIA of WS-III]

The rainfall data indicate that the watersheds in both the districts receive an average annual rainfall of about 800 mm, of which about 70 % is received during three rainy season months of June-August. Proper harvesting of this water through suitable soil/ moisture conservation methods would not only help in recharging the ground water, but it would also facilitate better growth of natural resources including agricultural crops in the area. The favourable impact of the watersheds in this regard should be immediately felt and visible depending on the time/ year of completion of the watershed and the actual rainfall received in the catchment areas since then. In this background one may see that since 1999, when most of these watersheds were completed, there have been scanty rainfall received across all watersheds, resulting in recurring droughts. The data in table 2.3 shows the actual rainfall recorded in the study areas in the year 2000, which is about 30-50% of the average rainfall. This constraint has to be kept in view when we analyse specific impact of the watersheds.

Regarding the other climatic condition, there is not much variation noticed: the highest and lowest temperatures are recorded around 40^0 C and 10^0 C respectively.

2.3. SOCIO-ECONOMIC PROFILES OF THE SAMPLE HOUSEHOLDS

As mentioned in the previous chapter, the present assessment exercise is based on survey of four diversified watersheds and sample households representing a minimum of 10 % of total households in each of the four selected watersheds. The sample households include various user groups such as beneficiaries and non-beneficiaries as well as landless and land holding groups. As one of the primary objectives of the study is to assess the poverty alleviation aspect of the watershed programme, the sample selection is slightly biased in favour of the weaker sections, especially the landless labourers and marginal farmers. So, while all sections of households are included in the sample, higher % of socially and economically disadvantaged groups are covered in the sample. The detail socio-economic profiles of the sample households across all four watersheds are presented in table 2.4

A very large number of all sample respondents (69 %) are illiterate. The highest illiteracy (97 %) is found among the households of WS-IV in the tribal district. However, such literacy and education status for each watershed cannot be generalized across districts, as in the same tribal district (in case of WS-III) we find also the lowest illiteracy (32 %) rate. Middle and higher educated are found more in WS-I (12 %) as compared to 2% and 3% in case of WS-II and WS-III respectively.

The dwelling characteristics also indicate divergent trends within the same district. While higher % of kutcha houses are found in both WS-I (plain district) and WS-III (tribal district), higher % semi-pucca houses are also found in the same districts in case of the other two watersheds, WS-II (plain district) and WS-IV (tribal district). Pucca houses are found to a smaller extent in all watersheds, except in WS-I where none of the sample households are found with a pucca house. The highest % of pucca house (18) is found in WS-IV.

Table 2.4: Socio-Economic Profile of sample households

SL. No.	Information Type	Watershed No.				All Watersheds
		I	**II**	**III**	**IV**	
1	**Total Respondents**	52	41	32	36	161
2	**Education Status**					
	% Illiterate	69.2	68.3	37.5	97.2	68.9
	% Primary education	19.2	29.3	56.3	2.8	25.5
	% Middle education	9.6	0	3.1	0	3.7
	% Higher education	2.0	2.4	3.1	0	1.9
3	**Dwelling Status**					
	% Kutcha house	55.8	19.5	78.1	15.6	40.4
	% Semi-pucca house	44.2	73.2	15.6	66.7	42.2
	% Pucca house	0	7.3	6.3	17.7	17.4
4	**Land-holding status**					
	% Landless	32.7	24.4	15.6	0	19.9
	% Marginal farmers	67.3	34.1	40.6	88.9	58.4
	% Small farmers	0	41.5	40.6	11.1	21.1
	% Medium farmers			3.1		0.6
5	**Family earnings**					

	Average family members	5	5	8	7	6
	Average earning members	2	2	3	3	2
	Average monthly income-Rs	723	916	1083	1283	969
	Average income per earning member- Rs	362	458	361	428	485
	Per capita monthly income	145	183	135	183	162

[Source: PDI survey- 2001.
Note: watershed numbers I and II are in the plain district of Panchmahal, and the III and IV are in the tribal district of Dahod]

The landholding status of the sample households (table 2.4) indicates that, in all about 20% are landless. Higher landless are however found more in the plain district (WS I and II) as compared to the hill/ tribal district (WS III and IV). A very large majority (58%) of the total sample households are marginal farmers having a landholding up to 1 ha, while about 21% are found to be small farmers having an average landholding of 2 ha. Medium farmers are found in the sample of WS-III.

There is also a distinct inter-district trend found with regard to the family size of the respondents, which was quite higher (7-8) in the tribal district (WS- I and II) as compared to the family size (5) of the plain district (WS-I and II). Higher family size also means higher average earning members (3) in the tribal watersheds than that of the other watersheds (2). The average monthly income of all sample households works out to Rs 969 ranging from Rs 723 (WS-I) to Rs 1283 (WS-IV). The lower average family income in the plain district (WS-I and II) is because of higher % of landless labourers and smaller family size (and earning members) in this region.

2.3.1 Beneficiary Status

The sample respondents also included beneficiaries and non-beneficiaries' groups. A household is considered beneficiary if it is a member of the watershed association (WA) and if it has accordingly contributed to the watershed development fund created at the watershed level. Although all households in a watershed village are supposed to be members of WA, many of them, especially the landless and a few of the landholding households who didn't get equitable share in the development process, are found to be non-members. Table 2.5 shows the distribution of such beneficiary and non-beneficiary among the sample households.

Table 2.5: Beneficiary status of sample households

SL. No.	Respondent category	Watershed No.				All Watersheds
		I	**II**	**III**	**IV**	
1	Beneficiaries/ Members of WA	31 (59.6)	27 (65.9)	32 (100)	31 (86.1)	121 (75.2)
2	Non-beneficiaries	21 (40.4)	14 (34.1)	0	5 (13.9)	40 (24.8)

3	Total	52 (100)	41 (100)	32 (100)	36 (100)	161 (100)

[Source: PDI survey- 2001
Note: Figures in parentheses indicate %.]

A large majority of all sample households (75 %) are found to be beneficiaries. Higher % of beneficiaries is found in the tribal/ hill watersheds (III and IV). In fact in watershed III, all of its households (even the landless) are found to be members of WA, and we didn't find any non-beneficiaries in our sample in the same watershed. In watershed IV, even though, all of its households are landholders, many of them are not members of WA because of various reasons. In watersheds I and II, the non-beneficiaries are mostly landless labourers. A 100 % membership and beneficiary status indicates effective people's participation and institutional mechanisms, which are found only in WS-III.

2.4. PREVAILING OTHER GOVT SCHEMES/ FACILITIES

In addition to the present watershed development programme, there are other government schemes/ facilities also available in the watershed villages, as shown in table 2.6. Primary school and hand pump facilities are available in all watershed villages. The wage employment schemes (JRY/JGSY) are also found in all villages, but these schemes got implemented only in the current year (2001) to meet the drought situation: the labourer groups didn't have access to such schemes in the previous years.

Table 2.6: Availability of other govt. schemes/ facilities

Other Govt. Schemes	Whether available: Yes/ No			
	WS-I	WS-II	WS-III	WS-IV
1. JRY/ JGSY	Yes-Recent	Yes-Recent	Yes-Recent	Yes-Recent
2. IAY	No	No	Yes	Yes
3. SGSY/ IRDP	No	Yes	Yes	No
4. Hand pump	Yes	Yes	Yes	Yes
5. PDS	No	No	Yes	Yes
6. Primary school	Yes	Yes	Yes	Yes
7. Night school/ NFE	No	No	No	No

[PDI Survey- 2001]

The hand pump facilities, although available in all villages, many of these are not functional especially in WS-I and WS-III. It may also be noted that when the watershed development programme was introduced around 1996 such hand pumps were not

found in many of these villages, especially in WS-III: the PIAs helped and facilitated implementation of these facilities.

