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Watershed Development in Gujarat

– A problem-oriented survey for the Indo-German Watershed Development Programme –

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Executive Summary

Background

Gujarat is one of the most industrialised states of India. The share of agriculture in the Net State Domestic Product is lower than in most other Indian states. Still, 66 percent of the population live in rural areas, most of them dependent on agriculture to make a living.

Physical and agro-climatic conditions vary from the mountainous areas in the East to the plain lowlands mainly in central and northern Gujarat. More than 90 percent of the annual precipitation falls during the months of June to September. Erratic rains and frequent droughts are the main obstacles to intensive agricultural production. Rainfall varies from an average 340 mm in the district of Kachchh up to 1800 mm in the southern hills. Limited availability of surface water and depleting groundwater resources constrain irrigation possibilities. Soil erosion is another factor, which severely limits agricultural productivity. Forest lands cover only about 10 percent of Gujarat.

Food grains comprise 41 percent of cultivated crops. The major cash crops are cotton and groundnut. Agriculture is predominantly rainfed and even under irrigation the full water requirements of the crops are rarely met. Land holdings are generally small and fragmented and mechanisation is still less.

Livestock husbandry, mainly on degraded areas, suffers from a lack of adequate fodder resources for the large number of animals. Few efforts are made by the villages to improve and regulate the use of common grazing lands. However, Gujarat has a very well developed co-operative milk industry, which is reflected in an increasing overall milk production.

This study has investigated the problem situation in selected villages in Kachchh and Dahod district and looked into the institutional framework of watershed development in Gujarat. Field surveys for the target area analysis were carried out in six villages. In the five priority districts for watershed development activities, 15 NGOs and a number of Government institutions were met and assessed. The study is part of the planning process for the Indo-German Watershed Development Programme (IGWDP) in Gujarat. It is geared towards providing a qualitative description of important issues for a region specific watershed development approach and gives recommendations for possible adaptations of the watershed development approach.

Target area analysis

The target area analysis revealed a large variation concerning the environmental, agricultural and socio-economic situations. Important differences could be observed not only between the two districts where the study took place but also among the villages within individual districts.

Settlement patterns vary and have considerable influence on the communication structures within a village. A lack of possibility or willingness to communicate and cooperate does not necessarily mean hostility among groups. However, conflicts could be observed, both, among and within individual groups.

The role of women depends on the social group they belong to. Most of them, except the Darbar women, participate in field work, while involvement in other economic activities differs from group to group. Women also constitute the most disadvantaged group concerning education. Literacy among elder people is usually lower than among youth, but in both age groups the gender bias prevails. In general, individual sub groups, defined by their cultural or socio-economic characteristics, face a different living situation in the villages and are confronted with different problems.

The common and paramount problems in all villages are water related. Access to existing drinking water sources is ensured for all groups but the efforts required depend on the type and location of sources. The water quality, particularly from open sources, creates health problems. Availability of water for irrigation purposes is very limited, hence, in most cases only one crop is grown per year. Erosion problems and the absence of appropriate cultivation practices further aggravate the problem of low agricultural productivity. Although some forms of wasteland management could be observed, overgrazing is a common problem in the wastelands of all villages.

Economic activities other than agriculture are limited in the villages. Even the selling of animals and of surplus production, i.e. milk and milk products, sometimes faces problems. Daily labour is the other important source of income. Very few villagers are engaged in specialised professions. Some women are successfully engaged in handicraft related activities.

Migration can be observed in all villages. People leave temporarily or permanently to find employment in other rural or urban areas. Many people migrate between the cropping seasons due to a lack of

employment opportunities within or near their villages. Remittances play an important role for the village economies.

Institutional analysis

In answer to the problem of natural resource degradation, more than 1200 watershed development projects have been implemented under different programmes by the Rural Development Department in Gujarat since 1995. More than 70 percent of these are operated by NGOs. All government funded watershed development projects in Gujarat follow common guidelines, which determine implementation strategies, programme content and components, principles of project management, capacity building, financial aspects and monitoring and evaluation. Major aspects of the approach include sustainability, participation, empowerment and decentralisation.

