

**Impact Assessment of Watershed
Programme on Tribal and Other Backward
Communities in Sabarkantha District**

Talukas: Meghraj and Modasa



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C f I D

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FOREWORD

Initiated in 1994, Development Support Centre (DSC) aims at providing knowledge based support to people- centred natural resource development. Its primary focus is on capacity building, research and policy influencing. Through direct implementation of some the programmes such as watershed, participatory irrigation management and productivity enhancement, the organization aims to demonstrate the feasibility of such participatory approaches. This not only gives the organization a hands- on experience of field realities, but also continuously provides critical inputs to its primary interventions.

Since 1999, DSC has been working as a Project Implementation Agency (PIA) for the watershed project of the Integrated Wasteland Development Programme (IWDP) in Meghraj and Modasa Blocks of Sabarkantha district. This programme has four watershed projects across seven villages covering 2055 hectares of land. Funded by the District Rural Development Agency, the project will be completed by March 2007. As an implementing agency, one tends to get too involved in the nitty-gritty of the project and therefore there is a danger of losing sight of the main objectives. As a learning organization, it was therefore important for DSC to assess whether this was the case. It was felt that an independent organization having experience in the field could carry out an impact assessment study of the project and also suggest the scope for future interventions. The Centre for Integrated Development (CfID), an organization that conducts similar studies, was approached and they agreed to carry out the study.

The study points out that while the organization has been able to largely achieve the primary objective of improved livelihood through the watershed management programme, interventions such as animal husbandry and issues related to equity in benefit distribution and gender concerns still need to be adequately addressed. Since strong village institutions such as Self Help Groups (SHGs), Watershed Associations and cluster level Federations for both, men and women have been formed, there is tremendous scope for them in addressing issues related to the overall development of the villages, rather than limiting their intervention to productivity enhancement alone. To derive maximum benefits, DSC could also help these institutions in convergence of various government schemes.

DSC is thankful to all the villagers and DRDA officials who have made a significant contribution towards the success of the programme and hopes that they will continue to provide support during the post-project or watershed plus interventions. Last but not least, the organisation is thankful to CfID for carrying out the study.

Sachin Oza
Executive Director
26.11.06

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Tapan Patel & Tanvi Shah
Centre for Integrated Development (CfID)

Abbreviations

| | |
|--------------|--|
| CBO | Community Based Organization |
| CPR | Common Pool Resource / Common Property Resource |
| DPAP | Drought Prone Area Programme |
| DPP | Desert Development Programme |
| DRDA | District Rural Development Agency |
| IWDP | Integrated Wasteland Development Programme |
| FGD | Focus Group Discussion |
| GOI | Government of India |
| IGA | Income Generation Activity |
| NREGS | National Rural Employment Generation Scheme |
| PHC | Primary Health Centre |
| PIA | Project Implementation Agency |
| PRA | Participatory Rural Appraisal |
| PRI | Panchayati Raj Institutions |
| NGO | Non Government Organization |
| NRM | Natural Resource Management |
| SC | Scheduled Caste |
| SHG | Self Help Group |
| ST | Scheduled Tribe |
| TDO | Taluka Development Office |
| TSC | Total Sanitation Campaign |
| WDA | Appointing Watershed Development Association |
| WDC | Watershed Development Committee |
| WDT | Watershed Development Team |
| WS | Watershed |
| WUA | Water User's Association |

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Executive Summary

Watershed Development in India has been conceived basically as a strategy for protecting the livelihood of the people inhabiting the fragile eco systems experiencing soil erosion and moisture stress. The aim has been to ensure the availability of drinking water, fuel wood and fodder and raise income and employment for farmers and landless labourers through improvement in agricultural productivity and production. From the mid eighties, development of dryland agriculture on a watershed basis has been the national strategy for sustained productivity and rational utilization of natural resources.

Since 1999, DSC has been working as a Project Implementation Agency (PIA) for the watershed project of the Integrated Wasteland Development Programme (IWDP) in Meghraj and Modasa Blocks of Sabarkantha district. This programme has four watershed projects across seven villages covering 2055 hectares of land. This study is an attempt to assess the impact of watershed activities in seven villages of Sabarkantha district. The primary objective is to analyze as to what extent the programme has been able to achieve the objective of improved livelihood through natural resource development. The report also looks into the potential synergies that can be developed between various programmes implemented by the PIA as well as the Panchayat.

A detailed study of all the seven villages of the watershed project was carried out using participatory tools and exercises. Perceptions of district level government officers are also taken into consideration.

Since the primary objective of the IWDP project is on natural resource development through village institutions, the study focused on natural resource development and social development. It was felt that the potential for enterprise development could be examined and suggested as an intervention that could be taken up by DSC in the post project or watershed plus phase. The parameters to assess these functions are:

A. Environmental Parameters

1. Reduced Soil Erosion
2. Recharged groundwater for drinking and irrigation
3. Higher productivity of non-arable land

B. Economic Parameters

1. Rain- fed agriculture productivity
2. Increased irrigation
3. Livestock improvement
4. General development
5. Employment creation (directly or indirectly)

C. Social Parameters

1. Skewed benefits to the poor and marginalized
2. Promotion of collective action/ Institutional building
3. Awareness generation

Major findings of the study are as follows:

1. There is a 10-15% increase in irrigable land. This is mainly due to increase in the bore wells in the region due to stabilized ground water and increase in household income of small and marginal farmers. Increase in bore wells however indicate ground water exploitation and care should be taken to recharge ground water wherever possible.
2. There is increase in cultivable land with adoption of new seeds, technology, use of wastelands and available credit.
3. Watershed activities are widely acknowledged by people and they are sure of getting better results in coming years. There have been encouraging individual initiatives to promote good agricultural practices. Activities of federation and its helpfulness is also acknowledged widely.
4. There has been significant awareness generation on better agriculture practices, government schemes, rights and responsibilities of community and panchayat and

overall development issues. This can be attributed largely to exposure visits, trainings and awareness programmes conducted by PIA in the watershed programme. However the programme has not been successful in initiating pressure groups for working in the interest of overall development of the community.

5. Institutions made in watershed programmes need further support for a couple of years in terms of capacity building and market linkages, to make them sustainable and self-motivated. Also, the SHGs need to be linked with some income generation activities, without which they will lose the momentum for development.
6. In most of the project villages the landless form about 5% of the total population. However their benefit from the watershed programme is limited to receiving short term employment. Some of the families are in the User Groups, but they have limited stake in decision making and expressing their opinion.
7. Status of women has gained a respectable position in society and family and their opinion and decision in family matters is considered. Income generation and savings, credit through SHG have improved health and education conditions and also helped families in times of crises. Also, the bonding amongst the members through SHGs has worked as an impetus for larger social actions. Women in SHG feel more confident to interact with people, officers, panchayat, bank and doctors. Although, there have been encouraging results of SHGs and exposure visits, the role of women in managing, decision making and monitoring of physical activities of watershed programme has been very limited and insignificant in some villages. Women do participate in labour work, but do not have their say in important matters of watershed.

Overall there has been a positive impact on existing livelihood patterns of tribal and other communities. Household income has increased vis- a -vis their expenditure and purchasing capacity. Stress migration is checked significantly in the last couple of years. The pattern of expenditure in a family has also seen a positive change. Some years ago, the major part of their income was spent in debt repayment and purchase of basic food items (maize flour, pulses, oil, onion). Now they are spending on investments in agriculture, health, education and supplementary food items like ghee, vegetables, *bajra* flour, rice etc.

DSC's programme is widely acknowledged and appreciated for strong technical and skilled staff, which is the key to effective planning and implementation, but simultaneously there have been some factors which have disabled the programmes in varying capacities. Most of the disabling factors point to high turn over of field staff as a result of inadequate facilities in such undulating topography.

However there are several limitations to the overall impact proposed to be achieved by this programme. Some factors are external, which some can be attributed to the overall approach of the organization. External factors like dry consecutive years and excessive rainfall this year is one of the factors due to which the watershed interventions have not been able to achieve the desired results.

There are some programmatic limitations which draw attention:

- Watershed activities have not significantly improved the conditions of poor and landless. Apart from some small-time labour work in the activities of WSD, there has not been done much to improve their livelihood. There are instances of poor families migrating in search of work in a couple of villages.
- Not much work is done on the livestock improvement. Villagers need more support on livestock management as an alternative Income Generation Alternative (IGA).

Development programmes cannot work effectively in watertight compartments. Integration of various development programmes to suit the needs of the region works out the best for the particular region. In the project area of Meghraj and Modasa too, there is tremendous

potential to tap the opportunities for comprehensive development of the region. Potential synergies can be developed, considering the following points.

- Convergence of other resources to reduce the financial constraints for effective implementation of the watershed programme. Looking at watershed programme beyond the government scheme, as a vehicle for comprehensive social and economic development.
- Need to focus on drinking water availability and work closely with community to avail of benefits of the Swajaldhara programme.
- Link SHGs with income generation activities. It will be difficult for SHGs to keep up their motivation, if it is only for savings. Income generation activities will enhance their capabilities, motivate them and bind them together for common interest.
- Helping Panchayat and TDO in identifying the projects for NREGS to benefit the project villages (with focus on marginal and poor families). Most of the works done under Government's relief measures do not contribute significantly to sustained development of villages. Innovative approach and projects will not only increase employment opportunity but also contribute in development. (e.g. road to Modersumba, employment in watershed activity, pastureland/wasteland development, construction of sanitation units under TSC etc). This can be done with private participation to create more employment. (e.g. materials for construction of community hall can be contributed by community and labour work can be done under NREGS).
- There is scope of improvement to market access and information to the villagers and also to the stakeholders market to make them understand the pattern of products and investments, which may be mutually beneficial to farmers as well as the market stakeholders. Federation is actively involved in bridging this gap and has a greater role to play in the interest of farmers in the future.
- Creating more opportunities of livelihood through on-farm and non-farm based activities can be taken up. Cattle rearing, agri-insurance, food processing units, marketing etc. can be new and promising avenues for institutions and individuals in the region.
- Federation, SHGs and other institutions can be motivated to take up general development issues and can be trained to use acts like RTI and NREGS for their interest. These institutions can work as effective pressure groups for development of the region.
- As there has been significant increase in the number of borewells in the region, additional activities (apart from watersheds) should be encouraged to recharge ground water wherever possible.

1.1 Introduction to Watershed Programme

¹ A Watershed is a geohydrological unit, draining at a common point by a system of streams. Essentially, a watershed is all the land and water area, which contributes the run-off to a common point. It is a land area that captures rainfall and conveys the overland flow and run-off to an outlet in the main flow channel. However, a watershed is much more complex. In fact, it watershed is a biological, physical, economic and social system. It is also a land mass bounded vertically by the area influenced by human activities, and horizontally by the water that drains into a point in the channel. Within this area, we have a system consisting of a number of very dynamic and interrelated physical, social and economic factors (Lopez and Hernandez, 1972).

The size of the watershed may vary from a few square meters to thousands of square kilometers. The size becomes important, depending upon the objective . For example, for large irrigation projects, watersheds of thousands of square kilometers may be considered; while for small storage structures in farms, a few hectares would suffice is also affected by afforestation, grassland development, cultivation etc. A number of physiographic features like valleys, undulating hillocks and rugged hilly tracts influence the size. Larger watersheds could be selected in the plains where afforestation and grassland development is the main objective. In the hilly areas where agriculture development is the main objective, smaller ones are chosen. On an average, 5000 ha of milli watershed is an effective unit of watershed management and 500 ha of micro watershed is functional watershed development unit.

A watershed has a wide -ranging effect on the lives of the people at large. Soil, water and vegetation are the most vital natural resources and it affects them all. The sustained productivity of food, fuel, fodder, forage, fibre, fruit and small timber can be ensured by judicious and effective management of soil, water and vegetation.

Watershed management may thus be defined as the process of formulating and carrying out a course of action involving manipulation of its natural, agricultural and human resources to provide those desired by and suitable to watershed community, but under the condition that soil and water resources are not adversely affected.

¹ Rajesh Rajora (2001), Integrated Watershed Management – A field manual for equitable, productive and sustainable Development

1.2 Watershed Programmes in India

Watershed Development in India has been conceived basically as a strategy for protecting the livelihood of the people inhabiting the fragile eco systems experiencing soil erosion and moisture stress. The aim has been to ensure the availability of drinking water, fuel wood and fodder and raise income and employment for farmers and landless labourers through improvements in agricultural productivity and production. From mid eighties, development of dryland agriculture on the watershed basis has been the national strategy for sustained productivity and rational utilization of natural resources.

The extent of degraded wastelands (including degraded forest lands) in the country is in order of 175 million hectares. The development of wastelands is an important weapon in the country's war against poverty. Watershed development has tremendous potential to render socio-economic justice, attain self-reliance and usher in balanced development. Out of 175 million hectares of degraded wasteland, even if 120 million hectares were made productive, it would generate employment to about 30 million families. With an average income of Rs. 10,000 per hectare, the national income could go up by Rs. 120,000 crores every year. The new assets could further generate self employment opportunities to nearly an equal number of families, through various small scale and cottage industries based on agro forest produce and service sector.

Watershed Development Projects have been taken up under different programmes launched by the Government of India. The Drought Prone Area Programme (DPAP) and the Desert Development Programme (DDP) adopted the watershed approach in 1987. The Integrated Wasteland Development Programme (IWDP) schemes taken up by the National Wasteland Development Board in 1989 also aimed at developing wastelands on a watershed basis. This programme has now been brought under the administrative jurisdiction of the Department of Wasteland Development in the Ministry of Rural Development. The fourth major programme based on watershed concept is the National Watershed Development Programme in Rainfed Areas (NWDPA) under the Ministry of Agriculture.

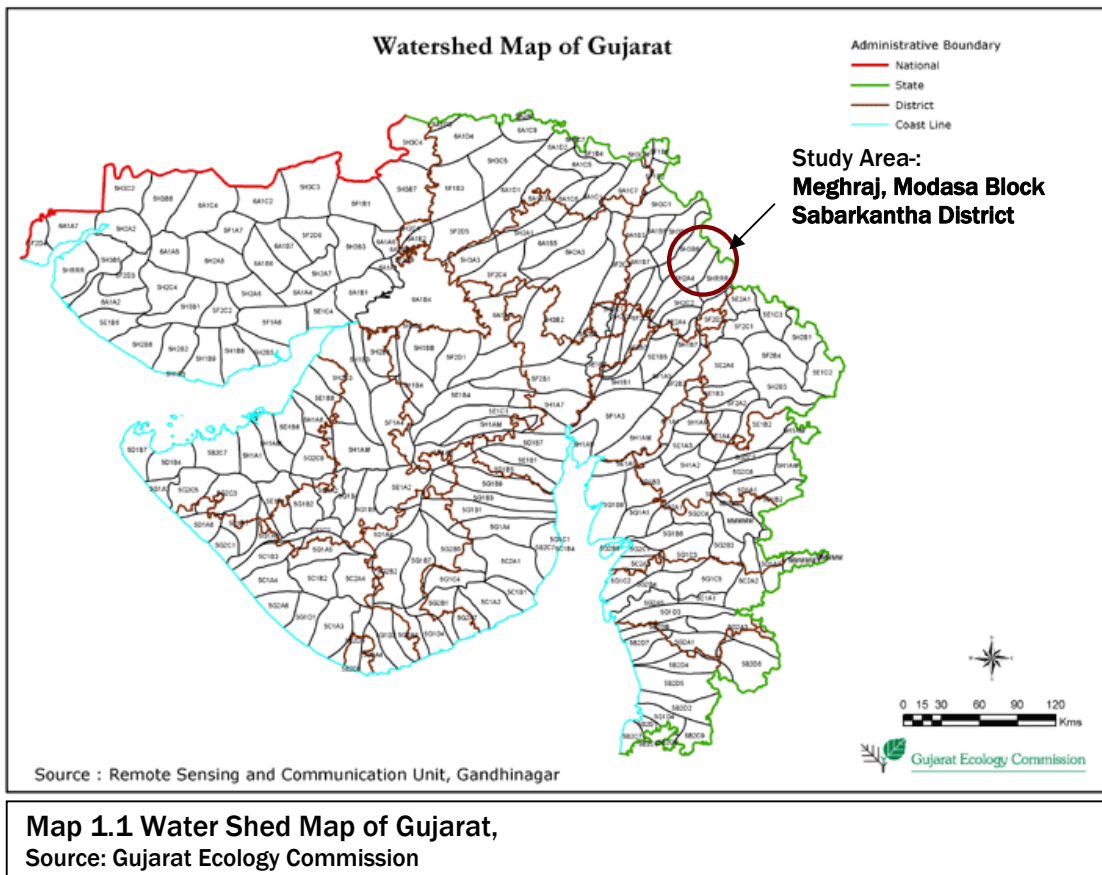
Most of the watershed projects (about 6000) under the new guidelines have been taken up for implementation since 1995-96 under the DPAP. These projects are significantly implemented in 11 states viz. A.P, Bihar, Gujarat, Karnataka, Maharashtra, Orissa, Rajasthan, Tamilnadu, U.P and W.B.