Regarding the other schemes, the housing scheme for poor (IAY) and the PDS are found only in the tribal watershed areas (WS- III and IV). Similarly, the self-employment scheme and activities relating to formation of self-help group (SHG) are found to a limited extent only in WS-II and III.

Non-formal education centers or the night schools are conspicuous by their absence in all the four watersheds.

Chapter- 3
PROGRAMME IMPACT

In this chapter we have documented the types of activities carried out in the four sample watershed areas and the expected/ actual impacts of such activities on the natural resources and village economy.

3.1. ACTIVITIES UNDERTAKEN

The work activities of the sample watersheds commenced around end of 1996 and got completed around early 2000. The details of activities carried out and expenditure incurred in each of the four sample watersheds are described in table 3.1. Land and water resource development activities constitute the primary areas of intervention in all watershed areas.

Table 3.1: Details of activities undertaken

% of total expenditure

Activity Type	Watershed No./ Name			
	I Nani Kankdi	**II** Demli	**III** Goria-Dhadela	**IV** Ambli
1.Land and soil management	45.22	16.39	32.53	38.78
2. Drainage Line Treatment	11.99	13.34	13.25	3.09
3. Water Resource Development	33.19	50.30	37.49	10.08
4. Nursery and Plantations	8.83	13.99	15.33	33.20
5. Agri Extension, livestock, etc	0.77	5.98	1.40	14.85
Total (Rs in Lakh)	100.0 (14.08)	100.0 (19.75)	100.0 (15.62)	100.0 (14.88)

[Source: PDI Survey- 2001.
Note: watershed numbers I and II are in the plain district of Panchmahal, and the III and IV are in the tribal district of Dahod]

The land/ soil management operations included land leveling, contour bunding, terracing and gully plugging, which were carried out entirely in private agricultural land areas to improve the soil moisture regime in the watershed areas. The extent of land development activities depended on the physiographic conditions, and so the agricultural areas in the watersheds (I, III and IV) having higher land slopes required more soil work, resulting in relatively higher expenditure. In watershed II, expenditure on land development constituted about 16 % of total expenditure

compared to about 32-45% in other watershed because of its flatter terrain. The other main activity is development of water resources by way of constructing farm ponds, tanks, wells and check-dams in agricultural farm lands owned by farmers as well in other lands owned by the community or the government. In all watersheds (except in IV), about 33-50% of total expenditure was incurred in the development of new water resources. In watershed IV, where only about 10 % has been spent on development of new water sources, there is not much scope for development of such sources (pond, tank, etc) because its agricultural lands are located at a higher elevation in sloppy terrain. There are streams flowing in this hill watershed, and efforts had already been made earlier by other NGO (Sadguru) to harvest the stream-flows. The present land management activities in WS-IV, especially the terracing and contour bunding supplemented the previous water harvesting efforts in effectively conserving the land and water resources.

In order to improve the biomass resources through plantations of fuel wood, fodder and fruit species, nursery and plantation activities have been undertaken in cropland as well as in community land areas to varying extent in all watershed. Highest expenditure (33 %) in this regard is incurred in the hill watershed (IV) and the lowest expenditure (9 %) is found in the plain area (WS-I). In the plain district (WS I and II), the plantation activities are confined to mainly the cropland areas in the form of agro-forestry, while in the hill watersheds (III and IV); Community land areas are also substantially covered under fuel wood and fodder plantations.

In addition to these main activities, extension services are also provided to improve crop management and livestock management practices in the areas. However, significant expenditure in this regard is found in only WS-IV (15 %) and WS-II (6%).

3.1.1 Land Type Affected by Watershed Activities

The watershed activities discussed above have mostly influenced the cropland areas in all watersheds thereby benefiting only the land owning households, as shown in table 3.2. In the hill watersheds, especially in WS-IV, however, higher proportions of community wastelands have been developed by way of community plantations, etc., the benefit from which would also be available to the non-landholders.

Table 3.2: Details of Land types developed under watershed programme

% of total watershed area

Activity Type	Watershed No.			
	I	**II**	**III**	**IV**
1.Crop Land Area	92.2	100.0	86.9	68.1

2. Community Land Area	7.8	0.0	12.1	31.9
3. Total Watershed Area (Area in ha)	100.0 (500)	100.0 (650)	100.0 (489)	100.0 (495)

[Source: PDI survey- 2001.]

3.2. IMPACT ON CROP AREA AND PRODUCTION

The land development and creation of new water resources in all watershed areas have effectively brought some additional areas under crops in both Kharif and Rabi seasons. The cropping pattern data collected from the sample farmers (table 3.3) indicate that paddy and maize are important cereals grown in kharif along with also some pulses manly in the tribal Watersheds (III and IV). In the Rabi season, pulses and wheat are dominant crops in all watersheds except in WS-I, where vegetables are grown to a large extent.

Table 3.3: Crops grown by season

% of Area/ plots

Season	Crop	Watershed No.				All Watersheds
		I	II	III	IV	
Kharif	Paddy	42.1	49.2	26.3	27.6	35.2
	Maize	14.0	47.6	29.5	53.4	35.5
	Bajra/ other cereal	21.0	0.0	0.0	0.0	4.4
	Pulses	5.3	3.2	37.9	17.2	18.7
	Vegetable	17.5	0.0	4.2	0.0	5.1
	Oilseed	0.0	0.0	2.1	0.0	0.7
Rabi	Wheat	14.0	39.7	30.0	28.2	29.1
	Bajra	26.0	35.3	0.0	0.0	5.0
	Maize	0.0	22.1	23.8	0.0	14.7
	Pulses	10.0	0.0	36.2	71.8	36.4
	Vegetables	50.0	0.0	10.0	0.0	13.9
	Oilseed	0.0	2.9	0.0	0.0	0.8

[Source: PDI survey- 2001]

In the recent years, with the improvement in soil moisture regime and availability of irrigation water from the newly created water sources, there is increased preference for growing improved variety of maize and pulses (gram) in both the seasons and for wheat in Rabi season. We discussed with the sample farmers to find out if at all there was any overall increase in crop yield since the commencement of watershed development programme in 1996. Although, there was hardly any increase in crop production during the last two crop years (1999-00 and 2000-01) because of successive droughts, there was general consensus that the crop damage was less severe compared to similar drought years prior to the watershed programme in 1996. In fact in the crop year of 1998-99, which was a good rainfall year, and when the land leveling works in many watershed areas were already completed or were about to be completed, there was a significant increase in their crop production. The responses of the sample farmers in this regard, as summed up in table 3.4, indicate

that above 83 % of farmers in all watersheds experienced some increase in crop productivity, although there was marked variations regarding the extent of yield increase across different watersheds.