In general, the spirit of the common guidelines must be considered to be appropriate. However, as nation wide guidelines, they lack considerations of regional characteristics and problems. More flexibility would be required in many aspects to ensure appropriate handling of local problems. As an integrated, but, basically land based approach, watershed development needs careful consideration of equity concerns. Soil and water conservation measures alone might otherwise further benefit the rich instead of fostering social and economic cohesion.

Implementation problems also arise from cooperation difficulties among different GOs and NGOs. The treatment of forest lands and common property resources, as required in most cases when following the *ridge to valley* approach, faces many difficulties. For the last years the emerging Joint Forest Management Programme (JFM) has been trying to mitigate some of those problems. Meanwhile it is the largest programme of the Forestry Department. In addition to JFM, there are other government programmes, which are supplementary to and supportive of watershed development efforts.

The status of NGOs in Gujarat is very strong. Many of them have been involved in watershed development related activities for a number of years already. They actively participate in policy dialogues with the Government and are a driving force in pursuing adaptation of the watershed development approach. Many of the NGOs have developed special implementation strategies, often depending on their specific field of interest or the background of their organisation and staff. Other NGOs are implementing regionally adapted solutions based, for example, on the problem of salinity in coastal areas.

In 1999, the National Bank for Agriculture and Rural Development (NABARD) joined the watershed development efforts by establishing its Watershed Development Fund. The fund aims at further strengthening participatory watershed development initiatives. The selection criteria for watersheds are a significant proportion of Scheduled Castes/Scheduled Tribes (SC/ST) population, high extent of rainfed farming and a high potential for watershed development. The regional watershed management cell of NABARD, which took up work in August 1999, is planning to undertake 19 projects at the first stage. Number and staff composition will have to widen, when the programme expands.

Successful project implementation demands a range of skills and attitudes at village, NGO and programme management level, which are not always or not sufficiently developed. Capacity building, therefore, plays a central role. Requirements at village level include raising awareness for environmental problems and resource management. Additional training will be required in order to make best sustainable use of conserved resources. Many NGOs in Gujarat have been successfully involved in watershed development projects. They have gained ample experience with this approach. What is still needed in some cases is to balance any existing bias in their work, which in many cases is either on the social or on the technical side. However, capacity building for the proposed IGWDP in these respects will probably not require the establishment of a separate institution. There are well established networks, which take care also of capacity building requirements. Requirements at the management level will mainly comprise comprehensive supervisory and monitoring functions.

Further conclusions

Based on the institutional analysis, different implementation arrangements for the IGWDP in Gujarat appear to be feasible. NABARD may play the central role, managing the programme alone. All major functions, like selecting project implementing agencies (PIAs), coordination and monitoring tasks, technical and managerial backstopping would be concentrated within NABARD. Apart from the advantage of having a very clear line in decision-making, such an arrangement would probably neglect the opportunities associated with a more specialised labour division.

Having an external agency, which takes over the tasks in which NABARD does not have a comparative advantage, would at least partly take

account of the deficiencies in the first proposal. Apart from the financial management, probably a wide range of tasks could be handed over to an experienced organisation, which would have well established contacts with many potential PIAs. A third possibility could be to delegate tasks to regional (district) networks of institutions (PIAs). Such an arrangement could take advantage of the knowledge of institutions on the specific situation in the regions where they already operate. As natural and socio-economic conditions vary a lot among regions, taking maximum advantage of regional experiences for planning, implementation and management seems advisable.

Successful programme implementation will also depend on the selection of watersheds. Prime criterion for the selection of the region for intervention should be the severity of natural resource degradation. Within the defined region, poverty alleviation concerns should guide the selection of watersheds. A strong community sense is a precondition for successful project implementation. Although building up such a community sense might be time consuming, it is the important starting point for any further activities. If the project fails already at this first step, no further activities should follow.