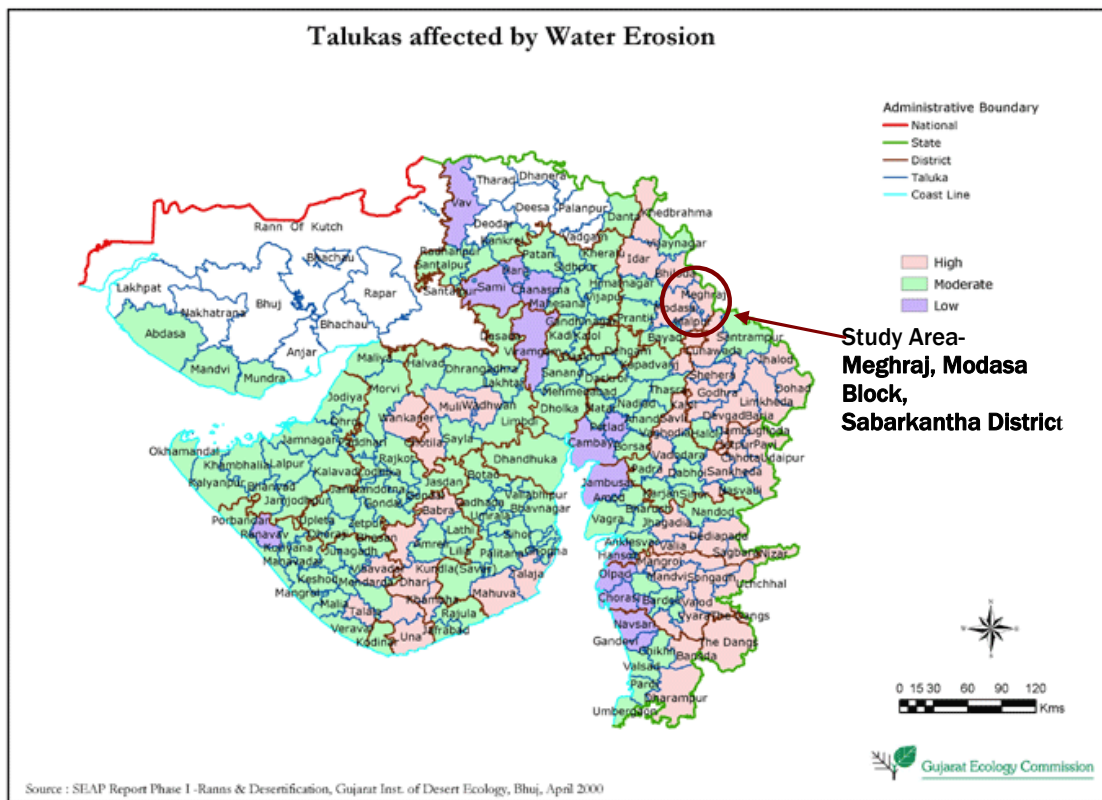
1.3 Watershed Programmes in Gujarat

Gujarat has a diverse geo climatic conditions. Under IWDP, the total area treated under watersheds in Gujarat from 1998 to 2004, is about 262,357 Ha. Similarly, Hariyali programme covers approximately 19,000 ha from 2003 to 2006. Also, watershed projects are covered under DPAP and DDP programmes in Gujarat. These projects are implemented in almost all the districts with varying coverage.

The target of IWDP in Sabarkantha district was 12,000 hectares, which means about 24 watershed projects. The project study area of Meghraj and Modasa Talukas of Sabarkantha district comes under a semi humid, arid area with high level of water erosion (refer map 1.2). It is the area of central hills near Aravallis with slopes varying from 2% to 15%. Due to high level of water erosion here, watershed projects would be help check soil and water erosion, stabilize soils, regenerate ground water and enhance productivity of land. The watershed project in Sabarkantha were commenced in 1998 with DRDA as the principal implementing agency, but 13% of the funds are still unspent due to various reasons.

Maps 1.1 and 1.2 depicts watersheds in Gujarat and Water Erosion levels in Gujarat respectively; showing the study area (encircled).





Map 1.2 Talukas of Gujarat Affected by Water Erosion

Source: Gujarat Ecology Commission

2.1 Background

The Development Support Centre (DSC) mainly works for Participatory Watershed Management and Participatory Irrigation Management since its inception in 1994. It has been working as the Project Implementation Agency in Meghraj and Modasa Block of Sabarkantha district for watershed development, since 1999. This programme has four watershed projects across seven villages covering approximately 2055 ha of land.

2.2 Rationale of Study

Participatory approach and capacity building of the community is a vital and essential part of the programme implemented by DSC. The approach and processes adopted have played a key role in success or failure of the projects. It is thus essential to measure the extent of impact of the whole programme implemented by DSC to analyze the aptness of the approaches and processes adopted by DSC in the project area.

2.3 Objectives

This study is an attempt to assess the impact of watershed activities in seven villages of Sabarkantha district and tries to meet the following primary objective set for this study:

1. To what extent the programme has been able to achieve the objective of improved livelihood through natural resource development

The following are secondary objectives of the study

1. To find out the approaches to watershed development those have worked best to achieve the primary objective of livelihood enhancement.
2. To study the institution building process in the watersheds and potential of convergence of programmes like *Swajaldhara*, *Swa Shakti* and others; for sustainability.

2.4 Methodologies and Scope

- A study has been carried out in all the seven villages covered by DSC. Participatory Rural Appraisal (PRA), Focus Group Discussion (FGD), interviews and case studies are the main tools used for assessment.
- The study focuses on qualitative aspects of the programmes such as approach and process adopted by the NGO, community empowerment and asset building, leadership quality developed, quality of participation by community base institutions.
- The study also looks in to the factors that contributed to success or failure of the efforts, such as contribution by villagers in terms of labour and cash, effect on private investments in NRM etc.

- Through focused group discussions, the study enquires upon the future plans of institutions and women groups, their vision and role in development, identifying the gaps and critical support needed by institutions.
- Perceptions of district level government officers are also be taken into consideration.
- Quantitative data has been used to determine the coverage and economic gains from the programme.

2.5 Sequencing of Study

1. Literature study: Through secondary data, baseline data, project reports, interaction with NGO staff
2. Preliminary visit: To get first hand information about the project, coverage etc to design framework for the field study
3. Field study: Interaction with community, user groups, SHGs, women, associations, and federations. Assessment by FGDs, PRA, participatory tools, site visits, interaction with government officials
4. Analysis and documentation

2.6 Frame work of analysis

Table 2.1 Framework of Analysis for the Study

| S.No. | Parameters for assessing impact | Indicators | Assessment Method |
|-------------------------------------|---|---|---------------------|
| Ecological and Environmental | | | |
| 1 | Reduced soil erosion | No. of structures and coverage and beneficiaries | PRA |
| 2 | Recharged groundwater for drinking and irrigation | Rising water level, increase in irrigated land, seasonal change in availability of water, access to safe drinking water | FGD, PRA |
| 3 | Higher productivity of non arable lands | No. of tree plantation and increase in green cover, pastureland development, Increase in cultivable land | PRA, case study |
| Economic | | | |
| 4 | Rain fed agriculture productivity | Increase in cultivable land, increased productivity per acre of land, change in crop pattern, increased yield | FGD, PRA Case study |
| 5 | Increased irrigation | Increase in irrigated land, water availability for irrigation, increase in yield of crops, crop change | FGD, PRA Case study |

| | | | |
|---------------|--|--|--|
| 6 | Livestock improvement | No of vet camps, increase in yields, increase in no. of cattle and families depended on cattle rearing | PRA, FGD, Interviews |
| 7 | General development | Increase in assets and improvement of basic service delivery and infrastructure | PRA, FGD |
| 8 | Employment creation (directly or indirectly) | Increased wages, income, employment | FGD, case study/ interviews |
| Social | | | |
| 9 | Skewed benefits to poor and marginalized | Increased wages, income, employment, change in migration pattern | Case study |
| 10 | Promotion of collective action/ Institutional building | No. of institutions (WUA, SHG), performance indicators like transparency, accountability, empowerment No. of meetings, regularity and contribution Training programmes and no. of participants | Instances of collectives actions, case studies, Institutional analysis by participatory exercise |
| 11 | Awareness generation | People's perception, govt officers' perception, vision of institutions, involvement of PRIs. | Interaction, interviews |

Determinants like agro climatic conditions, socio economic conditions, access to market, infrastructure etc are also considered in impact assessment.

2.7 Participative Consultations for Information Collection

The study was carried out in seven villages of four watershed projects. Out of seven villages, five fall in Meghraj taluka while two are in Modasa taluka. As mentioned above participative consultations were adopted for information and data collection. The list of various exercises undertaken are as given below:

Table 2.2 List of exercises for information and data collection

| S.No. | Village | Tool | Participants |
|-------|---------|----------------------------|--------------|
| 1 | Valuna | PRA – Resource Mapping | 15 |
| 2 | Valuna | FGD- SHG | 18 |
| 3 | Valuna | FGD- WS Committee & others | 9 |
| 4 | Valuna | Transect | 5 |

| | | | |
|----|------------|---|----|
| 5 | Bhatkota | FGD- SHG | 20 |
| 6 | Bhatkota | Interview with Marginal farmer | 4 |
| 7 | Bhatkota | FGD- WS committee members and others | 8 |
| 8 | Bhatkota | Transect | 5 |
| 9 | Vaniawada | Interview- Marginal farmer and member of WS committee | 6 |
| 10 | Vaniawada | Interview with marginal farmer and a landless labour | 4 |
| 11 | Vaniawada | Transect | 4 |
| 12 | Modersumba | PRA- Resource Map | 14 |
| 13 | Modersumba | Interview with marginal farmer | 2 |
| 14 | Modersumba | FGD- WS committee members and others | 7 |
| 15 | Modersumba | FGD- SHG | 12 |
| 16 | Modersumba | Transect | 6 |
| 17 | Gokchuvan | Interview with marginal farmer | 3 |
| 18 | Gokchuvan | Discussion with WS committee secretary and members | 4 |
| 19 | Gokchuvan | Discussion with SHG members | 3 |
| 20 | Gokchuvan | Transect | 6 |
| 21 | Tarakvadia | Interview with WS committee member | 6 |
| 22 | Tarakvadia | Interview with SHG members | 3 |
| 23 | Tarakvadia | Transect | 5 |
| 24 | Dholvani | Interaction with marginal farmer | 3 |

3.1 About DSC as the Project Implementation Agency:

Development Support Centre supports the organizations, programmes and policies of people- centric development through Natural Resource Development. DSC was initiated in April 1994 and currently works on two focus areas; Participatory Watershed Programme and Participatory Irrigation Management. The major activities through these programmes are:

- **Training**

Training, workshops, exposure visits on participatory rural appraisals and technical subjects (such as design of water harvesting structures) and research programmes for organisations working in natural resource development and management. Watershed Development Teams (WDTs), NGOs, CBOs and members of DRDA are the target groups for such trainings.

- **Field Services**

Support to more than 10 organisations for long-term programmes. Support and motivation to WDTs in all the watershed activities promoted by these organizations. DSC also helps organisations in formation of WDTs, site selection for water harvesting structures and construction of these structures.

- **Implementation**

To lead the path for the organizations which are supported by DSC, it implements the programmes of watershed and PIM in Dhari (Amreli) and Meghraj-Modasa (Sabarkantha) blocks, working as the Project implementation Agency (PIA).

- **Policy level advocacy**

DSC is member of eight district level watershed Advisory Committees in Gujarat and representative in various committees at the state and national levels. It strives to constantly improve the process of people centric development through experience sharing with the Government and other implementing agencies through workshops, exposure visits, seminars and meetings.

- **Information dissemination**

DSC documents the best practices adopted in watershed management and other natural resource development and publishes them in the form of books, documents, video etc. It also has a library containing significant information, research and documents on relevant subjects.

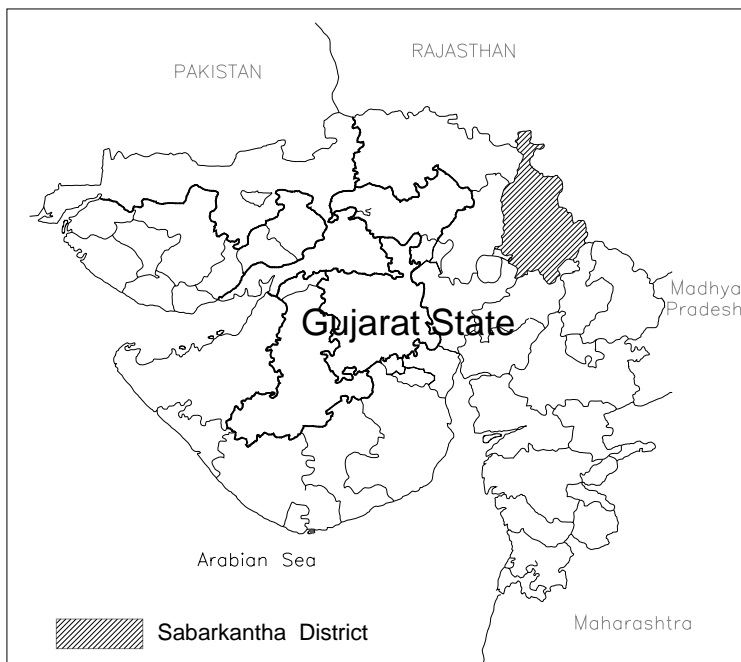
- **Research**

DSC carries out research in allied fields and based on that, works for policy level amendments.