Table 3.4: Increase in crop yield experienced by farmers (during 1998-99)

% of all farmers/ cultivators

SL. No.	Crop yield information	Watershed No.				All Watersheds
		I	II	III	IV	
1	Increased yield reported	83.9	100.0	85.2	100.0	92.8
2	**Extent of yield increase**					
	a. Up to 5%	0.0	80.6	8.7	0.0	23.3
	b. 6-10 %	15.4	12.9	30.4	0.0	12.9
	c. 11-25 %	73.1	6.5	52.2	0.0	28.4
	d. 26-50 %	11.5	0.0	8.7	2.8	5.2
	e. 51-100 %	0.0	0.0	0.0	75.0	23.3
	f. Above 100 %	0.0	0.0	0.0	22.2	6.9

[Source: PDI survey- 2001]

While up to 25 % of yield increase was reported in the first three watersheds, doubling the yield level was mentioned in the fourth watershed in the hill district. Such high increase in crop yield in WS-IV is explained by the fact, prior the programme, the un-terraced farmlands in the sloppy hill terrain were not able retain the rain water, and so the yield levels of crops were very low compared to all other watersheds. So, after the programme, when these farmlands got leveled with firm stonewalls to prevent any runoff loss, the yield levels showed marked improvements. The yield levels of major crop groups, before and after the project, as shown in table 3.5, indicate that as the pre-project yields were lower in the hill areas, especially in WS-IV, the % growth in the yields appear higher.

Table 3.5: Average Crop yields before after the project

SL. No.	Crop yield of cereal and pulses	Watershed No.			
		I	II	III	IV
1	**Before Project**				
	a. Cereal (maize): kg/acre	800	1000	750	600
	b. Pulses (gram): kg/ acre	250	300	200	180
2	**After Project (1998-99)**				
	a. Cereal (maize): kg/acre	1000	1100	1000	1000
	b. Pulses (gram): kg/ acre	350	350	300	300
3	**% Increase in yield**				
	a. Cereal (maize)	25	10	33	67
	b. Pulses (gram)	40	17	50	67

[Source: PDI survey- 2001]

The findings (table 3.5) also indicate that, even with higher % growth in the yield levels, the present yield levels in hill watersheds (III and IV) are slightly less than those of the plain watersheds (I and II). Thus, the watershed programme seems to have bridged up the yield differences in the low productivity region (hills) and the high productivity region (plains). The findings also indicate that the yield increase is higher in rabi season for pulses across all watersheds and this indicates the overall effectiveness of soil moisture conservation activities. Because of higher moisture availability in rabi season, farmers have also started growing maize and wheat crops in addition to pulses in selected fields/ plots.

The above yield information is based on farmers' recall of 1998-99 (a normal rainfall year), when the watershed activities were not fully completed. So, it is possible to still increase the present yield levels mentioned above through introduction of new cultivation practices. However, assuming that the new yield levels are at least maintained, we have tried to estimate the total value additions to the four watershed areas.

Total Additional crop areas and output

The information on additional areas under crops after the project, collected from the PIAs, are examined along with the yield information collected from the sample farmers to quantify the total additional crop outputs generated for each watershed area. Table 3.6 presents this information.

The project has effected an increase in total cropped area to the extent of 110-163 ha across the sample watersheds, resulting in increased availability of food grains in excess of 900 quintals in each watershed. These findings imply that in a good rain fall year, the watershed areas would get additional food grains ranging from 900 quintals (WS-III) to about 1500 quintals (WS-II) if the present trend continues. Thus, on an average, a family in all the watershed areas, would get a direct consumption benefit of about 300 Kg of food grain per annum in a average rain fall year.

Table 3.6: Additional crop areas and outputs generated in a crop year

SL No.	Additional Crop Area and output	Watershed No.			
		I	**II**	**III**	**IV**
1	**Increase in crop area in Kharif**				
	a. Area under cereals- acre	60	60	43	72
	b. Area under pulses- acre	0	28	40	0
2	**Increase in crop area in Rabi**				
	a. Area under cereals- acre	50	68	20	30
	b. Area under pulses- acre	0	0	60	40
3	**Total increase in crop area**				
	a. Area under cereals- acre	110	128	63	102
	b. Area under pulses- acre	0	28	100	40
	c. Total area- acre	110	156	163	142

4	**Total increase in crop quantity**				
	a. Quantity of cereals- Quintal	1100	1408	630	1020
	b. Quantity of pulses- Quintal	0	98	300	120
	c. Total grains- Quintal	1100	1506	900	1120
5	**Total increase in crop value**				
	a. Value of cereals- Rs in Lakh	6.6	8.5	3.8	6.1
	b. Value of pulses- Rs in Lakh	0	1.2	3.6	1.4
	c. Total Value- Rs in Lakh	6.6	9.7	7.4	7.5
6	Ratio of crop value (5c) to Total Expenditure on WS activities-%	46.9	49.1	47.4	50.4

[Source: PDI survey- 2001]

We have attempted in the above table to work out the monetary value of the incremental crop output in the watershed areas by taking into consideration the average farm harvest prices of the food grain categories. The annual value of additional crop output generated works out to Rs 6.6 lakh in WS-I to about Rs 9.7 lakh in Ws-II. The gross values of such additional crop outputs across all watersheds work out to about 47-50 % of total expenditure on all watershed activities.

3.3 IMPACT ON TREE/ FODDER PLANTATIONS

The land and water harvesting activities brought in additional cultivable areas under food crops resulting in additional food grains to the all the watershed communities. These villagers were also provided with fuel wood and fruit saplings, as apart of the watershed development programme, to meet their fuel and fodder requirement in near future. The quantum impact in this regard may be seen from the extent of plantations activities carried out, as shown in table 3.7.

Table 3.7: Details of Tree/ Fodder Plantations

SL No.	Plantations Activities	Watershed No.			
		I	**II**	**III**	**IV**
1	Fuel wood plantations- Number	2,000	1,12,250	1,53,546	22,750
2	Horticultural Plantations- Number		4,160	750	500 (17 ha)*
3	Pasture development- ha	36	-	1	18
4	% of Total project expenditure on Community land development	8.5	0	15.0	32.5

[Source: PDI survey- 2001. * Horticultural plantations in community lands]

Fruit saplings have been given to farmers in all watersheds for plantations in their own farm/ homestead lands. On an average, farmers in different watersheds have

planted 2- 10 fruit trees. Such horticultural plantations on farmlands are more extensively carried out in WS-II in the plain district. In the hill district, especially in WS-IV, horticultural plantations have also been carried out in community lands. The outputs (fruits) from these plantations will be available as a direct consumption benefits to the villagers in 3-4 years and add to their nutrition status.

Fuel wood plantations have also been undertaken (table 3.7) in all watersheds. In WS-II, the entire fuel wood plantations are found in field bunds, and fallow farmlands, while similar plantations in other watersheds (WS-I, III and IV) are carried out mostly in community lands, where the non-land holders (landless) may also share the fuel benefit.

Pastureland development works to provide fodder to stall fed animals like cows and buffalos have been carried out in only two watersheds (WS-I and WS-IV) in both the districts. However, in none of the watershed areas, including the two watershed areas of pastureland development, there is any community agreement regarding practice of controlled grazing or stall feeding, so as to facilitate biomass growth and check further land degradation in specific community land areas. The programme, thus, does not seem to have a strong positive impact on sustained fodder availability and scientific livestock practices.

It may also be seen in table 3.7 that development of community land has hardly received any priority in the first two watersheds in the plain district, where a maximum of about 8.5 % of total project expenditure is devoted to community land development works. In contrast in the hill/ tribal district (WS-III and IV), 15-32 % of total project expenditure is for development of community land resources.

3.4 IMPACT ON LIVESTOCK HOLDING AND GRAZING PRACTICES

In order to further explore the aspect relating to livestock practices, we asked our sample households about their livestock holdings to know whether there has been reduction in the number of open grazing animals (goat/ sheep) in favour of more of stall fed animals (cow/ buffalo). The households reporting possession of these livestock categories are shown in table 3.8.

Table 3.8: Respondents reporting various livestock holding and purchase

% of all respondents

SL No.	Livestock Information	Watershed No.			
		I	**II**	**III**	**IV**
1	Having cow/ buffalo	38.5	56.1	71.8	83.3
2	Having goat/ sheep	34.6	41.5	40.6	80.5
3	Having Poultry birds	36.5	26.8	3.1	0.0
4	Purchased cow/buffalo during last 2 years	15.4	24.4	37.5	0

[Source: PDI survey- 2001]

In all watersheds milk and meat generating animals/birds are kept by a large number of sample households to supplement their food items and cash resources. While cows/ buffalos are kept for sourcing domestic milk consumption of children, goat/ sheep are mainly for market. While about 38-56 % of sample respondents reported having cows/ buffalos in the first two watersheds of the plain district, the same was found among 71-83 % of households in the hill district. About 15-37% of households in all watersheds (except in WS-IV) reported purchasing of cow/ buffalo after the implementation of watershed programme, during the last two years. However, such addition of milch animals to the livestock holding did not take place at the expense of goat/ sheep. A large number of households, 34-41 % in first three watersheds and 80% in WS-IV, continue having the same or more number of sheep/ goat. Thus, strict stall-feeding is not followed in any of the watershed areas. The large number of goat keeping households across all watersheds, especially in the hills, facilitates the on-going process of land degradation of the community land areas.

Even the stall-feeding animals like cows/buffalos/ bullocks are not entirely stall-fed. These animals also open graze in community/ pastureland areas. In the absence of a clear and agreed livestock holding and grazing practices, there cannot be a favourable long-term impact on conservation of common land resources.

3.5 IMPACT ON EMPLOYMENT GENERATION

The watershed development programme has a significant positive impact on creation of employment opportunities for the villagers, both landless as well as landowners. The quantitative impact in this regard, as shown in table 3.9, indicates varying employment effects across watersheds.

The expenditure on labour as % of total expenditure on all watershed activities is an indicator labour intensive operation being carried out in a given watershed. In this connection, we find a minimum of 43-45 % of total expenditure on labour in two of the watersheds (II and IV), while still higher labour expenditure is found in WS-I (63 %) and the highest (79 %) in WS-III. Corresponding to the actual amount spent on labor, employment has been created during the four-year operations to the extent of about 17000 of man-days in WS-I to the highest of 31000 of man-days in WS-III. The average employment generation per ha of watershed areas works out to 33-34 days in WS-II and IV, 44 days in Ws-I and the highest of 63 days in Ws-III. The same inter-watershed trend is found with regard to man-days of employment generated per each household in a watershed. In two of the watersheds (II and IV), about 50 man-days of employment were created for each household, while it was 70 days in WS-I and about 90 days in WS-IV.

Table 3.9: Expenditure on labour and man-days of employment created

SL No.	Employment Information	Watershed No.			
		I	II	III	IV
1	Total Expenditure on labour- Rs lakh	8.88	8.55	12.34	6.68
2	Labour as % of total expenditure-%	63	43	79	45
3	Man-days of employment-Number	22,208	21,380	30,855	16,711
4	Avg man-days per ha of WS area	44	33	63	34
5	Avg man-days per household	70	52	93	51

[Source: PDI survey- 2001]

The watershed activities were carried out during 4 years from 1996-97. However, the operations were significantly taken up since 1997-98, and about 40-50 % of expenditure was incurred in the drought year of 1999-2000 in WS-I, II and IV, while in WS-IV, the same activities were extended even to the subsequent drought year (200-01). The watershed programme has, thus, significantly provided employment opportunities to the needy households when they needed the employment most in the drought years, when there was no other wage employment for them from the government especially in 1999-00. (Limited help from government was available only March 2001)

The households across watersheds, not only got employment in times of their need in drought years, they even got higher wage rates (Rs 40 per day) compared to what was offered to them (Rs 25) in other government programmes, and they didn't have to pay any bribe or cut to get the employment and other benefits from the watershed programme.

3.6 PEOPLE'S PERCEPTIONS

The sample households were asked about what they felt were the main impacts of the watershed programme in their villages. The responses of the households indicating their perceptions of the programme impacts are described in table 3.10.

Table 3.10: Perceptions of households regarding likely impact of watershed

% of all households

SL. No.	Various Perceptions	Watershed No.				All WS
		I	II	III	IV	
1	There will be more crop production	71.2	65.9	100	97.2	81.4
2	There will be more fuel wood/ fodder	98.1	85.4	84.4	100	92.5
3	There will be less soil erosion	96.2	78.0	75.0	97.2	87.6

4	There will be more ground water	94.2	85.4	93.8	100	93.2
4	There will be more employment	96.2	90.2	100	97.2	95.7

[Source: PDI survey- 2001]

The sample households included both landless and landowners. Their overall perceptions indicate that employment benefit is the most favourable impact of the watershed programme, indicated by above 90 % of households in all watershed areas. Equally important is the perception regarding improvement in ground water condition overwhelmingly reported by 85-100% of households across all watersheds. Next in importance is the general perception that the overall biomass cover will improve resulting in higher availability of fuel wood and fodder, especially the latter: this aspect of the programme impact is indicated by a minimum of 84 % of households in each watershed area. Similarly, a minimum of 75 % of responses across the watersheds indicates the positive impact of the programme on soil-moisture conservation. That the project will also help in increasing the agricultural output is highly perceived by a minimum of 66 % of households. The impact regarding the agricultural output is indicated by almost the entire households in the hill district (WS-III and IV), where there is hardly any landless. The landless found more in the plain district (Ws-I and II), are not sure of crop benefit, and so the overall perception in this regard in these watersheds has been somewhat lower.

As both the landless and the landowners have got the employment benefit, a very large majority in all watersheds has felt this aspect of the programme impact. However, it is important to note that the households, irrespective of their landholding status across all watersheds, have highlighted the positive impact of the programme on improvement in ground water conditions.

Our group discussions in all watershed villages reveal that there is a general improvement in the ground water levels. In spite of the recurring droughts (in 1999-2000 and 2000-01), water was available in many village wells even in April- May 2001: Water in these wells was not available in similar drought years prior to the watershed programme.

Chapter- 4
INCOME DISTRIBUTION

In this chapter we have made an attempt to find out how the diverse benefits from the project, especially the tangible economic benefits have accrued to various groups of households or user groups. The main purpose of this chapter is to assess the degree of equality or inequality in the income distribution process. In this context we have analysed how and to what extent different groups have participated in the watershed development programme and shared various types of income/benefit flows.

4.1. DISTRIBUTION OF RECURRING INCOME BENEFIT

The households in a watershed area may be broadly categorized into two groups "landless" and "landowners" or "beneficiaries" and "non-beneficiaries" so as to find out number of direct beneficiaries or the households who have got the direct benefit of land development. Although, all groups will get the environmental benefit of overall biomass improvement and ground water improvement, the distinction between beneficiary and non-beneficiary is made on the basis of receiving the tangible and recurring income benefit from the project in the form of land and crop improvement. In this sense, the landless would be considered non-beneficiaries unless they are provided with permanent source of income or a stake in the community resource base. Similarly, the landowners, who would get the recurring income benefit in the form of increased crop output, cannot be considered under one group, as only some of them may get direct benefit of land and water and thereby realizing a much higher increase in crop output. So, in a watershed area, if the land/ water resources do not directly affect all areas, some of the landowners cannot strictly be called beneficiaries, even though they may get some improvement in crop productivity through overall improvement in the soil moisture conditions. Thus, there may be beneficiaries among landless incase of land/ usufruct distribution or non-beneficiaries among landowners in case of lack of access to land/ water development activities. The equality in income distribution and success of the programme depends on the magnitude of the beneficiary households.