3.2 Project Area Profile

3.2.1 District Level Information

Sabarkantha district falls on the north-eastern boundary of Gujarat, adjoining South Rajasthan and west Madhya Pradesh, between 23°30'N and 24°34' N latitude and 72°10'E and 73°36' E Longitude. The total population of the district, as per the 1991 census, was around 17 lakhs which formed 4.26% of state's population. In 2001, the population of district was 2,0834,16, which is about 4% of state's population. The population of Schedule Caste in 2001 in



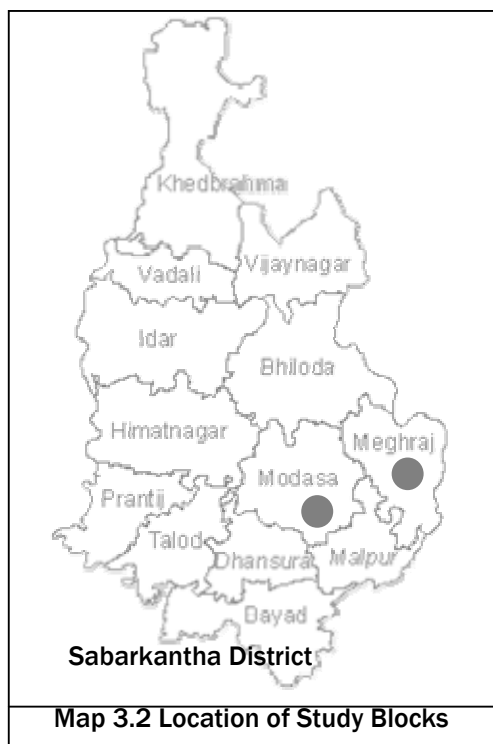
Map 3.1 Location of Sabarkantha District in Gujarat

Sabarkantha was 8.3% of the total population, which is higher than the state average of 7.1%. Similarly population of Scheduled Tribe was 20.2% compared to State's 14.18%. The growth rate of population in the district from 1991-2001 was 23.91. the total area of district is 7390 Sq km. Sabarkantha has 13 blocks, 1390 villages and 8 towns. There are 650 villages above 5000 population. Sabarkantha is the only district of Gujarat which has 65% of its land designated as rain fed and wasteland. Forest cover in the district is about 16%. It falls under agro climatic zone IV with average annual rainfall 750-1000 mm.

3.2.2 Block Level Information

Demographics and Socio-economic Conditions

The study area is one of the backward parts of the district. Meghraj block is specifically backward area with major population of adivasis and weak socio- economic conditions.



Map 3.2 Location of Study Blocks

The proportion of population of schedules caste and schedule tribes to the total population in Meghraj block is 3.4% and 36.4% respectively. The ST population in Meghraj is specifically high, as compared to Sabarkantha district and the state. Modasa

is fast urbanizing Blocks in the district. However, the villages under the study area lie at the border of Meghraj block and are highly backward as compared to the Block. Table 3.1 compares the demographic and socio- economic aspects of both Blocks and Sabarkantha District in comparison to Gujarat State. The region has more SC and ST population which are economically and social backward compared to other regions. Per capita income is also less than the state average, which is also one of the main reasons for neglected development in this area. Literacy rate in Meghraj is far less, as compared to Sabarkantha District and Gujarat State.

Table 3.1 Comparison of Demographic and Socio-economic conditions of study blocks with Sabarkantha District and Gujarat State.

| | Gujarat State | Sabar kantha District | Meghraj Block | | | Modasa Block | | |
|---|---------------|-----------------------|---------------|-----------|----------|--------------|-----------|----------|
| | | | | % to Guj. | % to SBK | | % to Guj. | % to SBK |
| Population | 50671017 | 2083416 | 141802 | 0.28 | 6.81 | 191606 | 0.38 | 9.20 |
| % of SC to total pop. | 7.1 | 8.3 | 3.8 | 0.15 | 3.12 | 9.1 | 0.48 | 10.08 |
| % of ST to total pop. | 14.18 | 20.2 | 36.4 | 0.72 | 12.26 | 3.1 | 0.08 | 1.1 |
| Sex Ratio | 920 | 948 | 965 | | | 942 | | |
| Decadal Growth Rate | 22.96 | 18.3 | 23.94 | | | 16.51 | | |
| Urbanization | 37.4 | 10.89 | 6.98 | | | 28.21 | | |
| Literacy % | 69.1 | 67.32 | 58.44 | 0.24 | 5.91 | 72.63 | 0.4 | 9.92 |
| Source: Gujarat Census 2001. | | | | | | | | |
| Note: SBK indicates Sabarkantha, Guj. Indicates Gujarat | | | | | | | | |

Climate

The project area is located between 23°33'N and 24°30' N latitudes and 72°43'E and 73°39' E longitudes. The temperature remains between 15°C to 30°C in winters, while it goes up to 40°C in summers. The annual rainfall ranges between 500 –1000 mm. There is a drought situation every four years in this region. (See Annexure for Annual rainfall of Sabarkantha District for last fifteen years)

Soil Conditions

Both the talukas are semi arid areas with undulating geography. The soil is black, silty, rocky and sandy loam in different parts of the project area. The part of Sabarkantha which adjoins border with Rajasthan has hilly terrain with rock formation. This area is mainly inhabited by tribal population. The land has 5-10% of slope and due to rock formation, the water retaining capacity of the soil is less.

Agriculture and allied activities

Most of families in the project area own land and thus, agriculture is the primary occupation here. Generally, two crops are taken in a year- monsoon and winter. Due to scarcity of water and scanty rainfall, it is not possible to take any crops in summers

except grass grown for fodder. The main crops of the region are corn, paddy, *bajri*, wheat, *tuver*, mustard etc.

The secondary occupation of the people here is cattle rearing. Most of the families have goats, sheep, cows and buffalos in the village, but the yield is used for household needs. There is no major income from cattle yield, except from some of the dairy cooperatives formed in some villages. Also the awareness on increasing yield and cattle care is low among the villagers.

Other occupations

Improvement in education awareness has benefited the tribal population. Now, people are employed in government jobs as teachers, clerks, police and others. Moreover, many are also engaged in small time income generating occupations, such as mason work, carpentry, black smiths, tailoring, grocery shop, etc.

Drinking water

Most of the villages have hand pumps for drinking water. The ground water was 70-80 feet deep in the 1990s, which has now gone to 200 feet. Many hand pumps are non functional and many others have been deepened. There is no piped water supply in this area.

Irrigation

Farmers use open wells and bore wells for irrigation. Over the years, there has been a sharp decline in ground water table and thus, bore wells have increased, while the use of open wells is rapidly decreasing. There is no facility of canal work for irrigation.

Major Issues in the Project Area

- Most of the land has rocky formation, silt and sandy soils. Thus, agriculture produce is less.
- There has been rapid deforestation, leading to major land erosion problems. Deep trenches and crevices in the land can be seen at most of the places.
- Rainwater is not retained and harvested, leading to scarcity of water in summers.
- Deforestation has also lead to scarcity of fuel wood.
- Social evils, derogatory customs and superstitions still prevail among the villagers of this area.
- There has been limited development of infrastructure, such as road transportation, health amenities, and markets.
- Some of the villages face acute shortage of drinking water in summers.
- Most of the agriculture here is rain fed and thus, it is possible to take only one good crop in a year.
- There is widespread addiction to alcohol and tobacco..

Purpose of Water Shed Programme in study area

DSC has worked as a Project Implementation Agency in four watersheds across seven villages of Meghraj and Modasa block of Sabarkantha district. Major population in all these villages is Scheduled Caste and Scheduled Tribes. The area is semi arid with undulating geography. The primary objectives of watershed programme here are:

1. Livelihood augmentation and income generation through optimum natural resource development (land, water and vegetation) and enhancing savings in the villages that are directly or indirectly dependent on the watershed area.
2. Environment and ecological stability and rehabilitation in the project area.
3. Enhance economic and social condition of poor, marginal, landless labours with special focus on women, through institutional strengthening like SHG formation and others.

The Secondary Objectives of the watershed programme envisaged are:

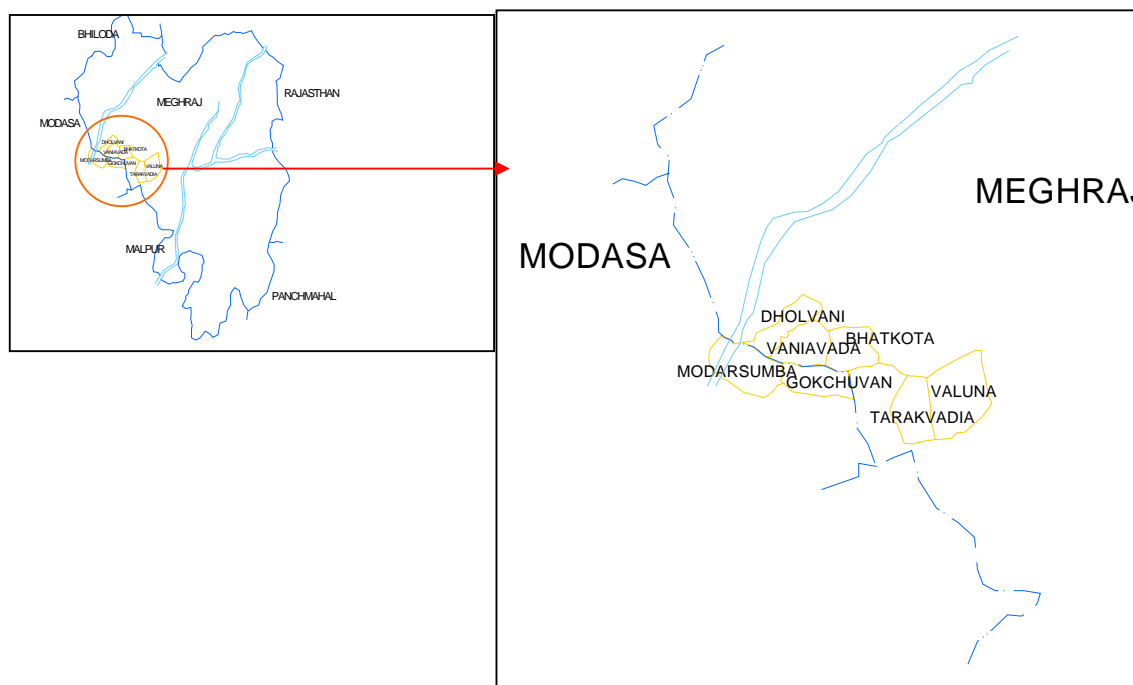
- Increase in drinking water
- Increase in irrigated area and cultivable land
- Increase in trees and grass leading to decrease in fodder scarcity
- Improvement in cattle rearing and consequently milk production
- Increase in livelihood opportunities
- Increase in employment rate and employment days
- Development of savings activities through women self help groups leading to self dependence of women
- Collection of village fund for other activities, and maintenance of other works
- Increase in leadership qualities specifically in women, partnerships and community participation
- Adoption of equity amongst community
- Increase in linkages with government agriculture banks, co-operatives.

3.2.3 Village level information of project area

DSC works in four watershed areas in Meghraj and Modasa covering more than 2000 ha across seven villages. Details of the villages covered in the programme are given below:

Table 3.2 List of Villages Covered under various Watershed Projects by DSC

| Watershed Project | Village | Block |
|-------------------|------------|---------|
| 1 | Valuna | Meghraj |
| 2 | Modersumba | Modasa |
| 3 | Bhatkota | Meghraj |
| | Vaniyawada | Meghraj |
| | Tarakvadia | Meghraj |
| 4 | Gokchuvan | Modasa |
| | Dholvani | Modasa |



Map 3.3 Location of Study Villages in Meghraj and Modasa blocks

A. Brief Introduction of Villages

1. Valuna

Valuna village is spread across 503 hectares with a total population of 1070. It comprises 8-10 *Falias* with about 141 families. The major population in the village consists of *Adivasis*, *Thakors* and *Harijans*.

2. Modersumba

Modersumba village is spread across 464 hectares with a total population of 921. It comprises of 3 *Falias* with about 141 families. The major population in the village consists of *Patels*, *Darbars*, *Vadis* and *Adivasis*. The village is divided in two divisions with the river Mazum flowing in between.

3. Bhatkota

Bhatkota village is spread across 197 hectares with a total population of 664. It comprises 9 *Falias* with about 96 families. The major population in the village consists of *Adivasis*.

4. Vaniyawada

Vaniyawada village is spread across 208 hectares with a total population of 772. It comprises about 107 families. The major population in the village consists of *Adivasis* and few *Koli Patels*

5. Tarakvadia

Tarakvadia village is spread across 213 hectares with a total population of 463. It comprises 3 *Falias* with about 51 families. The major population in the village consists of *Thakors* and a few of *Luhars*, *Harijans* and *Adivasis*.

6. Gokchuvan

Gokchuvan village is spread across 277 hectares with a total population of 491. It comprises 11 *Falias* with about 71 families. The major population in the village consists of *Patel* and *Darbars*. The village is located at the bank of a river Majum

7. Dholvani

Dholvani village is spread across 193 hectares with a total population of 172. It comprises of 5 *Falias* with about 40 families. The major population in the village comprises *Patel* and *Rabaris* and few *Adivasis*. The village is located at far end of block Modasa .

B. Demographic Details of Villages

Table 3.3 Comparative Population in 1991 and 2001 of the Study Villages (Census data)

| Villages | Area (Ha) | Population (1991) | Population (2001) | Decadal Population Growth |
|--------------|-------------|-------------------|-------------------|---------------------------|
| Valuna | 503 | 779 | 1070 | 37.4 |
| Modersumba | 464 | 781 | 921 | 17.9 |
| Bhatkota | 197 | 505 | 664 | 31.5 |
| Vaniyavada | 208 | 711 | 772 | 8.6 |
| Tarakvadiya | 213 | 322 | 463 | 43.8 |
| Gokchuvan | 277 | 373 | 491 | 31.6 |
| Dholvani | 193 | 141 | 172 | 22.0 |
| Total | 2055 | 3612 | 4553 | |

Table 3.4 Literacy Proportion in Study Villages as per 1991 and 2001(Census data)

| Village | Literacy as per 1991 | | | Literacy as per 2001 | | |
|----------------|-----------------------|----------------------|------------------------|-----------------------|----------------------|------------------------|
| | % of total population | % of literacy in men | % of literacy in women | % of total population | % of literacy in men | % of literacy in women |
| Valuna | 33.37 | 47.30 | 19.49 | 54.30 | 69.06 | 38.33 |
| Modersumba | 49.039 | 59.95 | 37.47 | 52.01 | 63.28 | 40.61 |
| Bhatkota | 48.11 | 62.60 | 33.47 | 59.04 | 70.00 | 47.53 |
| Vaniyavada | 44.72 | 61.45 | 28.96 | 48.45 | 57.18 | 40.45 |
| Tarakvadiya | 27.63 | 44.63 | 6.90 | 45.57 | 60.49 | 29.09 |
| Gokchuvan | 57.10 | 74.75 | 37.14 | 65.17 | 76.69 | 51.56 |
| Dholvani | 63.12 | 71.25 | 52.46 | 70.35 | 79.78 | 60.24 |
| Average | 44.15 | 58.54 | 29.15 | 54.43 | 66.55 | 41.76 |

Table 3.5 Caste Segregation of Study Villages as per year 1991(Census data)

| Village | Total Population | SC Population | ST Population | Total SC+ST | % of Total population |
|------------|------------------|---------------|---------------|-------------|-----------------------|
| Valuna | 779 | 100 | 165 | 265 | 34.02 |
| Modarsumba | 781 | 0 | 181 | 181 | 23.18 |
| Bhatkota | 505 | 0 | 502 | 502 | 99.41 |
| Vaniawada | 711 | 1 | 342 | 343 | 48.24 |
| Tarakvadia | 322 | 4 | 10 | 14 | 4.35 |
| Gokchuvan | 373 | 1 | 7 | 15 | 4.02 |
| Dholvani | 141 | 0 | 22 | 22 | 15.60 |

Table 3.6 Caste Segregation of Study Villages in year 2001(Census data)

| Village | Total Population | SC Population | ST Population | Total SC+ST | % of Total population |
|------------|------------------|---------------|---------------|-------------|-----------------------|
| Valuna | 1070 | 115 | 356 | 471 | 44.02 |
| Modarsumba | 921 | 0 | 311 | 311 | 33.77 |
| Bhatkota | 664 | 0 | 659 | 659 | 99.25 |
| Vaniawada | 772 | 0 | 772 | 772 | 100.00 |
| Tarakvadia | 463 | 3 | 0 | 3 | 0.65 |
| Gokchuvan | 491 | 0 | 3 | 3 | 0.61 |
| Dholvani | 172 | 0 | 24 | 24 | 13.95 |

C. Major Occupations

Major Occupation of the community in these villages is Agriculture on own land and Cattle Rearing. Few families are involved in small-scale business and work as agricultural labour and in services, specifically in government departments. Very few people undertake handicraft or other artisan works.