In table 4.1, we have shown the number of beneficiary households among the landless and landowners to draw inference regarding the quality of programme implementation and the pattern of income ditribution. The table shows that the landless in the non-tribal district are not beneficiaries or members of watersheds who will not get any recurring income flow; their benefit sharing is at best limited only to one time flow of wage income during the project period. In the tribal district, a few landless are found in WS-III, who are all made part of the watershed programme by the village committee by allowing them to have their own dug wells and a few plots for cultivation from the community land areas. In the same watershed (III) in the tribal district, the land or water resources have been developed for all landowners, who are all members of watershed. There is thus 100% participation rate in WS-III, all households even the

landless being beneficiaries and having a share in the land development and annual recurring income flow.

Table 4.1: Distribution of beneficiary and non-beneficiary households

Household Groups	Non-Tribal (Panchmahal) Dist		Tribal (Dahod) Dist	
	WS-I	WS-II	WS-III	WS-IV
1. Total households	315	412	330	325
2. Number of Landless	41	54	5	0
a.No.of Beneficiaries	0	0	5	0
b.No. of non-beneficiaries	41	54	0	0
3. Number of Landowners	274	358	325	325
a.No.of Beneficiaries	212	165	325	210
b.No. of non-beneficiaries	62	193	0	115
4. Total Beneficiaries	212	165	330	210
5. **% of Beneficiary HHs**	67	40	100	65

[Source: PDI survey- 2001.]

Barring WS-III, in all other watersheds, efforts have not been made to distribute the direct land development benefits among even the landowners, let alone the landless. In all these (I, II and IV) watersheds a substantial portion of even the landowning households are found to be non-beneficiaries who are also not members of the watershed association. The participation rate, measured by the % total beneficiary households, in these three watersheds ranges between a minimum of 40 % in case of WS-II to maximum of 65-66% in case of other two watersheds (I and IV). Thus, minimums of above 30 % of households in these three watersheds have no direct access to land and water resources developed in the watershed areas.

Many of these non-beneficiaries among the landowners, especially in the first two watersheds, have taken fuel wood and fruit species and planted on their field bunds and homestead areas. Many of these non-beneficiaries across all watersheds, who mostly reside in the lower ridges, have also experienced some increase in crop yield in good rainfall year because of improvement in moisture availability. In contrast, the non-beneficiaries among the landless, who form about 13 % of total households in WS-I and II, do not receive even these fringe benefits. For these landless, wage employment was the only tangible benefit, which was not forthcoming after the programme period, and they wanted the same to be continued.

4.2 DISTRIBUTION OF WAGE BENEFIT

As we have seen in the previous chapter, substantial amount ranging between 43-79 % of total expenditure has been spent in the watershed areas, creating employment opportunities for the landless as well as other landowners who are willing to take up labour work. Unlike the crop benefit, which is shared by the landowners, the wage benefit is not entirely meant for the landless. Both these (landowners and landless)

groups have shared the wage benefit. As the land development works are carried out almost entirely in croplands, the landowners have the first choice of working on their own lands. In case of difficult land operations and when the landowners are not available for manual work in rare cases, landless have also participated in the development works. Across all watersheds, about 80-90 % of the beneficiary landowners have worked as labourers in their own land areas along with the landless groups.

From our sample households, we have found out the extent to which the landless and the beneficiary landowners have participated in the wage employment programme during the last two years (1998-99 and 1999-00) of the watershed programme. The findings are presented in table 4.2

Table 4.2: Employment received by landless and beneficiary landowners

Number of days

Employment Information	WS-I	WS-II	WS-III	WS-IV
1. LANDLESS LABOUR				No
a. Year-1	60	11	49	Landless
b. Year-2	55	10	43	
c. Total	115	21	92	
d. Average per year	57	11	46	
2. LANDOWNERS (BENEFICIARIES)				
a. Year-1	69	56	58	67
b. Year-2	42	24	49	52
c. Total	111	80	107	119
d. Average per year	55	40	54	60

[Source: PDI survey- 2001.]

The landless are significantly found in the first two watersheds in the non-tribal/ plain district. In the first watershed (WS-I), both groups of the landless and landowners have equally participated in the wage employment programme, both groups have worked for about 55-57 man-days per annum on an average. This implies that the wage basket in this (WS-I) area has been equally shared. In contrast, in the second watershed (WS-II), not only there is an overall fall in the total man-days created (because of lower ratio of labour expenditure), the participation of landless group in the work programme is much lower than that of the landowners. In this watershed (WS-II), the landowners themselves carried out the land development work in their fields, while limited participation of landless group is found in the development of water resources (farm pond, check dam, etc) and in the treatment of the drainage lines. Thus, in WS-II, the average annual wage benefit of the landless group is limited to about 11 man-days as against 40 days of employment received by the landowners. In the hill district, there is no landless in WS-IV, so the entire wage basket has gone to the beneficiary landowners. In WS-III, where only a few landless found and who are also given the land development benefit, there is not much difference in their average wage woks (46 man-days) as compared to the landowners (54 man-days)

Wage benefit is a one-time benefit, which was available to the participating households mostly for three years during the watershed execution period of 1996-97-1999-00. For the landless group, it was the only tangible cash benefit. However, the share of these landless households in the total wage basket works out to a maximum of 50 % in WS-I and a minimum of about 20% in WS-II. The beneficiary landowners have thus got a higher (50-80 %) share of the wage benefit across the relevant watersheds.

During the watershed period, no other wage-employment programme from government was available in the watershed villages. Hence, both the landless and the small and marginal farmers, participating in the watershed activities, have welcomed the timely wage benefit given to them.

4.3 DISTRIBUTION OF BENEFITS FROM COMMUNITY PLANTATIONS

As we have discussed earlier, there can be other tangible benefits from the community land development activities in the watershed areas. The extent of community lands and the types of benefits that may accrue to various household groups are presented in table 4.3. Although, not much of community activity found in most watersheds, there is hardly any community land development activity found in WS-II, where highest watershed expenditure (and land area) has been involved. The fuel wood and fruit plantations carried out in this (WS-II) watershed were in private lands benefiting only a small fraction (40%) of landowners as already discussed.

Table 4.3: Community management and sharing of community plantations

Community Plantations Information	WS-I	WS-II	WS-III	WS-IV
1.Land area developed- ha	36	0	NA	93
2.Type of plantations	Mainly fodder/ grass	-	Fuel wood & fodder	Fruit, fuel wood & fodder
3.Whether mode of distribution agreed	Yes	-	Yes	No
4. Which group will get the benefit	All	-	All	Beneficiaries
5.Whether plantation area protected from open grazing	No	-	No	No

[Source: PDI survey- 2001.]

Benefits from Community lands are available in the other three watersheds. In WS-I, 36 ha community lands are developed with mainly fodder/ grass plantations and to a limited extent with fuel wood plantations. The benefits mainly the grass from this area would be available for household groups including landless and non-beneficiary landowners. The non-beneficiaries are not given a special stake in this area to compensate for their deprivation in private land development. The same situation

prevails in WS-IV, where 93 ha of community lands have been developed with fruit, fuel wood and fodder species, and the benefits are not to be shared with non-beneficiaries, let alone giving them a higher share.

The hill watersheds (III and IV) are surrounded with forest areas where fuel wood and fodder are easily available for all households, so the community lands activities in the watershed areas in these villages do not significantly alter the benefit/ deprivation status of any household group. In the plain, however, there is higher demand for fuel wood and fodder, and so the scientific development of community land in these watersheds (I and II) with the active involvement of non-beneficiaries can significantly improve the resource availability and the pattern of income distribution. This aspect is not found in theses watersheds. In fact, in all watersheds, the community land areas are not free from open and un-controlled grazing. There is no agreement on how this area should be protected and scientifically developed so as to give a boost to the dairy and allied activities in the watershed areas, where the non-beneficiaries could play a significant role.

The lopsided income distribution pattern found in three of the four sample watersheds, thus, clearly indicates a trend with no development alternatives for a large section of non-beneficiaries consisting of mostly landless and women groups. As a result, in spite of the positive impact of the watershed programmes on crop production and soil/moisture conservation, there is no significant reduction in the gender and income inequality in the project areas.

Chapter- 5
IMPLEMENTATION AND INSTITUTIONAL MECHANISM

The success and sustained impact of the watersheds depend on quality of implementation and creation of an institutional mechanism to maintain and mange the watershed works and other development activities. In this chapter we have examined the implementation mechanisms established in the watershed areas with specific reference to the roles played by the PIAs in the overall project implementation. We have also assessed the maintenance mechanisms established in the project areas and capability of the watershed committees to continue the maintenance and development works after the completion of the project period and withdrawal of the PIAs.

5.1. IMPLEMENTING STRUCTURE

The Central guidelines make it mandatory for the state governments to create an elaborate instructional structure to plan, implement and monitor the watershed development activities at the district levels, where the available funds are disbursed. The details of this defined structure including the implementing agencies at various levels, their key functions and functional status in the selected watershed areas are presented in table 5.1. The overall success of the programme depends on effective working of the five levels of functionaries and effective integration of their services. The role of the PIA, as the programme manager and coordinator, is thus very vital during the project period, as it can directly influence the project level functionaries and activities. In this context, the role of DWAC, which selects, the PIAs (and the project areas) assumes importance. During the early phase of programme implementation in mid-1990s, the DWAC didn't have much of a choice, as there were a few established agencies (mostly in NGOs) available for watershed development works, which all got selected. Our four sample watersheds, as we have seen, are also managed by four different PIAs, all NGOs, many of who were earlier engaged in similar activities. However, we have seen different project impacts across different watersheds depending on types of areas and activities chosen and management practices adopted by the PIAs. Although the same institutional structure is available across all watersheds, we have seen different spending pattern and community approaches, which could be attributed to the existing village level institutions as well as the visions and management approaches adopted by the PIAs.

Table 5.1: Key roles of Implementing Agencies and their functional status in sample watershed areas

SL No.	Implementing Agencies	Composition	Key Roles	Whether functional

1	District Watershed Advisory Committee (DWAC)	DDO/ Collector, DRDA, Line departments, NGOs and Research Institutions	Selection of Project Implementing Agencies (PIAs) and approval of their project proposals.	Yes, at district level
2.	PIA	Govt. Dept. / Panchayat/ NGOs/ Institution	Overall project implementation/ management. Receives fund from DRDA. Formation and capacity development of WC in work execution and fund utilization.	Yes, all being NGOs and located near the project areas at Block level
3.	Watershed Development Team (WDT)	Four subject matter specialists representing Agril. Engg, plant science, vet science and social science	Provide technical guidance and training to village groups and WC. Organise women and other village groups.	Yes, at Block level
4	Watershed Association (WA)	Members from all households, directly or indirectly dependent on the watershed areas.	Approves watershed activities and formation of Watershed Committee for work execution. Makes plan for various user groups (including direct and indict beneficiaries and labour groups) and resolve conflicts among them. Creates watershed development fund based on contribution from all members.	Yes, at watershed/ village level. But the WA does not include non-beneficiaries in three of the four sample watersheds.
5.	Watershed Committee (WC)	A chairman, a full time paid Secretary and 10-11 members of WA representing various user groups and including women and SC/ST.	Carry out the day-to-day project activities in association with PIA and WDT during the project period. Continue the project work and other activities after the project period in association with DRDA.	Yes, at watershed/ village level.

[Source: PDI Survey-2001]

5.1.1 Functional Effectiveness

In the previous chapters, we have shown details of watershed areas and their specific impacts. While the selected areas are all water scarce areas and the dependent people are mostly small and marginal farmers and landless (in the non-tribal district), all user groups in a watershed have not been made part of the WA and shared the direct benefit flows. Except for WS-III, the social impact of the programme is found to be missing in all other sample watersheds. In this context, we have tried to examine the relevant functional details of the PIAs to find out whether the PIA of the successful (in

terms of user groups' participation) watershed (WS-III) has adopted a different implementation approach.

Table 5.2: Details of PIA functioning

SL No.	Information	Non-Tribal (Panchmahal) Dist		Tribal (Dahod) Dist	
		WS-I	WS-II	WS-III	WS-IV
1	Name of PIA	Medhavi	ANaRDe	Sadguru	Utthan
2	No. of village managed	One	One	Two	Two
3	Previous watershed experience	Not much	Yes	Yes	Yes
4	Has in-house training facilities	No	No	Yes	No
5	Involvement of all user groups	No	No	Yes	No
6	% of Total Sanctioned Expenditure on Project Activities	70	76	80	75
7	% of Total Project Expenditure on Labour	63	43	79	45
8	Whether funds from other sources integrated in the project works	No	No	Yes	No

[Source: PDI survey- 2001.]

As shown in table 5.2, all user groups' participation is achieved in WS-III in spite of this watershed having two villages. In all watersheds the household size is about 325, except in WS-II, where it is about 400. Involvement of all these households in the programme perhaps required more time in community management and also higher investment than what was feasible within the project. These constraints could be better managed in WS-III than in all other watersheds. Sadguru, the PIA of WS—III, because of its in-house training and community managers, has been able to organize more meetings with the village groups to assess their diverse needs that needed to be built into the programme components. Similarly, it (Sadguru) has been able to spend much more on project activities, especially on employment creation activities. In fact, it is the only PIA, which has tapped other sources of funding and integrated the same in the extended project works.

The approaches of all other PIAs have been to implement a land development plan within the budget limit, with no planning for all user groups. In this connection, the roles of WDTs in all watersheds are confined to only technical supervisions of watershed works and imparting limited training and extension services relating to improved crop and livestock practices. The WDT is not effective in the area of community organization. Thus, in all watersheds, the services of the WDT and that of the PIAs (except in WS-III) have only benefited one of the user groups- the direct beneficiaries: the landless and other landowners have not been provided with any other income generating activities.

The composition of WA in all watersheds (except in WS-III) is not as per the guidelines, which require memberships of all households who are directly or indirectly dependent on the watershed areas. Thus, all user groups representing direct beneficiaries, indirect beneficiaries and landless have not been formed and represented in three of the four sample watershed areas. The WCs, formed in these watersheds, although represent SC/ ST and women members, don't include members of landless and other non-beneficiaries households.

The WC including a full time secretary from the watershed village has been formed in all watershed villages, as per guidelines, to execute the project work on day-to-day basis and make payment to villagers on agreed lines. All WCs are found to be quite effective in this regard, especially in settling and making prompt payments. None of the sample households had any complaint regarding payment rates and modalities. In fact most of them wanted the present institutional structure to be continued in the implementation of other government programmes as well, so that contractors are not involved and payments are settled at village levels without any cut or bribery payment.