Table 3.7 Occupational Details of Study Villages

| Village | Families involved in various occupations | | | | | | |
|------------|--|----------------|----------|---------------------|--------------|------------|---|
| | Agriculture | Cattle Rearing | Business | Agricultural Labour | Job/ service | Handicraft | Artisans like carpenters, tailors, masons etc |
| Valuna | 46 | 46 | 1 | 15 | 1 | 2 | 16 |
| Modarsumba | 130 | 130 | | 7 | 1 | | 5 |
| Bhatkota | 72 | 72 | 3 | 20 | 42 | 8 | |
| Vaniawada | 106 | 106 | | 20 | 32 | 16 | |
| Tarakvadia | 48 | 48 | 5 | 15 | 2 | 1 | |
| Gokchuvan | 60 | 60 | 7 | 45 | | 10 | |
| Dholvani | 40 | 40 | | 25 | 3 | 7 | |

D. Land and Agriculture

Table 3.8 Land and Agriculture Details of Study Villages (data as PRA 1999)

| Village | Land type | Land owned by farmers (no. of families) | | | Type of Seasonal Irrigation | | | Major Crops Grown |
|---|--|--|------------------------|-------------------|-----------------------------|----------|---------|---|
| | | Marginal (upto 0.25 acres) | Small (2.5-5 acres) | Big (>5 acres) | Monsoon | Winter | Summer | |
| Valuna | Red Soft rock, sandy loam | 102 | 27 | 11 | 395 Ha I | 25 Ha I | 10 Ha I | Maize, Udad, Tuver, Castor, Cotton, Wheat, Mustard |
| Modersumba | Red soft rock and murrum/ loamy, Slope | 42 | 73 | 15 | 328 Ha NI | 312 ha I | 13 Ha I | Maize, Tuver, Wheat, Raydo, Fodder |
| Bhatkota | Red Soft rock, slope | 35 | 44 | 3 | 150 Ha NI | 65 ha I | 4 Ha I | Cotton. Maize. Tuver, Wheat, Raydo, Mung, Groundnut |
| Vaniawada | Red and Medium Black and Sandy | 31 | 68 | 45 | 177 Ha NI | 35 ha I | 0 Ha I | Maize, Tuver, Cotton, Wheat, Raydo |
| Tarakvadia | Red and Medium Black and Sandy | 22 | 21 | 5 | 205 Ha I | 181 ha I | 55 Ha I | Maize. Tuver, Wheat, Raydo |
| Gokchuvan | Red Soft rock, slope | 44 | 39 | 8 | 255 Ha NI | 75ha I | 5 Ha I | Cotton, Maize, Tuver, Wheat, Raydo, Castor |
| Dholvani | Red Soft rock, slope | 25 | 20 | 5 | 82 Ha NI | 108 ha I | 8 Ha I | Maize, Castor, Tuver, Wheat, Raydo, Mung |
| I indicates irrigated, NI indicates non irrigated | | | | | | | | |

E. Basic Infrastructure Details (data as per 1999)

Table 3.9 Basic Infrastructure Details of Study Villages.

| | Water Source | | Water Bodies | Electricity | Roads | PHC | Post Office- | Education | Sanitation - Toilets | Market Yard |
|------------|---|------------------------------|-----------------|---|--|-------------------------------------|-------------------------|-----------|----------------------|-------------|
| | Drinking/ Domestic | Irrigation | | | | | inside village/ nearest | School | Individual / public | |
| Valuna | Hand pump, open well, pond | Bore well, open well, pond | Pond | GEB Electricity available except some hamlets | Approach road – asphalt in all villages except 2 . In Modersumba and Dholvani, metal roads . | Yes | Yes | 1-7 std. | Nil | Meghraj |
| Modersumba | Hand pump, open wells | Tubewell, open well | Pond | | | 10 km away-nursing home to Shinawad | Vaniyawad | 1-7 std. | Nil | Modasa |
| Bhatkota | Hand pump, open well, Ring bore | Tubewell, open well | Pond, Check dam | | | 5 km away to Shangal | Vaniyawad | 1-10 std. | Nil | Meghraj |
| Vaniawada | Hand pump, open well, ring bore | Tube well, private bore well | 2 ponds | | | 5 km away to Shangal | Vaniyawad | 1-10 std. | Nil | Meghraj |
| Tarakvadia | Hand pump, Government well and private open wells | Pond, river, open well | Pond | | | At Meghraj | Vaniyawad | 1-7 std. | Nil | Meghraj |
| Gokchuvan | Hand pump, bore well . (Old well but dysfunctional) | Tube well | Majum river | | | 4 km away to Shangal | Naviyavad village | 1-4 std. | Nil | Modasa |
| Dholvani | Hand pump, open wells, borewell | Tubewells and open wells. | Nil | | | 5 km away to Shangal | Mulaj village | 1-5 std. | Nil | Modasa |

3.3 Watershed Programme: Activities in the Project Area.

Development Support Centre has worked as the Project Implementation Agency for seven villages in four watershed projects in Meghraj and Modasa talukas with financial support from the District Rural Development Agency, Sabarkantha under the IWDP programme. The project area has slope varying from 2-6 %. Velocity of water and runoff is also high in these areas. The central part of all the watersheds is used for agriculture and hence, needs to be treated for optimum use of natural resources. It is thus necessary to retain moisture in the central land, reduce land degradation, store and recharge water and increase the water table level in the wells in the central part.

Major activities carried out by DSC (working as PIA in IWDP programme) in the region are:

1. Farm bunds:

The project area is slopping with about 2-6% slope also on the agricultural land. The soil is, in general, red-medium black, sandy loam and soft rock; which is prone to land degradation during rains. Furthermore, the intensity of rains is high, leading to overflow of water and thus, reducing water retention in soil.



To overcome the problem, it was necessary to construct farm bunds, so as to retain rain water and moisture in soil, also reducing the slope of land and thus having higher chances of rain water retention in soil. Two types of farm bund are constructed by DSC in different villages; Contour bund with stone and contour bund with earthwork.

2. Gully Plugs:

There are many small streams (gully) in the project area on higher slopes on higher slope. This leads to soil degradation within and outside the periphery. Local community possesses the land on sides and they suffer land degradation.

Gully plugs with loose stones are constructed to reduce the intensity of the flow of the stream, leading to reduced land degradation in nearby areas. This will also lead to filling of vonklas(stream) with silt and thus reducing the overall slope.

3. Nalla Plugs:

Nalla plugs are constructed on medium streams (*vonklas*) in the project area to reduce the intensity of stream water flow, thus decreasing land degradation and increasing water percolation in soil.

4. Check Dam:



A higher slope on land in the project area leads to increased flow of water in the rivulet. This leads to greater run-off and lesser percolation of rainwater. Earthen and masonry check dams are constructed on these rivulets in the project area to check flow of water, reduce land degradation, increasing the percolation rate in

the upstream for wells recharging of tube wells, and ultimately increasing water available for irrigation.

5. Horticulture:

Horticulture is promoted through this programme in the project areas to increase the yield of such crops on agricultural land and increased income to farmers. Various saplings are distributed location wise in each village.

6. Pasture Land Development:

Cattle rearing is the second most important occupation in the project area. However the pasturelands are converted to wastelands, leading to shortage of fodder. Hence, pastureland development has been undertaken by DSC to increase the fodder



availability to promote animal husbandry activities and regain in the area.

7. Livestock improvement:

Medical camps and vaccines were organized for improving health of cattle and thus improving the economic activities linked like increased milk production.

8. Afforestation:

The project area is sloping. On the higher end, water does not retain and at the lower end, water intensity leads to erosion of plantations. Hence, tree plantation is undertaken under the programme on the upper end of slopes with trees like *Sag*, *Neem*, *Desi Baval*, *Ambli* etc to increase water retention on the upper end of slopes and decreasing the intensity of water flow on the lower end.



9. Gabion:

Gabions are constructed on small rivulets to check soil erosion and increase fertility of soil through silt deposition. Such structures are made of rectangular or cylindrical wire mesh cage filled with rock and used for protecting stream, river etc against erosion.

Table 3.10 Status of Physical Activities and funds in four watershed projects implemented by DSC (Till April 2006) .

See Annexure 2 for Capacity Building Initiatives.

| S. N. | Activity/ Project | Project 1. | | Project 2. | | Project 3 | | Project 4. | | Total | |
|----------|---------------------------------------|------------|-----------------|------------|-----------------|---|-----------------|------------------------|-----------------|-------------|-----------------|
| | | Valuna | | Modarsumba | | Bhatkota, Vaniyawada, Tarakvadiya | | Gokchuvan, Dholvani | | | |
| | | Physical | Amount (Rs.) | Physical | Amount (Rs.) | Physical | Amount (Rs.) | Physical | Amount (Rs.) | Physical | Amount (Rs.) |
| | Total Hectares of work | 503 | | 464 | | 618 (197+ 208 + 213) | | 470 (277+ 193) | | 2055 | |
| 1 | Contour Bunding, Running mt. | 16303 | 355978 | 17059 | 308682 | 15229 | 319758 | 13600 | 234756 | 62191 | 1219174 |
| 2 | Gully Plugs Nos. | 4 | 1072 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 1072 |
| 3 | Nala Plugs Nos. | 15 | 275317 | 14 | 196481 | 21 | 288878 | 5 | 85161 | 55 | 845837 |
| 4 | Checkdams Nos. | 7 | 445605 | 3 | 553386 | 4 | 545904 | 2 | 595666 | 16 | 2140561 |
| 5 | Farm Outlets Nos. | 4 | 23907 | 2 | 32750 | 16 | 160346 | 245 | 58649 | 267 | 275652 |
| 6 | Percolation Tanks No. | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 38381 | 1 | 38381 |
| 7 | Gabion structures s No. | 2 | 35652 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 35652 |
| 8 | Sandbag (Bori) Bund- Nos. | 2 | 2600 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2600 |
| 9 | Plantation Nos. | 30400 | 41143 | 17865 | 37220 | 25700 | 51778 | 13850 | 27840 | 87815 | 157981 |
| 10 | Horticulture Nos. | 1720 | 56443 | 1210 | 44038 | 3160 | 99857 | 2010 | 48848 | 8100 | 249186 |
| 11 | Kitchen Gardens Nos. | 100 | 6283 | 245 | 4620 | 300 | 7418 | 110 | 2494 | 755 | 20815 |
| 12 | Cattle Camps (cattle treated in nos.) | 491 | 13350 | 545 | 15000 | 321 | 22198 | 225 | 5097 | 1582 | 55645 |
| 13 | Jethropha , Nos. | 15000 | 31187 | 12500 | 34375 | 15000 | 33960 | 2500 | 4450 | 45000 | 103972 |
| 14 | Gram Vatika, Nos | 1 | 49150 | 1 | 59500 | 1 | 76500 | 1 | 52000 | 4 | 237150 |
| | TOTAL | | 1337687 | | 1286052 | | 1606597 | | 1153342 | | 5383678 |

3.4 Watershed Programme: Work Methodology

DSC has adopted an integrated and participatory approach of the Watershed Programme for overall economic, social and environmental development of the project area. The following methodology was adopted in each project:

1. Information Collection at individual level, Panchayat and government departments for demographic and over all details and maps of each project area.
2. Conducting village level meetings (Gram Sabhas) with exhibitions, video shows and community meetings, in order to explain the concept of watershed and its objectives and brief introduction of DSC and its work.
3. Getting insight of economic and social conditions of the community in each village by household level meetings, community meetings and PRA.
4. Listing the economic and social problems of the village, getting their possible solutions from the community.
5. Finalizing the entry point activity in each village and prioritizing work, based on the needs.
6. Conducting awareness campaigns for watershed and village committee through film shows, exhibitions, village meetings and exposure visits.
7. Identifying the resources of community through transect walk, resource maps and PRA.
8. Finalizing the action plan.
9. Finalizing the watershed group, framing the rules and regulations and appointing lead persons in village level meeting.
10. Giving applications to concerned authorities.
11. Appointing/Forming Watershed Development Association (WDA), Watershed Development Committee (WDC), Watershed Development Teams (WDT), watershed secretary and volunteers, Self Help Groups. Each watershed is allotted one secretary, one Chairman and three volunteers.
12. Training Self Help Groups
13. Formalizing WDA by registration and opening bank account. Finalizing the action plan with the WDA.
14. Finalizing detailed implementation strategy and schedule of activities with WDT, WDC and beneficiaries with their active participation.

4.1 Impact of Watershed Programme on Natural Resource Development

Watershed affects the most vital natural resources: land, water and vegetation. Water retention on upper parts of slopes, reducing the intensity of water and thus reducing soil erosion in the lower part of sloped land has been the main target of the Natural Resource Development in the project area for increased domestic and irrigation water availability and better agricultural yield.

4.1.1 Impact on Groundwater and Irrigation

In all the project villages, the only drinking water source is ground water. Water is drawn from open wells, tube wells and hand pumps. There is no piped supply in the region and there are no major perennial surface water bodies the region. Watershed activities in the project area have undoubtedly increased the retention of rain water in the soil. This has led to increased water table levels in the wells and tube wells and decreased the drinking water problem in the area treated, to a large extent

In Modersomba village, ground water table has risen from 100 ft. to 50 ft. in the last five years. Earlier, water was available in open wells in the monsoon (3-4 months) only. Now it is available for 9 months, since the last two years. In Tarakvadia, ten new hand pumps are installed in the last five years due to increase in ground water table. This has led to some relief in drinking water problems of the village.

Watershed activities have supported increase in the water table level in bore wells and open wells in the treated area. About 189 bore wells and 119 open wells have benefited in terms of increase water table levels. A masonry check dam was constructed benefiting three villages: Tarakvadia, Vaniyawad and Bhatkota. The checkdam recharged 15 wells and 16 bore wells and there was a rise in the water table level by 5-15 ft in the first year.

There is a general perception in all the village that the irrigable land in the region has increased by 20-30% after implementation of the watershed programme and mainly due to an increase in the number of borewells. Of course, overexploitation of ground water can be detrimental to geo hydrology and hence, water recharging must be given due importance here.

The increase in the number of bore wells can also be attributed to a stable ground water table after



implementation of the watershed programme. Many private borewells have been created in the last few years, which indicate that the investment in watershed has also increased private investments in agriculture and irrigation. However, scanty rainfall in the last four years and excessive rainfall this year does not clearly indicate the progressive impact on ground water. The rainfall data of the past 15 years (see Annexure 1) also suggests that the pattern is erratic.

4.1.2 Checked Soil erosion

Table 4.1 indicates the total area of land treated in four watersheds across seven villages. All these activities have contributed to checking soil erosion in varying degrees. The structures have helped in water conservation and augmenting cultivable land in private and common properties.