5.1.2 Functional Linkages among Key Players

Successful implementation of watershed projects necessitates effective linkages among all relevant secondary stakeholders in the project area. PIA, being the central implementing authority needs to play a pivotal role in coordinating the services of other key players and linking them with various users' groups. While PIA is the primary stakeholder responsible for the overall implementation, there are other key secondary stakeholders, who are to be effectively linked with the village groups and functionaries. These key secondary stakeholders and the roles expected from them are described in table 5.3. If new project information and services including technology and marketing from these departments/ agencies are made available, there will be renewed interest in many new group enterprises among all village groups, especially the landless and other non-beneficiaries, to participate in the watershed development programme.

Table 5.3: The Key Players and their roles in watershed development

Key Secondary Stakeholders	**Expected Roles/ Services**
Panchayat (PRI)	Identification and Selection BPL and landless for group loan/ subsidy. Transfer usufruct rights of village land/ pond/ tank to selected groups.
Revenue Department	Transfer of revenue wastelands to Panchayats
Other Line Departments (Agriculture, Fishery, Horticulture, Cottage Industries, etc.)	Provide new technology information and training and also departmental subsidies.
Funding Agencies (Lead Bank, Central Govt and other Agencies providing credit/ subsidy)	Provide funds and monitor fund utilization.
Industries/ Technical Agencies	Provide new technology, training and possible buy-back arrangements.
Marketing/ Export Agencies	Product Marketing

In none of the four sample watersheds, except to some extent in WS-III, we find these secondary stakeholders playing any role for the benefit of villagers in general and the landless/ non-beneficiaries in particular. The limited role-play by the PIAs, the primary stakeholders, has not been instrumental in diversification of project activities and thereby effecting involvement of other departments/ agencies in the project areas.

5.2. TRAINING AND FORMATION OF SHGs

As part of the watershed development programme, the PIAs are required to organize training camps in the watershed areas to improve the technical knowledge of WC and WA so as to facilitate decentralized management and improved land management practices. The training programmes are also needed to help villagers in the formation of SHGs with specific reference to formation and activation of group enterprises for landless/ non-beneficiaries, women and other weaker sections who are not part of the on-going development programmes. In this context, the details of traing programmes organized and SHGs formed in our sample watershed areas are shown in table 5.4.

Table 5.4: Status of Training Programmes and formation of SHGs

SL No.	Information	Non-Tribal (Panchmahal) Dist		Tribal (Dahod) Dist	
		WS-I	WS-II	WS-III	WS-IV
1	Number of Training camps held	6	9	20	5
2	Training Topics	Account management, Improved land management practices	Account management, Improved land management practices	Account management, Improved land management practices, Formation of SHGs and women groups, group enterprises for women and other groups.	Account management, Improved land management practices
3	Training programmes for Landless/ non-beneficiaries	No	No	Yes	No
4	Whether SHGs formed and activated	No	No	Yes	No
5	Whether women groups	No	No	Yes	No

	formed and activated				

[Source: PDI survey- 2001.]

The data presented in table 5.4 indicate that training programme have been organized in all four sample watersheds. However, because of in-house training facilities, the PIA of WS-III has been able to organize more training camps and also cover a large number of topics and users' groups. Thus, while 20 training camps have been organized in WS-III, the PIAs in other three watersheds have organized only about 5-9 training camps. In these three watersheds (I, II, and IV), where limited training camps have been held, the training items are confined to account management (for WC) and land development practices (for land- owners/ beneficiaries). There are no training programmes for project activities for landless/ non-beneficiaries and women groups in these three watersheds. As a result, no SHG has been formed by landless and women groups in these watersheds to avail group subsidy and undertake non-farm group enterprises.

5.3. MAINTENANCE OF PROJECT AREAS

During the five-year project period, the PIAs are there at the watershed levels to supervise and coordinate the project execution works, and transfer the development fund to the WC in phases to pay for the works carried out on day-to-day basis. After the project period, when the project activities are completed and the available funds are all utilized, the PIAs are supposed to withdraw from the watershed areas and any operation and maintenance works thereafter are to be carried out by the WA and WC on their own and from their internal fund. In order to ensure that maintenance works don't get affected because of lack of fund after the project period, the PIAs are required to create a Watershed Development Fund (WDF) based on individual contributions of members of WA much before the completion of the project period and their withdrawal from the project areas. WC can carry out the maintenance works in future if such WDF is available with them. Table 5.5 shows the status and extent of WDF created in the sample watershed areas.

Table 5.5: Status of WDF

SL No.	Operation and Maintenance Information	Non-Tribal Dist		Tribal Dist	
		WS-I	WS-II	WS-III	WS-IV
1	Amount of WDF – Rs in lakh	1.01	0.70	0.78	0.84
2	Major Source of contribution	Wage bill	Wage bill	Wage bill	Wage bill
4	Any O&M expenditure yet	No	No	No	No
5	Any O&M plan for Community lands	No	No	No	No

[Source: PDI survey- 2001.]

As is found, watershed development fund of Rs 0.7-1.0 lakh has been created in all watersheds to meet the future maintenance expenditure. As the watersheds are just completed, no maintenance expenditure has been incurred yet in any of the watersheds. Only the beneficiary households, who are members of WA, have contributed to the WDF. As most of the beneficiaries also worked as wage labour in the land development works, an average amount of Rs 10 per day was deducted from their wage bill as contribution towards the WDF. This practice of fund collection was invariably adopted in all watersheds.

As we have mentioned earlier, the land and water resources development works, which require maintenance, are carried out in private land. So, the beneficiaries themselves will attend the yearly maintenance works relating to leveling and bunding. Only the new water resources structures may need some major maintenance, which could be met from the WDF. Although limited community lands are affected (in only WS-I, III and IV), there are no clear management plans and maintenance schedules worked out for these areas.

5.4. SUSTAINING THE PROJECT AND DEVELOPMENT WORKS

The creation of watershed development fund would enable the WC to carry out the required maintenance activities. But, can the WC take up other development works and diversify the watershed activities and bring more benefits to the areas and the willing participants in the programme? What is the capability and willingness of the WC and the WA to continue the development works in the absence of the PIA. The answers to these and related queries are provided in table 5.6 to draw inference about sustaining the project activities in the sample watershed areas.

Table 5.6: Working of WC and village communities

SL No.	Operation and Maintenance Information	Non-Tribal Dist		Tribal (Dahod) Dist	
		WS-I	WS-II	WS-III	WS-IV
1	Training of WC	Yes	Yes	Yes	Yes
2	User Groups conflict	Yes	Yes	No	Yes
3	% Non-beneficiaries	33	60	0	35
4	% of beneficiaries' participation in village/ WA meetings	48	63	72	90
5	WC/ Village Community being involved in other Development work	N0	No	Yes	Yes
6	Interest of village community in development of forest and wastelands	N0	No	Yes	Yes

[Source: PDI survey- 2001.]

The WCs in all watersheds are trained to implement the project works, and all have done well in this regard, especially when the PIAs are there to supervise and coordinate their work. Whether these WC and the WA would be able to work on their own and take up other development activities in the absence of PIA in their areas would depend on history of community management and their actual involvement in other development activities. In this connection, the hill/ tribal watersheds are much favaurrably placed, as the WC and the WA members in these villages not only have a traditional community management system, but they have also participated, on their own, in other development programmes (protection and development of forest areas) in their villages. In the hill watershed (WS-IV), although group conflicts exist between beneficiaries and non-beneficiaries, the latter are a smaller fraction (35 %), and there is complete unity among the beneficiaries: almost all beneficiaries in this watershed have participated in the WA meetings training programmes. There is no problem whatsoever in the WS-III, where all groups have participated in the proramme, and there are active SHGs and women groups already operational to take advantage of other development programme (SGSY) meant for the group beneficiaries. Thus, we may conclude that the watershed programme can be sustained in the two watersheds of hill/ tribal district, and more so in WS-III. In contrast, in the plain watershed areas, the WC and WA are not as active in the absence of the PIAs, and is unlikely for the WCs in these two watersheds (I and II) to diversify the activities after the project period and attempt a more all round development in their villages.

Also, as we have found out, in all sample watersheds except in one case (WS-III), a large section of villagers consisting mostly of landless have been left out from the development process. Such a trend of omission of the landless and weaker sections would not only perpetuate the conflicts between the haves and have-nots, but it would also come in the way of effective watershed management and sustenance in the long run. In the absence of any non-farm development alternatives for the non-beneficiaries, consisting of landless and women groups in the watershed areas, not only the poverty alleviation objective would remain unfulfilled, but even the maintenance of existing structures would be adversely affected, as the sections left out would have no stake in sustaining the watershed structures and other related assets.

Chapter- 6
RECOMMENDATIONS

Based on our findings from four sample watershed areas in the tribal and non-tribal districts of Gujarat state, we have identified some issues that need attention of the policy makers as well as the project functionaries. The emerging issues and the recommendations are presented in this chapter.

1. In this study, we have found that the watershed development is better implemented in the hill/ tribal areas compared to the plain/ non-tribal areas, because of the history of community management in hill areas. The existing community management systems have been strengthened under the watershed development programme in the form of technical trainings being provided to the community leaders, who can now better execute the development plans and also can handle development funds. The watershed committees formed in the tribal hill areas are in a better position to sustain the project activities, and can independently handle the development activities even when the services of PIAs are not available to them. So, it is advisable that the State / district administration, while selecting the project areas, gives first preference to tribal and hill pockets. The tribal areas are not only rainfed, but these are also inhabited by the poorest of the poor who need priority development attention. So, instead of selecting/ sanctioning watersheds in any area, the state government should be guided by a priority list of areas/ Blocks that need to be taken up under the watershed programme. In this connection, the government needs to prepare a development index for each Block/ Taluka based on the extents of tribal population, wastelands and forest area, and identify the number of Blocks that can be funded in a year from the priority list based on value of their development indices. PIAs may be asked to take up projects in the pre-identified priority Blocks, rather than in any area identified by a PIA.

2. Unlike in the initial years (early 1990s), when proposals for watershed development came essentially from established NGOs, the district administration (DWAC) is now faced with tremendous local political pressure to accommodate many new PIAs without any relevant project background. As a PIA is allowed to take up an area of 500 ha, the total fund entitlement is Rs 20 lakh at the present rate of Rs 4000 per ha, which is quite a big sum for any new agency. In the recent years (since mid-1990s), after the new guidelines are accepted, and NGOs, Panchayats, etc. are allowed to participate in the programme, there have been increasing number of proposals for watershed development from several new PIAs in all districts. In order that political pressures are avoided in the selection PIA, some minimum qualifications and relevant work experience for an eligible PIA should be introduced in the guidelines. The new PIAs selected for the purpose should be advised to take up watershed areas adjacent/ contiguous to a fully developed watershed, where there is demand for such works, and so the community organization would be easier for the new PIAs to manage.

3. We have found in our sample watersheds that although rainfed and water scarce areas have been chosen for the programme, the land areas developed are essentially private croplands. The community land development activities, especially in the plain/ non-tribal district, have hardly received any attention. While about 15-32 % of total project expenditure is incurred on community land development activities in the hill/ tribal district, the same is 0-10 % in the watershed areas of Plain/ non-tribal district. As the target of a PIA is to develop a total area of 500 ha, with no minimum expenditure or area earmarked for community land areas, many of the PIAs opt for the easier (and least expensive) course of developing only the flatter terrain of cropland areas, where quick participation of land owning households is also possible. We have seen that not only such easier private land development options have been adopted, especially in the plain/ non-tribal district, but also a significant proportion of households (40-60 %) representing the landless and non-land beneficiaries are left out from any direct benefit from the watersheds. In order to avoid such problem and minimize the conflict between beneficiaries and non-beneficiaries, a clause should be included in the guidelines indicting a minimum % area and expenditure (30-50 %) that need to be devoted for the development of community land resources and introduction of income generating activities for the landless and other weaker sections.

4. The cost norm for watershed development is not based on land slope or type of land area that need to be developed. In general, a flat rate of Rs 4000 per ha is allowed, and so the PIAs attempt to select a rainfed village having a flatter terrain and having a minimum land area above 500 ha, where the land development works can be cost effectively implemented, even though the village may not be in the top priority list of watershed villages. There is thus a need to review the cost structure and norm, allowing higher per ha cost for the hill areas and community/ forestlands having higher land slopes.

5. The effectiveness of community organization and sustaining the watershed activities depend to a large extent on the composition of the WA. We find that in three of the four sample watersheds the WA consists of only one user group representing the direct land beneficiaries; the indirect land beneficiaries and landless groups, constituting about 40-60 % of total households, remain out of any WA or WC. In such a situation, the WC, which does not represent all user groups and communities, cannot take up other development works and manage development funds meant for the entire village and the poorest in particular. The role of the WDT in this regard is thus important. The WDT is required to rework the development plan prepared by PIA, before commencement of the project activities, to include other (income generating) activities, which would directly benefit the left-out user groups or non-beneficiaries. In the absence of direct flow of benefits to all household groups, all of their participation/ membership in the WA is not possible. In order to achieve this objective, the WDT members, especially the social science experts, need to be further trained. The training topics should include:

- Identification of various user groups
- Assessing the need for each user group
- Finding suitable project activities mostly in the non-farm sector that would provide direct and recurring consumption benefit to all user groups, especially the landless poor and women groups.
- Roles and agreement of all user groups in the management and protection of community land areas.

6. There is a need to diversify the role of WDT to get associated in the post project activities for a minimum period of 2-3 years after the project period to help various user groups in their production and marketing activities. The need for crop demonstration/ diversification is felt only after the project period when the effects of soil-moisture conservation are actually experienced. Similarly, the new activities (dairy, poultry, etc.) introduced during the project period are to be supported with market networking. The WA and WC need professional support in these respects for a few years after the project period, when the PIA withdraws from the area. The WDT could provide such post project professional services. If required, an additional member, a marketing expert, needs to be added to the existing four-member WDT to effectively handle this new responsibility. There is need for inter-departmental coordination to provide technical and marketing supports to the SHGs formed and activated in the project areas.

7. We have found in this study that although there is positive impact of the watershed programmes on crop production and soil/moisture conservation, there is no significant reduction in the gender and income inequality in the project areas, as a large number of non-beneficiaries consisting of landless and women groups have not been provided with suitable development/income alternatives. Can we generalise this finding? We need to have an interstate study in this regard involving analysis of diverse watershed projects implemented by a cross section of PIAs including both government and non-government agencies. This study should specifically pin point the changes from primary activities to secondary activities in a post project scenario with specific reference to participation of landless poor and women groups in such activities. This would enable the authorities to formulate suitable policies for development of the areas.