Table 4.1 Activity wise Area treated for four projects of IWDP

| Activity | Areas treated (in Hectares) | | | |
|--------------------|-----------------------------|---------------|---------------|---------------|
| | Valuna | Bhatkota | Gokchuvan | Modersumba |
| Stone Bund | 14.54 | 1.78 | 1.49 | 4.22 |
| Contour Bund | 122.70 | 118.0 | 83.88 | 114.10 |
| Gully Plug | 0.84 | 2.80 | 0.98 | 0.71 |
| Nalla Plug | 98.90 | 106.00 | 27.59 | 97.83 |
| Check Dam | 157.00 | 198.00 | 200.00 | 210.24 |
| Paka Naka | 12.53 | 69.80 | 14.97 | 13.80 |
| Village Pond | - | - | 14.81 | - |
| Gabion | 17.86 | - | - | - |
| Bori Bund | 1.00 | - | - | - |
| Fodder Development | 0.38 | 0.70 | | 1.01 |
| Afforestation | 15.86 | 13.80 | 10.82 | 8.66 |
| Horticulture | 23.37 | 38.34 | 18.75 | 16.91 |
| Jethropha (seed) | 0.61 | 0.38 | 1.26 | 1.26 |
| Jethropha (plant) | 9.00 | 4.00 | 0.50 | 3.50 |
| Total | 474.59 | 553.60 | 375.05 | 472.24 |
| Grand Total | 1875.48 Ha | | | |

The table 4.1 shows that 75-100% of the total area of micro watershed (500 Ha) have been treated through the programme. While activities like bunds, plantations, afforestation and fodder development will directly check soil erosion; construction of water retaining structures will indirectly contribute to increase in cultivable lands and vegetative cover by increased water availability.

4.1.3 Increase in cultivable land and production

There has been a significant increase in cultivable land in private holding in the past 10 years. The families which were not using their land at all for cultivation due to deficit water availability, limited purchase of seeds and constraint of investing money for agriculture, have now started cultivating crops on the complete portion of their fields. This can be attributed to availability of irrigation water (mostly by bore wells), availability of credit through SHGs and overall improvement in income through agriculture.

Plantations on wastelands have increased the condition of formerly non cultivable wastelands. The land brought under afforestation, plantations and pasture land development, mostly wasteland, is about 70 hectares across four watersheds. This has not only increased green cover but also provided fodder and led to soil and water conservation and increased production and income generation.

Production of wheat, maize and cotton has increased due to improved agricultural practices, better seeds and awareness about appropriate technology, fertilizers and soil conservation methods.

Interaction with individual farmers during the study showed that there has been overall increase in the production in various crops from 5-10% and increase in cultivable land by 2-5%.

There is a general increase across all seven villages in the yield of cotton by 20-40kg per *vigha* due to moisture conservation, check on soil erosion by farm bunding and irrigation availability by water harvesting structures. Increase in production of maize is 5-10 Kg per *vigha* in Vaniavada. Udabhai of Bhatkota could produce 1200 Kg of wheat with 20 Kg wheat seeds (GW 273), which was purchased from Vijapur Wheat Research Centre. Better seeds and agricultural practice has increased the total production by 100%. This was an amazing feat by an ordinary farmer.

In fact, table 4.2 indicates that there is no barren or uncultivable land in the project area (figures of 2001). 84% of the area is sown for agriculture produce. While private cultivable waste is only 0.23% (in one village only), the public cultivable waste amounts to 3% of the total area. This



cultivable waste land is now used for Jethropha plantation. The project area covers forest land in only two villages and that too amounts to 2% of the total area and hence no programmes were targeted on forest produce or forest land development.

Table 4.2 Land use Pattern of Study Villages in year 1999

| Sr. No | Village | Total area (Hectare) | | | | | | | Total |
|--------|-------------------|----------------------|------------------------------|------------------|--------------|---------------|----------------|---------------|---------------|
| | | Forest Land | Barren and Uncultivable Land | Cultivable waste | | Gauchar | Net area Sown | Others | |
| | | | | Private | Public | | | | |
| | | | Land | | | | | | |
| 1 | Gokchuvan | 0 | 0 | 0 | 3.27 | 8.57 | 265.59 | 0 | 277.43 |
| 2 | Dholvani | 0 | 0 | 0 | 3.27 | 8.57 | 265.59 | 0 | 277.43 |
| 3 | Valuna | 44.15 | 0 | 0 | 14.74 | 16.32 | 403.66 | 0 | 478.87 |
| 4 | Tarakvadia | 0 | 0 | 4.77 | 16.93 | 0.45 | 149.76 | 3.34 | 175.25 |
| 5 | Modrasumba | 0 | 0 | 0 | 10.56 | 32.19 | 334 | 97.00 | 473.75 |
| 6 | Bhatkota | 5.00 | 0 | 0 | 8.68 | 22.05 | 166.63 | 0 | 202.36 |
| 7 | Vaniyavada | 0 | 0 | 0 | 9.61 | 21.41 | 177.01 | 0 | 208.03 |
| | Total | 49.15 | 0 | 4.77 | 67.06 | 109.56 | 1762.24 | 100.34 | 2093.1 |
| | Average | 7.0 | 0 | 0.7 | 9.6 | 15.7 | 251.7 | 14.3 | 299.0 |
| | Percentage | 2% | 0% | 0.23% | 3% | 5% | 84% | 5% | 100% |

4.2 Impact of Water Shed Programme on Social Development

4.2.1 Institutional building

Institutional building encourages subtle changes in social and political structures of the society. Well-articulated and mobilized institutions can work wonders for the development of the village and society. There has been mandatory provision to develop village level institutions under watershed programmes which includes water user associations, Self Help groups, Watershed Committee, Federations etc. Some of the observations inferred from the interaction of various institutions are described below:

a. Federation

The Federation is an umbrella institution, consisting of representation of watershed committees, user groups, and SHGs in the region. DSC facilitated formation of a federation of 4 IWDP watershed projects and 3 State government projects, implemented by it. It covers ten villages in Modasa and Meghraj taluka. This federation was initiated in 2004, and currently is in developing stage. The federation has 24 members, consisting of a president, secretaries and members of seven watershed projects and representatives of cluster SHGs of these projects.

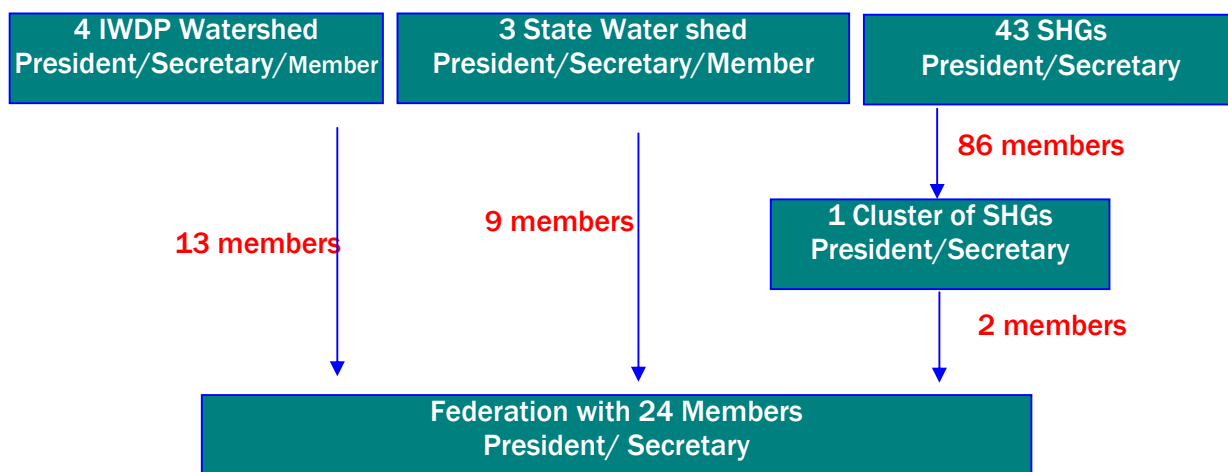


Chart 4.1 Structure of Federation

The main activities of the federation have been generating awareness for better agriculture practices, information dissemination of agri- products, soil and moisture conservation techniques, water harvesting methods, market linkages for seeds and agri -produce and linkages with agri -research institutions. The federation is constantly building its capacities and carrying out activities for agri- inputs in the project area.

People feel that the formation of the federation itself is empowering, as its members work at a platform, which was never imagined earlier. Interaction with state agencies, market linkages, research institutions, corporates etc provides tremendous confidence among the members and subsequently, to the villagers.

b. Watershed Committee

Each watershed project has a watershed committee responsible for planning and implementation of the project activities.

It was observed that watershed committees meet regularly every month to discuss the progress of the work and chalk out future plans. The committee also selects beneficiaries and assigns work to volunteers of the programme. While selecting beneficiaries, the committee ensures principles of watershed along with equity issues. This is a critical issue, as the success of watershed activities depends on the selection of land for a particular activity. Simultaneously care should be taken that poor and landless are not left behind (Refer Ch.5 Sec. 5.4.5). The watershed committee also plays a major role in dispute resolution and smooth implementation of the programme. In one instance, a dispute on the location of the checkdam between Bhatkota and Vaniawada was resolved amicably (Refer Ch.5 Sec. 5.4.7). However, the committee has very limited interaction with village panchayat, and this can be a cause of concern as the Panchayat is the constituted body of village, which can be highly effective in enhancing the cause of the committee.

c. Gram Sabha

- The Gramsabha is held quarterly in the project villages, unlike half yearly in other villages, which is a positive step in term of community involvement in the whole process of village development.
- However, involvement of women seems insignificant. In all the villages, the presence of women in the Gramsabha is very less.

d. Women SHGs

- Involvement of SHGs in social actions is significant and sends strong signals to administration and society. It shows awareness, empowerment and involvement of women in social processes. The instances of social actions are described in case study 1.
- Intra group loans are used mainly for health and education causes. Some loans are also used for income generation activities like woolen torans, sale of soaps, kites etc.
- Active participation in Government schemes such as Total Sanitation Campaign (TSC), National Rural Employment Generation Scheme (NREGS), Swa Shakti, Biogas, Relief works, Sujalam Sufalam, Checkdam- 60-40.

Case Study 1 – Social action by SHG: Case of Urvashi group, Bhatkota

Urvashi Self Help Group of Bhatkota was formed in 2001. Initially it had 15 members which has reduced to 10 now. Some of the women have left the group as they lost interest or had personal and family constraints. Total savings of the group as of now are Rs. 40000. Major part of the money is in circulation in form of intra group loan. The amount of loan varies from Rs. 300 to Rs. 5000 according to the need of the member. These loans are mainly used for delivery cases, medicines, agri inputs, shops, buffalo, and fodder. Income generation activities such as purchase and sale of Kites, Soap and shampoo is done through Cluster of SHGs. Bhuriben, a member of this group expresses, “Exposure visits during and after watershed programme have increased my overall awareness. We had been to Bangalore, Alwar and various parts of Gujarat for different trainings. Various activities in the group has build our confidence to interact with officers and other educated persons. Status of women in the house and in the village have gained respect and significance.” On asking what they need now, Bhuriben replied, “ we need more training on enterprise development, so that we can give meaningful direction to the group.”

The other SHGs of Bhatkota like the Saroj Mandal are also taking up issues in interest of the community and village. In one such instance, women of all SHG came together and protested stop the construction of community hall, which was under construction on a plot near Sarpanch's house. Allegedly, Sarpanch had selected the site which would not only benefit him, but was inaccessible to the poor families which were living far off. After long struggle for several weeks, Sarpanch gave into the pressure from SHG women and other people of the village and agreed to build community hall in the hamlet of marginal families.

This incident was first in the village and the area to take note of the capabilities of women SHGs. Inspired by this event; there have been many instances in Bhatkota and surrounding villages, where women SHGs have put up fight against injustice and for their rights.

e. Users' Association

- There has been 10% clear contribution by the users in case of a watershed structure on common property and 15-25% contribution in case of private property. This indicates active participation of the community in terms of finance.
- Community contribution is planned to be used for maintenance and repair of the structures, which indicates sustainable practice. Most of these funds have not been used as the structures are not more than two years old. However the same would be used this year to repairs, if any, for damage of contour bunds and other water harvesting structures due to heavy rainfall.
- With support of community, DSC was able to construct and manage large structures such as a check dam in Dholvani worth Rs. 3.5 Lakhs
- UA has constantly monitored the structure during construction, which also indicates active participation of the community and good mobilization of the PIA.

Limitations of Social Development

- Trainings on volleyball making imparted to SHGs have not proved effective. They failed to provide market linkages and thus the community lost long-term interest.
- Role of SHG in WS activities is limited to decision making and management of assets.

List of village level institutions is as per Annexure 3

4.2.2 Checked Stress Migration

Before commencement of the watershed programme, low productivity of land and subsequent low income in the study villages forced landless and poor families to migrate in search of a livelihood. The level of stress migration is the direct indicator of the status of livelihood in a village.

After the watershed programme, there have been better employment opportunities, increased access to credit through SHGs and better agricultural productivity leading to increased production. This has helped in lowering migration in the villages of Meghraj and Modasa.

Watershed Programme has increased the agricultural input by land owners and thus also increased employment for people not possessing land. Most of the families in Bhatkota village went out for employment before the interventions. "With increased agricultural input, we (land owners) hire local people for labour work, thus reducing our work stress and providing employment to local people in the village itself" says, Bhuriben, President Urvashi SHG, Bhatkota.

The same benefits are accrued in Modersomba, where long term migration has been reduced to a large extent. Five years earlier, about 25% families migrated for

employment. After the watershed shed programme, only 8-10 families of Modersumba go in search of labour work for about 3-4 months.

Formerly villagers use to take credit from money-lenders at high rates of interest. However, due to collection of the pool during the watershed programme, they can avail of loans through the federation at lower rates of interest.

4.2.3 Gender perspective and women empowerment

The role of women in decision making at the village level, and even in the watershed management, remains quite sidelined. It is limited to collecting contributions and contributing to labour work in construction activity. There is negligible involvement of women in decision making in planning, management of assets and monitoring of watershed activities in the village and beyond.

However, as explained in case study 2, there have been some active social actions carried out by SHG in Valuna and Bhatkota. The findings of these two villages are encouraging and a ray of hope exists for strengthening of women institutions in the villages through the watershed programme. Some basic changes observed in the women after the programme are:

- Women in SHG feel more confident to interact with people, officers, panchayat, bank and doctors
- Status of women has increased in society and family.
- Their opinion and decision in family matters counts now.
- Income generation and savings, credit through SHG has improved health and education conditions and also helped families in time of crisis
- Bonding among the members through SHGs have worked as an impetus for larger social action
- Community has started paying attention to girl's education, specifically for higher education

4.2.4 Landless Community

The proportion of landless families in the project area is less than 5% of the total families. Hence no special programme was developed for them. Nonetheless, they should not be ignored in the development process. These marginal families can be the part of indirect benefits and can be included in the user groups, SHGs and other institutions. Most of them are part of institutions or SHG's, but not part of user groups in the project area.

Case Study 2 – Social action by SHG: Case of Jay Lakshmi group, Valuna

There are two SHGs in Harijanvaas of Valuna- Jaylaxmi savings group and Jay Dashama savings group, each having 15 members. Neelaben of Jay Laxmi group informs that the group has been functional for last four years. An average of Rs. 35000 circulates as intra loans each year. The groups have also got accreditation from the bank, which says a lot about their performance. They have got license to purchase and sell the seeds but currently, the federation does this activity using their license. However, they are satisfied with federation's activities and happy that they get better seeds at reasonable price. Street plays and awareness campaign were organized this year by federation.

Rekhaben of Jay Dashama group says that women in their village were prohibited for going out formerly. Now they had been to Wankaner, Bhiloda, Devgadbaria and other places for various trainings and exposure visits. This has instilled tremendous confidence in women in their village. Women are now dreaming to have small enterprise, shops and jobs outside village, which was unimaginable a few years ago. They underwent foot ball making training, but somehow it could not be realized into the enterprise.

Intra group loans are mostly used for purchase of agri-inputs and tools, medicines and to use in emergency situations like accidents, delivery etc. In watershed activities, SHG contributed water for construction of check dam, while monitoring of construction was done by villagers. SHG also paid for labour work for construction of cattle trough. These groups are also active in taking up social issues in the village. In one such instance, women members locked the primary school of the village when they found the teacher playing carom in the school hours. Allegedly school teacher was very irregular and did not teach satisfactorily. Performance of the students was far from satisfactory. Complaints made to Panchayat and other authorities at Taluka level did not get the response. One day women went to school and locked it. They threatened the teacher that school would not open till the teacher was transferred and they get assurance of better performance. The teacher apologized to the villagers and assured of regular teaching. After that incident, teaching was found regular in the school.

In another such incident, members of SHG rallied to Taluka Panchayat office when their repeated applications to repair the only working hand pump in the village failed to evoke any response from Taluka Panchayat and water supply board. They threatened TDO to demonstrate heavy protests if they failed to repair the hand pump within 15 days. This was enough to awake the authorities and the hand pump was repaired.

It seems that WS activities have not improved conditions of landless community significantly. Apart from some small time labour work in the activities, there has not been done much to improve their livelihood. Vadi families of Modersomba still have to go out in search of work for two months during summer. Many families of Tarakvadia still go out in search of labour work for 2-3 months.

4.2.5 Investments in CPR

It is common perception that CPRs are more useful to poor and marginal families than the better off. Any regulation or change in the use pattern in CPR is bound to have its implication on the livelihood of these families. However, in case of Meghraj, the CPRs treated in watershed were mainly wastelands, unused pasturelands and traverse land of rivulets and drains. The activities carried out in CPRs were not kind of social fencing or regulating. On the contrary, water retaining structures, plantations etc were done in CPRs. Most of the water harvesting structure like check dams, nalla plugs, gabion and *paka nakas* are on CPRs. Also, new initiatives like *Jethropa* plantation were done on pastureland for income generation. These plantations are maintained by extension volunteers of watershed programme and managed by the Watershed committee. Thus interventions related to CPR are perceived as beneficial to a large population and village institutions. These interventions have not affected poor and marginal in a

adverse manner, even though the benefits from them have been limited for poor families.

4.3 Impact of Water Shed Programme on Economic Parameters

4.3.1 Employment Generation through Watershed Programme

Along with the long term impacts on NRM and social aspects, the watershed programme has provided employment generation during its implementation. About 700 beneficiaries have been provided employment for a total of 33,294 person days in 7 villages. This means that wages of Rs. 2,330,580 have been provided as employment amongst 4553 people across seven villages. This also indicates that 50% of the total amount spend on physical work has been utilized for the labour component, thus providing employment.

4.3.2 Use of Common Property Resources (CPR) for income generation

Plantation of *Jethropa* and other plants, creation of village gardens and afforestation have helped utilize CPR to benefit watershed. Ecological conservation, income generation, checking soil erosion and increase in fodder and fuel wood are the some of the benefits of plantations in CPRs.



4.3.3 Better agricultural practices

With availability of increased irrigation water, training, awareness generation and exposure visits through watershed programme, farmers in the study villages have initiated better agricultural practices. Changes in crop pattern, use of better seeds and manure etc have benefited in terms of better yields of crop and thus higher incomes.

In all the study villages, yield of cotton has doubled due to introduction of BT cotton. However the prices of cotton have fallen from Rs. 300 per KG to Rs. 200 per Kg. This has limited the overall profit of farmers. A new variety of sweet corn has been introduced in these villages, which has higher market value and acceptability. This has

Case Study 4

Individual Initiatives for better agricultural practices and entrepreneurship development

Bachubhai Ninama of Valuna is Secretary of Federation of 7 watersheds across 10 villages of Meghraj and Mosdasa. He is enthusiastic and hard working. He has experimented with the new agricultural technologies and crops. Through his own investments and risks he has successfully initiated vermi-compost fertilizers. He even sells these fertilizers to various government and private purchasers.

He has also experimented successfully on crops like Sunflower, Sweet corn and BT cotton. Where there are instances of failure of new hybrid crops in the village, Bachubhai through his meticulous and hard working, have succeeded in every crop and experiment he has done.

All these initiatives were possible because of awareness generation, training and exposure visits in watershed programme. He is so excited to work for watershed programmes that, he is now planning to start a small organization and take up water sand soil conservation activities, agriculture enhancement activities in partnership with Government and established NGOs.

Similarly Kalubhai of Gokchuvan has grown teak trees on small land. He is happy to see that the trees have grown 8 feet tall in two years. This plant is introduced after the interventions.

helped in increased income. Similarly other crops like sunflowers and paddy and plantations like Teak (Valsadi Saag) are introduced in the region. Kitchen Gardens have also been initiated, which has supplemented to their own nutritive food.

4.3.4 Income generation through livestock improvement

In arid and semi arid regions with erratic rainfall, cattle rearing and animal husbandry form major occupations. However, in the study villages, very few families solely depended on the livestock. They did have supplementary income from livestock.

After the interventions, livestock has increased in the village due to increased income and availability of fodder. Formerly, there used to be a scarcity of fodder in summers every year, but now it is available in summers too. These changes can be attributed to the watershed programme indirectly. In villages like Valuna and Bhatkota where there are dairy cooperatives, production of milk has doubled in last three years. However this does not indicate an increase in per capita production. The study shows that there has been little focus to improve livestock quality and yield through watershed projects.



No significant improvement in new income generation opportunities through small livestock have been seen in the whole programme.

4.4 Watershed Programme: Investment versus Benefits

Investment pattern in a watershed programmes can give clear idea of the strategy adopted (or not adopted) for the priority areas. It is therefore necessary to evaluate the investment in terms of intensity and coverage of the outputs. Intensity of outputs is assessed by the quantum of benefits per capita accrued, while coverage of outputs can be assessed by the area benefited and percentage of beneficiaries. Table 4.6 and 4.7 indicate the investment pattern in the programme.

Table 4.3 Pattern of investment in Watershed Programme

| | Natural Resource Development (A) | | | | Social Development (B) | Enterprise Development (C) | | |
|--|----------------------------------|-----------|----------|------------------|--|----------------------------|----------|-----------------|
| | Soil | Water | Biomass | Total | Community Organization, Training and EPA | Farm | Non Farm | Total |
| Rs. | 15,31,150 | 30,27,379 | 4,15,946 | 49,74,475 | 6,38,483 | 3,53,158 | 55,645 | 4,088,03 |
| % of TOTAL | 25.43 | 50.27 | 6.91 | 82.61 | 10.61 | 5.87 | 0.92 | 6.79 |
| TOTAL (A + B + C) = Rs. 60,21,761 | | | | | | | | |

Out of total investments of Rs. 60,21,761 on various activities, 82.6% is spent on natural resource development with water conservation getting the highest priority. About 10.61% of the funds are spent on social development through trainings, EPA and various awareness programmes. Though enterprise development was not the prime focus of the programme, 6.79% of the funds are invested in horticulture, upgradation of CPR, livestock improvement and income generation through institutions.

Table 4.4 gives detail of investment, treated area and approximate beneficiaries for each activity. Around 82% of the investments are in three activities Nalla Plugs, Checkdams and contour bunds; i.e. most of the investments are aimed to improve natural resource, mainly water recharging and soil and moisture conservation. While contour bunds are only in private lands, Nalla plugs and check dams, which are constructed on streams and rivulets mostly in Panchayat land. However, it benefits to open wells and borewells, which are owned privately.

Table 4.4 also shows the percentage of families benefited against the investment in each physical activity in the watershed programme. It indicates that there has been maximum investment on check dams, (about 40 % of the total investment on construction activities), from which 765 hectares of land have been treated directly or indirectly. Villagers also acknowledge that checkdams have been beneficial to recharge ground water and subsequent increase in irrigation through borewells and openwells.

Considering the geography, climatic conditions, soil conditions and socio economic conditions of the region, the investment in conservation of soil and water seems to be best suited by PIA. It has a trickling effect as the benefit of investment in these activities lead to other opportunities of social and economic development of society.

Table 4.4 Comparative Analysis of Investment versus families benefited

| | | Project 1 | | | | | | Project 2 | | | | | | Project 3 | | | | | | Project 4 | | | | | | Project TOTAL | | | | | |
|------|--------------------------------------|---------------------|-----|--------------|----|------------|------------|---------------------|-----|--------------|----|------------|------------|----------------------------------|-----|--------------|----|------------|------------|---------------------|-----|--------------|----|------------|------------|---------------------|-------|--------------|--------|------------|------------|
| | | Valuna | | | | | | Modersumba | | | | | | Bhakota, Vanliyawada, Tarakvadla | | | | | | Gokchuvan, Dholvani | | | | | | | | | | | |
| | | Families Benefitted | | Area Treated | | Investment | | Families Benefitted | | Area Treated | | Investment | | Families Benefitted | | Area Treated | | Investment | | Families Benefitted | | Area Treated | | Investment | | Families Benefitted | | Area Treated | | Investment | |
| S.N. | Activity | No. | % | Ha | % | Rs. | % of total | No. | % | Ha | % | Rs. | % of total | No. | % | Ha | % | Rs. | % of total | No. | % | Ha | % | Rs. | % of total | No. | Avg % | Ha | Avg. % | Rs. | % of total |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Contour Bunding | 141 | 100 | 138 | 29 | 355978 | 26.6 | 141 | 100 | 118 | 25 | 308682 | 24.0 | 254 | 100 | 120 | 22 | 319758 | 20 | 111 | 100 | 85 | 23 | 234756 | 20.4 | 647 | 75 | 461 | 25 | 1219174 | 22.6 |
| 2 | Gully Plugs No. | 8 | 6 | 1 | | 1072 | 0.1 | | | | | | | | | | | | | | | | | | | 1 | 1 | 0 | 1072 | 0.0 | |
| 3 | Nala Plugs No. | 45 | 32 | 99 | 21 | 275317 | 20.6 | 42 | 30 | 98 | 21 | 196481 | 15.3 | 63 | 25 | 106 | 19 | 288878 | 18 | 15 | 14 | 28 | 7 | 85161 | 7.4 | 165 | 22 | 330 | 17 | 845837 | 15.7 |
| 4 | Checkdams No. | 80 | 57 | 157 | 33 | 445605 | 33.3 | 30 | 21 | 210 | 45 | 553386 | 43.0 | 40 | 16 | 198 | 36 | 545904 | 34 | 20 | 18 | 200 | 53 | 595666 | 51.6 | 170 | 23 | 765 | 42 | 2140561 | 39.8 |
| 5 | Farm Outlets No. | 4 | 3 | 13 | 3 | 23907 | 1.8 | 2 | 1 | 14 | 3 | 32750 | 2.5 | 16 | 6 | 70 | 13 | 160346 | 10 | 6 | 5 | 15 | 4 | 58649 | 5.1 | 28 | 3 | 111 | 6 | 275652 | 5.1 |
| 6 | Percolation Tanks No. | | | | | | | | | | | | | | | | | | | 8 | 7 | 15 | 4 | 38381 | 3.3 | 8 | 0 | 15 | 1 | 38381 | 0.7 |
| 7 | Gabions No. | 8 | 6 | 18 | 4 | 35652 | 2.7 | | | | | | | | | | | | | | | | | 0.0 | 8 | 1 | 18 | 1 | 35652 | 0.7 | |
| 8 | Sandbag (Bori) Bund- No. | 15 | 11 | 1 | 0 | 2600 | 0.2 | | | | | | | | | | | | | | | | | 0.0 | 15 | 3 | 1 | 0 | 2600 | 0.0 | |
| 9 | Plantation No. | 141 | 100 | 16 | 3 | 41143 | 3.1 | 141 | 100 | 9 | 2 | 37220 | 2.9 | 254 | 100 | 14 | 3 | 51778 | 3 | 111 | 100 | 11 | 3 | 27840 | 2.4 | 647 | 75 | 49 | 3 | 157981 | 2.9 |
| 10 | Horticulture No. | 35 | 25 | 23 | 5 | 56443 | 4.2 | 24 | 17 | 17 | 4 | 44038 | 3.4 | 63 | 25 | 38 | 7 | 99857 | 6 | 40 | 36 | 19 | 5 | 48848 | 4.2 | 162 | 17 | 97 | 5 | 249186 | 4.6 |
| 11 | Kitchen Gardens No. | 100 | 71 | | | 6283 | 0.5 | 141 | 100 | | | 4620 | 0.4 | 254 | 100 | | | 7418 | 0 | 111 | 100 | | | 2494 | 0.2 | 606 | 68 | | | 20815 | 0.4 |
| 12 | Cattle Camps (cattle treated in no.) | 98 | 70 | | | 13350 | 1.0 | 109 | 77 | | | 15000 | 1.2 | 64 | 25 | | | 22198 | 1 | 45 | 41 | | | 5097 | 0.4 | 316 | 43 | | | 55645 | 1.0 |
| 13 | Jethropha | 141 | 100 | 10 | | 31187 | 2.3 | 141 | 100 | 1 | 0 | 34375 | 2.7 | 254 | 100 | | | 33960 | 2 | 111 | 100 | 1 | 0 | 4450 | 0.4 | 647 | 75 | 13 | | 103972 | 1.9 |
| 14 | Gram Vatika | 141 | 100 | 0.5 | | 49150 | 3.7 | 141 | 100 | 0.5 | | 59500 | 4.6 | 254 | 100 | 0.5 | | 76500 | 5 | 111 | 100 | 0.5 | | 52000 | 4.5 | 647 | 75 | 2 | | 237150 | 4.4 |
| | TOTAL | | | 476 | | 1337687 | | | | 467 | | 1286052 | 100.0 | | | 546 | | 1606597 | | | | 374 | | 1153342 | | | | 1863 | | 5383678 | 100.0 |

4.5 Analyzing Watershed Programme by DSC as per basic Guidelines for watershed programme

Table 4.5 Comparative Analysis of Guidelines for Watershed Programme with DSC Programme

| Guideline for Watershed Development- Ministry of Rural Areas and Employment. Department of Wasteland Development | Achievements- DSC Programme |
|--|--|
| A. Project Objective | |
| Promote economic development through optimum utilization of natural resource, and employment generation | This objective is well achieved as more than 75% of area is treated through various activities and has generated more than 700 days of labour |
| Restoration of ecological balance through community action, technical assistance and institutional arrangements | Soil erosion has been checked, ground water table is improved and agriculture practices have improved. The technical competence is appreciated by DRDA. Institutions are developing towards self-sustainability. |
| Social and economic empowerment of poor and disadvantaged through equitable distribution of benefits and greater access to income generating opportunities | Care has been taken in the implementation to include most disadvantageous families of the village in each activity. |
| | |
| B. End results | |
| All the planned activities are completed with active participation and contribution of user group | Result achieved |
| User groups/ Panchayats have willingly taken over the O&M of assets and made suitable arrangements for maintenance and development | Result Achieved |
| All members of all the institutions created in the programme have build their capabilities to operate and discharge their duties on withdrawal of PIA | Institutions have developed considerable skills and knowledge for self sustainability. DSC intends to support these institutions, federation in particular, to enhance their capabilities and work effectively for all round development of village. |
| SHGs have achieved sufficient commitment from their members and built up financial resources to be self sustaining | Most of the SHGs have been functioning successfully for more than three years now, however, there is felt need for linkage to income generating activities and market |

| | |
|--|---|
| C. Success Criteria (General) | |
| Around 80% of the watershed area is covered with treatment or development activities | 75-80% of the watershed area is treated |
| Around 80% of the project activities are implemented through user groups | All the activities of the watershed programme are implemented through user group and committee |
| Around 80% of the works are completed within time and cost estimates | Delays in fund allocation from government, leading to over all delay in the programme completion. |
| If found suitable, 80% of the works utilize local technical knowledge for engineering designs or modify to improve them to use it. | Local material, labour and technology is used in all the works |
| Around 80% of the technologies for crop management/afforestation/animal husbandry/horticulture etc. are adopted by roughly 50% members of the user group. | All the members of user groups have adopted the suitable technologies for soil and water conservation |
| Around 80% of the completed works or common property resources are taken over for O&M by user group/ Panchayat | All the completed works in CPR are taken over by WS committee and user groups |
| D. SHG | |
| Around 50% of the watershed community are enrolled as members of at least one SHG | Achieved |
| Separate SHGs are organized for women, SC/ST, agri- labour, shepherd etc | Group wise SHGs have been formed |
| Around 80% of SHGs <ul style="list-style-type: none"> - meet regularly at least once a month and take decisions by common consensus amongst the members - transact business with about 50% of resources generated from the members - have timely recoveries of around 80% of the out-standings. - Maintain their accounts up-to-date | SHGs meet regularly every month. Most of the decisions are taken with consensus. Loan recoveries have been timely and accounts are maintained properly. |
| E. User Group | |
| Around 50% of the families in watershed community are represented in at least one user group | Achieved |
| Around 80% of the watershed development works are carried out through the concerned user group | All the activities under watershed are carried out by user groups and committee. |

| | |
|---|--|
| <p>Around 80% of the user group</p> <ul style="list-style-type: none"> - meet regularly once a month and take decisions by common consensus amongst the members - have around 80% members who have contributed for the related work in terms of cash, kind or labour as per the prescribed norm - submit their accounts regularly to the WDC and WDT - actually take over the O&M of the completed community works on CPR | <p>User group meet regularly when the work is in progress. All the members have contributed to the project in cash or kind. All the user groups have taken over the completed works.</p> |
| F. Trainings | |
| <p>Around 80% of Multi Disciplinary team members, user and self help group members, WDC members, Watershed secretary and volunteers are given training on project plan.</p> | <p>Achieved</p> |

DSC has been successful in achieving targets as per the general guidelines for watershed programme in all areas. However due to delayed fund allocation from government, there has been delays in some activities in the programme. It is appreciable that even after delayed and limited funding, DSC has maintained its base at Meghraj and its support to village institutions in the region.

5.1 Major findings of the study

1. There is 10-15% increase in irrigable land. This is mainly due to increase in bore wells due to stabilized ground water and increase in household income. However increased bore wells do indicate ground water exploitation.
2. There is increase in cultivable land with adoption of new seeds, technology, use of wastelands and available credit.
3. Watershed activities are widely acknowledged by people, who are sure of getting better results in coming years. There have been encouraging individual initiatives taken to promote good agricultural practices. Activities of the federation and its helpfulness is also acknowledged widely.
4. There has been significant awareness generation on better agriculture practices, government schemes, rights and responsibilities of community and panchayat and overall development issues. This can be attributed largely to exposure visits, trainings and awareness programmes conducted by PIA in the watershed programme. However the programme has not been successful in initiating pressure groups for working in the interest of overall development of the community.
5. Overall, there has been a positive impact on existing livelihood patterns of tribals and other community. Household income has increased vis- a -vis expenditure and purchase capacity. Stress migration is checked significantly in the last couple of years. The pattern of expenditure in a family has also undergone positive change. Some years ago, a major part of their income was spent in debt repayment and purchase of basic food items (maize flour, pulses, oil, onion). Now, they are spending on investments in agriculture, health, education and supplementary food items like ghee, vegetables, *bajra* flour, rice etc.
6. Institutions made in watershed programmes need further support for a couple of years in terms of capacity building and market linkages to make them sustainable and self-motivated. Also the SHGs need to be linked with some income generation activities, without which they will lose the momentum for development.
7. The federation have been successful in generating awareness for better agriculture practices, information dissemination of agri- products, soil and moisture conservation techniques, water harvesting methods, market linkages for seeds and agri -produce and linkages with agri -research institutions. People feel that formation of the federation itself is empowering, as the members work at a level which was never

imagined earlier. Interaction with state agencies, market linkages, interaction with research institutions, corporate etc provide tremendous confidence among the members and subsequently to the villagers.

8. Involvement of the landless and labourers in the watershed programme was no more than receiving employment for few days. Some of the families are in the user groups, but they have limited stake in decision making and expressing their opinion. However, it should be noted that the percentage of landless families do not exceed 5% in any of the project villages and hence they do not form the major population.
9. Women in SHG feel more confident to interact with people, officers, panchayat, bank and doctors. Status of women has increased in society and family and their opinion and decision in family matters is considered. Savings, credit through SHG have improved health and education conditions and also helped families in times of crisis. Also, the bonding amongst the members through SHGs have worked as impetus for larger social actions. However, role of women in managing, decision making and monitoring of physical activities of watershed programme has been very limited and insignificant in some villages. Women do participate in labour work, but do not play an active role in important decisions on physical activities of watershed.

5.2 Performance Analysis of Watershed Programme

5.2.1 Factors contributing to performance of watershed programme

Table 5.1 Underlying enabling and disabling factors for Programme

| Enabling factors | Disabling Factors |
|---|--|
| Skilled staff- strong technical staff of PIA | High turnout of staff, less women staff |
| Effective community approaches- consultations, exposure visits, trainings, linkages | Limited transport facilities in the region |
| Various govt. development schemes like TSC, NREGS, Swashakti in project area | Limited and delayed funds from Government |
| Professional approach and clean image of PIA | Dry years followed by excessive rains has difficult to assess the progressive impact of WS (erratic rainfall, low dependability) |

As can be inferred from table 5.1, DSC's programme is widely acknowledged and appreciated for the strong technical and skilled staff, which is the key to effective planning and implementation. Simultaneously, there have been some factors which have disabled the programmes in varying capacities. Low dependability and erratic nature of rainfall makes it difficult to assess the actual, progressive impact of watershed activities.

5.3 Major Limitations of the Watershed Programme

The overall performance of the watershed programme by DSC seems commendable. However there are a few limitations to the overall impact proposed to be achieved by programme. Some factors are external, which some can be attributed to the overall approach of organization.

External factors like dry, consecutive years and excessive rainfall this year, is one of the factor for WS activities not having ceded the desired results.

Major limitations which draw attention are enlisted below:

- WS activities have not improved conditions of poor and marginal farmers significantly. Apart from some small-time labour work in the activities of WS, there has not been much to improve their livelihood. *Vadi* families of Modersomba still have to go out in search of work for two months of summer. 50% of families of Tarakvadia still migrate in search of labour work for 2-3 months, while 10 families migrate for 8 months.
- Most of the SHGs have their presence for more than three years now. However, But initiatives to strengthen their capacities through linkage with various activities like income generating projects, promote life insurance, crop insurance are not observed.
- Not much work is done on livestock improvement. Villagers need more support on livestock management as an alternative IGA.

5.4 Promising and Empowering Practices

5.4.1. Exposure visits and information dissemination by *falla* meetings

Exposure visits and training are the single-most significant activities to bring about a change in community perception and enhance the development programme in the village. Most of the success of the watershed activities can be attributed to exposure visits and subsequent dissemination of information and awareness by the participants.

5.4.2. Market linkage through Federation

People have confidence in the federation and feel that the activity of buying and selling of seeds for crops, which has been taken up by the federation is quite useful to the farmers. They are assured of good quality seeds at a reasonable price.

5.4.3. Income generation through *Jethropha* plantation in wasteland and pastureland by WS committee

Increase in cultivable land and check on soil degradation are important objectives of watershed programmes. Hence, revitalizing the wastelands and proper treatment of degraded land is essential. Moreover, income generation through this approach enhances the impact of a watershed programme. Plantation of *Jethropha* in wastelands and degraded pastureland is one of such activities which is beneficial to all the stakeholders. It provides sustained income to the watershed committee which can be used for further development of the village. It also helps to conserve the ecological balance through

reduced soil and water degradation and checks air pollution (as Jethropha is used for making diesel which is useful in controlling harmful emissions from vehicles). It is thus a win-win situation for all.

5.4.4. Ridge to valley approach and other processes in practice

For a watershed programme, it is very important to know sound technical approaches, which form the very base of success or failure. Moreover, promoting overall understanding of watershed principles amongst the community and other stakeholders is crucial in many areas, such as dispute resolution, equity issues, optimum use of natural resources, social mobilization and inter agency coordination. The ridge –to- valley approach was applied in the project area after careful consideration of geography, geo hydrology, land use pattern and climatic conditions. Initially, when there were difficulties in mobilizing people and deciding upon the land to be treated, exposure visits and training on watershed helped in making people understand the objectives of the watershed.

5.4.5. Selection of beneficiaries in a practical manner

Selection of beneficiaries in a rigid manner in watershed programmes doesn't always work. As the watershed programme deals with improvement of natural resources, it is not always possible to have involvement of most of the poor and landless. The impact of watershed programme can be seen only when land is treated in patches. Selection of beneficiaries in flexible framework has helped attain maximum benefits to the watershed area as whole.

5.4.6. Synergy in various programmes

Often it is observed that there is no coordination between two or more government schemes in the village. Most of the times, it is possible to plan and integrate various schemes to get maximum benefits in the village. Sometimes, it also helps to deliver benefits in an equitable manner and solve conflicts among the villagers. While DSC was directly involved in other government programmes in the village such as *Swa Shakti*, it helped in the promotion of other schemes such as *Swajaldhara*, *Sujalam Sufalam*, Total Sanitation Campaign (TSC), National Rural Employment Guarantee Scheme (NREGS), *Indira Awas Yojana* (IAY), *Sardar Awas Yojana* (SAY) and other development schemes for tribals in an integrated manner.

5.4.7. Let communities resolve their own dispute

There was a conflict between the villagers of Bhatkota and Vaniawada over the location of a major check dam. Both parties insisted on different locations to avail of the maximum benefits. The PIA programme manager, along with the Watershed Committee, gave their opinion on the location, explaining reasons for it, and also made clear that final decisions have to be taken in consensus. For a long time, there was a stand off. Watershed committee played a crucial role in negotiating with the villagers on both sides and made both the villages come to an amicable solution.

5.5 Potential Synergies

Development programmes cannot work effectively in watertight compartments. Integration of various programmes to suit the needs of the region work out the best for a particular region. In the project area of Meghraj and Modasa too, there are tremendous potentials to tap the opportunities for comprehensive development of the region.

As the area is dominated by tribal and backward communities, there are special benefits in government schemes. Formulation of a vision development plan of the project area through integration of various schemes, Swa Shakti, NREGS, TSC, Watershed etc. would definitely be a path- breaking initiative. Although it needs convergence of financial resources to implement the programme on a sustained basis, the implementation is feasible in a phased manner. Some of the specific issues which can be worked upon to get better results are:

- Convergence of other resources to reduce the financial constraints for effective implementation of the watershed programme. Looking at programme beyond the government scheme, as a vehicle for comprehensive social and economic development.
- Need to focus on drinking water availability and work closely with the community to avail of benefits of the Swajaldhara programme.
- Link women SHGs with income generation activities. It will be difficult for SHGs to keep up their motivation if it is only for savings. Income generation activities will enhance their capabilities, motivate them and bind them together for common interest.
- Helping the Panchayat and TDO in identifying the projects for NREGS to benefit the project villages (with focus on marginal and poor families). Most of the work done under Government relief measures and NREGS is of little use other than for employment generation. Innovative approach and projects will not only increase employment opportunity, but also contribute in village development. .. (e.g. road to Modursumba, employment in watershed activity, pastureland/wasteland development, construction of sanitation units under TSC etc). This can be done with private participation to create more employment. (e.g. materials for construction of community hall can be contributed by the community and labour work can be done under NREGS).
- Meghraj is situated on the border of Gujarat, Rajasthan and Madhya Pradesh and is relatively remote from district and state headquarters. However, the market access seems fair enough to absorb the surplus agricultural produce. Also, private companies often come here to promote their products, including seeds. However, there is scope of improvement to market access and information to villagers and market stakeholders to make them understand the pattern of products and investments, which may be mutually beneficial to farmers as well as the stakeholders. The federation is actively involved in bridging this gap and has a greater role to play in the interest of farmers in the future. In modern times, not all the products produced locally are consumed locally. The marketable surplus

generates cash income for the farmer. In order to get remunerative prices, the farmers need access to markets, as well as market information. In this case, where access to market and information is fair enough, a combined strategy of collective marketing and improvement of physical infrastructure would work well. Activities of the federation, exposure visits and trainings on sound agricultural practices are good initiatives, but have a long way to go.

- Creating more opportunities of livelihood through on farm and non farm based activities can be taken up. Cattle rearing, agri-insurance, food processing units, marketing etc. can be new and promising avenues for institutions and individuals in the region.
- The federation, SHGs and other institutions can be motivated to take up general development issues and can be trained to use acts like RTI and NREGA for their interest. These institutions can work as effective pressure groups for development of the region.

5.6 Stakeholders' Perspective on Watershed Programme

5.6.1 People's perception

People acknowledge the fact that WS activities have increased irrigable land, checked soil erosion, improved soil conditions and augmented awareness and understanding about improved quality of seed, crops, fertilizers and pesticides.

However, those who are not members of any user group opine that the some of the works done in the village are helpful, but they have not availed any benefits out of this. There had been some employment, but it was too small to have an impact on quality of life.

5.6.2 DRDA

The District Rural Development Agency, Sabarkantha seems to be content with the overall performance of DSC for watershed programmes. Interaction with Multi Disciplinary Team (MDT) members reveals that they appreciate the community participation in the programme and technical competence of the DSC staff. They particularly appreciate the site selection of check dams and quality of their construction.

On the social front, the impact of DSC as PIA for the watershed programme have contributed it making over all active SHGs and increasing the confidence of women in the region. However, as per the DRDA report, there are 33 active and 10 non-active groups in the programme undertaken by DSC. The percentage of non active groups under the programme is higher, compared to several other organizations working in the region. This is because of lack of women staff workers for motivation of SHGs in the organization. Nevertheless, involvement of women in other development programmes and their confidence level in some of the project village of DSC have boosted up impressively.

DRDA has specifically commented on the low survival rate of only 20-25% of plantations in the watershed programme undertaken by DSC, due to negligence of proper care by the community. However, it can also be assumed that rainfall has been low in the region, leaving apart 2006 and this could also be one reason for failure of plantations. Moreover, DRDA feels that poor and marginal families have not benefited much by the programme.

The professional approach and clean image of DSC as PIA for the watershed programme have made a positive influence on DRDA, which has recommended DSC to undertake large projects in the region.

5.6.3 PIA staff

The PIA staff at Meghraj office have played a major role in the success of the watershed programme. They have been able to achieve excellent technical quality and community participation.

The coordinator feels that there is a need to supplement DRDA funds with other funding sources for effective social mobilization.

The lack of transport facilities, other infrastructure and remoteness of the area have led to physical hardships for the PIA staff of this specific region.

Annexure 1 Average Rainfall of Sabarkantha District over last 10 years

| Sr. No. | Year | Annual Rainfall mm. |
|-------------------------|-------------|------------------------------------|
| 1 | 1995 | 923 |
| 2 | 1996 | 832 |
| 3 | 1997 | 734 |
| 4 | 1998 | 1023 |
| 5 | 1999 | 794 |
| 6 | 2000 | 870 |
| 7 | 2001 | 650 |
| 8 | 2002 | 848 |
| 9 | 2003 | 735 |
| 10 | 2004 | 578 |
| 11 | 2005 | 422 |
| 12 | 2006 | 2050 |
| Average Rainfall | | 871.58 |

Annexure 2 Capacity Building Initiative under Watershed Programme by DSC

1. Training Programme

| No. | Type of Training | Target Group | Duration | Place | No. of participants | Subjects Covered |
|-----|--|--------------------------------------|----------------------------------|-------------------------------|---------------------|---|
| 1 | Watershed Concept and participatory approach | Secretaries and Extension Volunteers | 5-8 August 1999 | Shreyas Foundation. Ahmedabad | 24 | Watershed approach, guidelines; role of secretaries and Evs; understating of rural development programmes |
| 2 | Account Training | Secretaries | 20-25 Feb , 2000 | Shreyas Foundation. Ahmedabad | 4 | Accounting system in watershed programme, importance of accounts, practical on voucher, cashbook and ledger writing, watershed administration, files and registers. |
| 3 | Watershed Technical training | Extension volunteers | 26-27 th March , 2000 | Meghraj | 11 | Watershed development treatment measures, measurements of earth work, layout of contour bunds, calculations for measurement sheets |
| 4 | Leadership training | Leaders of SHG | 12 th march, 2000 | Meghraj | 25 | Institute strengths, values of good leaders, attitude and behavior for leadership |
| 5 | Watershed committee training | Watershed committee members | 27-28 th June, 2000 | Meghraj | 27 | Watershed guidelines, different treatment measures for watershed, roles and responsibility of WC members |
| 6 | Account Training | Secretaries | 28-31 Aug , 2000 | Meghraj | 5 | Accounts records keeping, Practical on Cashbook & Ledger, Trial Balance Sheet, Report Writing |
| 7 | Watershed Technical training | Extension volunteers | 29 Sept. 2000 | Meghraj | 7 | Quality control of watershed treatment activities |
| 8 | SHG | SHG members | 4 Nov,2000 | Meghraj | 64 | Importance of SHG, saving and credit activities, |
| 9 | SHG | Pramukh and secretary | 29 th Sept, 2000 | Meghraj | 29 | Record keeping of SHG |

| | | | | | | |
|----|--|-----------------------------|----------------------------|-------------------|----|---|
| 10 | Watershed Committee | WC members | 9 Nov ,2000 | Meghraj | 22 | Watershed administration, work execution |
| 11 | SHG | SHG members | 22 Nov, 2000 | Modersumba | 9 | Need and importance of group formation |
| 12 | Watershed Committee training | WC members | 13-14 Feb, 2001 | Meghraj | 26 | Watershed concept, implementation of watershed activities. |
| 13 | Watershed committee training | WC members | 29-30 March, 2001 | Meghraj | 16 | Strengthen the watershed institution, quality monitoring of watershed works, general accounting system and monitoring |
| 14 | Account - refresher training | secretaries | 30 May, 2001 | Meghraj | 4 | Watershed account (cash book, ledger and trail balance sheet) |
| 15 | Extension volunteers training | EVs | 16 July, 2001 | Meghraj | 9 | Horticulture in Watershed, Afforestation activity |
| 16 | Agriculture Training | Farmers | 6 Sept, 01 | GAU, Surat | 07 | Cotton cultivation practices- IPM &INP |
| 17 | Extension Volunteers training | EVs | 22 Nov, 2001 | Meghraj | 4 | Quality Control and supervise- Masonry works New watershed treatment activities like farm outlet, gabion etc |
| 18 | SHG | SHG members | 25 Feb, 2002 | Meghraj | 10 | Income generation activities for SHG, |
| 19 | Leadership training- SHG | SHG president and secretary | 21 June, 2002 | Meghraj | 15 | Attributes of good leaders, roles and responsibilities of leaders |
| 20 | Extension volunteers training- refresher | EV's | 28 Nov, 2002 | Meghraj | 6 | Quality monitoring, documentation |
| 21 | SHG | SHG member | 18 th Dec, 2002 | Gokchuvan village | 26 | Awareness on laws of women |

2. Exposure Visit

| No. | Place Visited | Duration | No. of participants | Subjects Covered |
|-----|--|------------------|---------------------|--|
| 1 | Sarathi Organization, Godhar | 15-17 June, 1999 | 47 | Afforestation activities, Joint forest management, watershed treatment, watershed institutions |
| 2 | Aga Khan Rural Support Programme, Netrang BAIF- Dhuva (Vasad) | 27-30 July, 2001 | 40 | Watershed models, ridge to valley treatment, people's participation in watershed, women involvement in execution, joint forest management, VADI project, income generation , nursery raising |
| 3 | Tarun Bharat Sangh, Alwar (Aimi) | 16-17 May 2001 | 10 | Successful Watershed model, people's participation and contribution in watershed |
| 4 | Valuna village, Meghraj (internal exposure visit) | 14 June, 2001 | 35 | Formation of SHG, function of SHG activities |
| 5 | Gayavancharda and Kunol villages, Meghraj (internal exposure visit) | 6 May 2004 | 13 | Watershed implementation activities(farm outlet), need and impact of activity, responsibility of user group, contribution |

3. Entry Point Activities

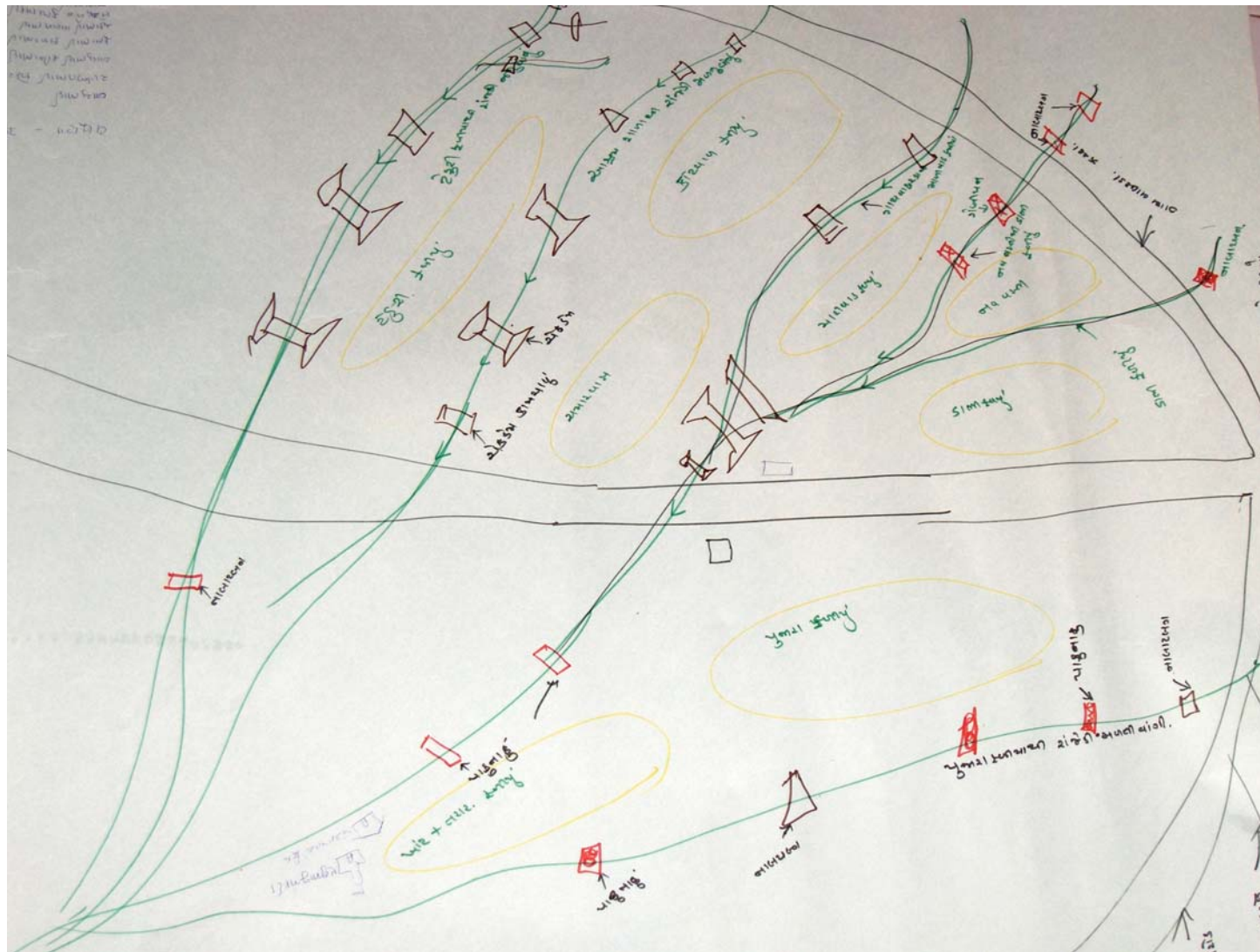
| S. No. | Name of Watershed | Village | Activities | Cost (Rs.) |
|--------|---|------------|---|-----------------|
| 1 | Pragati Jalstrav Vikas Mandal- Bhatkota | Bhatkota | Primary School Room | 49,143 |
| | | Vaniyawada | Primary School compound wire fencing | 21,950 |
| | | Tarakvadia | Drinking water system | 18,658 |
| 2 | Sahyog Jalstrav Vikas mandal, Valuna | Valuna | Community Hall | 99,808 |
| 3 | Sarvodaya Jalstrava Vikas mandal | Modersumba | Primary School compound, wire fencing, chotro | 95,298 |
| 4 | Sitaram Jalstrav Vikas Mandal | Gokchuvan | Primary School room | 63,321 |
| | | Dholvani | Drinking Water borewell and pipeline | 35,073 |
| | | | TOTAL | 3,83,251 |

Annexure 3 List of Village Level Institutions

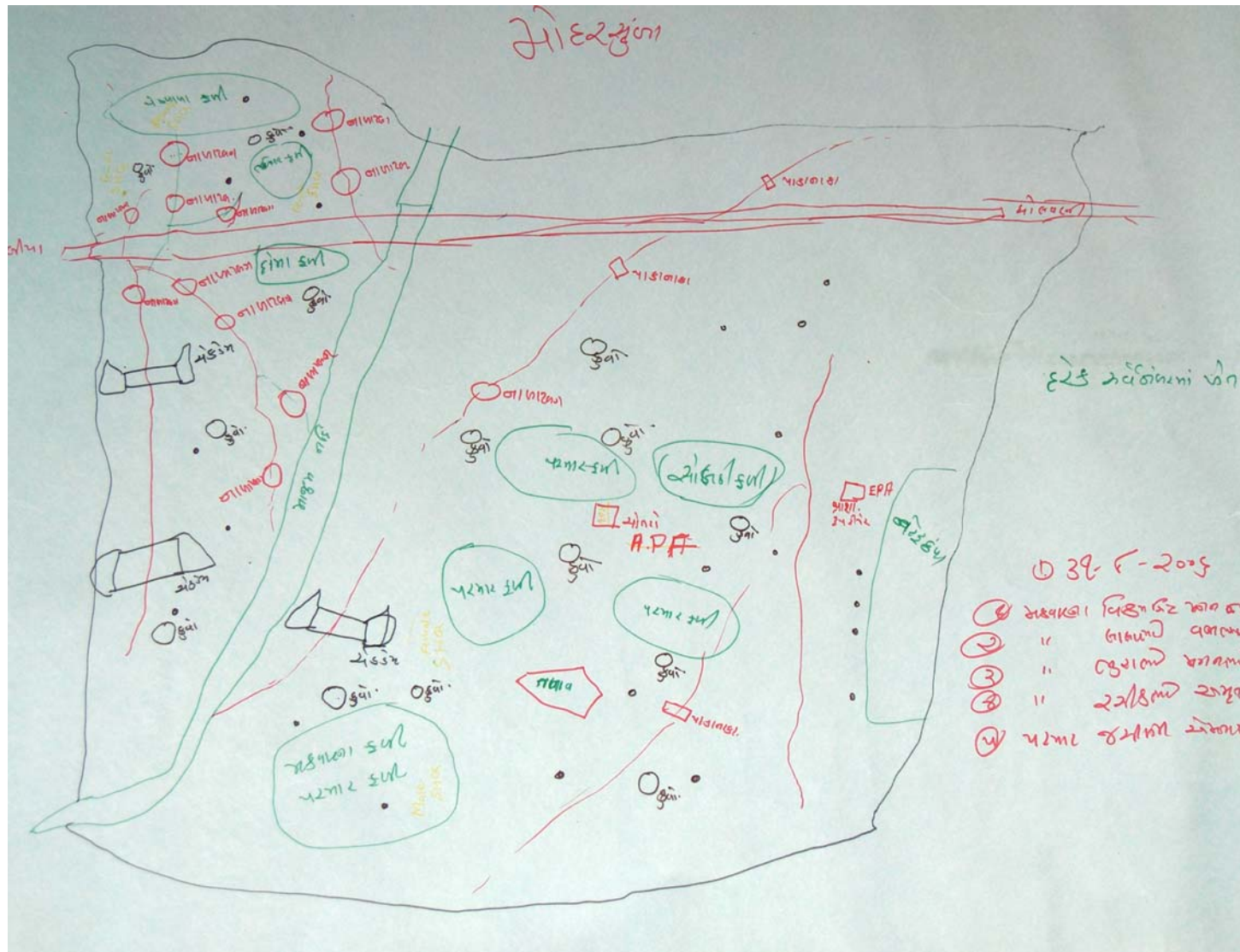
| S. No. | Name of Watershed | Type of Village Institutions | Membership | | |
|--------|--|------------------------------|------------|--------|-------|
| | | | Male | Female | Total |
| 1 | Pragati Jalstrav Vikas Mandal- (Bhatkota, Tarakvadia and Vaniyawada) | WA | 186 | 24 | 210 |
| | | WC | 9+1* | 3 | 13 |
| | | SHG- 10 | 30 | 98 | 128 |
| | | UG -35 | 178 | 1 | 179 |
| 2 | Sahyog Jalstrav Vikas mandal, Valuna | WA | 81 | 16 | 97 |
| | | WC | 8 + 1* | 2 | 11 |
| | | SHG-12 | 55 | 103 | 158 |
| | | UG-29 | 76 | 5 | 81 |
| 3 | Sarvodaya Jalstrava Vikas mandal- Modersumba | WA | 82 | 26 | 108 |
| | | WC | 7 +1* | 3 | 11 |
| | | SHG- 6 | 10 | 70 | 80 |
| | | UG- 18 | 111 | 6 | 117 |
| 4 | Sitaram Jalstrav Vikas Mandal- Gokchuvan, Dholvani | WA | 75 | 14 | 89 |
| | | WC | 8 + 1* | 2 | 11 |
| | | SHG-6 | 20 | 46 | 66 |
| | | UG-9 | 72 | 0 | 72 |
| | TOTAL | WA | 416 | 82 | 498 |
| | | WC | 32+4* | 10 | 46 |
| | | SHG-34 | 125 | 421 | 546 |
| | | UG-91 | 437 | 12 | 449 |

* indicates WDT members

Annexure 4 PRA Exercise in Valuna



Annexure 4 PRA Exercise in Modersumba



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