Adapting the watershed development approach to regional conditions in Gujarat will have to take place in different ways. The guidelines for the proposed IGWD will have to take into consideration the diversity of the State in terms of its natural and agro-climatic conditions, and also in terms of the regionalisation of potential PIA structures. The broad range of problems persistent in a village calls for a multidisciplinary watershed development team with at least one female member. Development activities should not be confined to the watershed development area of a village; the village should benefit as a whole, if necessary by implementing watershed development projects in more than a single watershed within a village.

The development of common property resources could provide an opportunity to have the landless benefit from the project not only through additional possibilities for labour work but also through the distribution of user rights on these resources. This possibility should be pursued wherever possible. At the same time, the introduction of commonly accepted range management regulations could help to keep this development sustainable.

In general, it is necessary to develop and adapt communication procedures and conflict resolution strategies, which take account of all villagers and their different situations and objectives.

No matter which overall watershed development approach is adopted for Gujarat, there are a number of policy issues, which require attention. A large part of the problem, which now calls for watershed development, is caused by subsidising the extraction of groundwater. The same organisations, which manage watershed development programmes can at least partly, also be held responsible for the current water problems. Instead of subsidising water use, sustainable and efficient use could be better achieved by putting a price on this scarce resource.

All development activities, and in particular the water related ones, which take place in watershed development, should be embedded in an overall land-use planning system. Water problems are a state-wide phenomena in Gujarat. Efforts to preserve water and to make best use of it should be planned and coordinated at the state level.

Abbreviations

AKRSP	Aga Khan Rural Support Programme
ASA	Action for Social Advancement
BAIF	Bhartiya Agro-Industry Foundation
BPL	Below Poverty Line
CAPART	Council for Advancement of Peoples Action and Rural Technology
CATAD	Centre for Advanced Training in Agricultural and Rural Development
CEC	Commission of European Community
DDP	Desert Development Programme
DFID	British Department for International Development
DFO	Divisional Forest Officer
DPAP	Drought Prone Area Programme
DRDA	District Rural Development Authority
DSC	Development Support Centre
EAS	Employment Assurance Scheme
GAU	Gujarat Agriculture University
GDP	Gross Domestic Product
GEB	Gujarat Electricity Board
GIDR	Gujarat Institute of Development Research
GO	Government Organisation
GSLDC	Gujarat State Land Development Corporation
GVT	Grameen Vikas Trust
ha	Hectare
IGWDP	Indo-German Watershed Development Programme
IRDP	Integrated Rural Development Programme
IRMA	Institute of Rural Management
IWDP	Integrated Wasteland Development Programme
JBIC	Japanese Bank Integrated Corporation
JFM	Joint Forest Management
KfW	Kreditanstalt fuer Wiederaufbau (German Development Bank)
kg	Kilogramme
mm	Millimetre
MoA	Ministry of Agriculture
MoEF	Ministry of Environment and Forests
MoRD	Ministry of Rural Development
NABARD	National Bank for Agriculture and Rural Development
NGO	Non-Governmental Organisation
NPK	Nitrogen-Phosphate-Potassium
NRM	Natural Resource Management
NSDP	Net State Domestic Product

NWDPRA	National Watershed Development Programme for Rainfed Areas
PIA	Project Implementing Agency
PIM	Participatory Irrigation Management
PRA	Participatory Rural Appraisal
RRA	Rapid Rural Appraisal
Rs	Indian Rupees
SC	Scheduled Castes
SGSY	Swarnjayanti Gram Swarojgar Yojana
SHG	Self Help Group
SIRD	State Institute of Rural Development
sq. km.	Square kilometre
SSI	Small Scale Industry
ST	Scheduled Tribes
USD	US Dollar
VRTI	Vivekanand Research and Training Institute
WD	Watershed development
WDF	Watershed Development Fund
WDP	Watershed Development Programme
WDSCA	Watershed Development Programme in Shifting Cultivation Areas
WDT	Watershed Development Team
WREMI	Water Resource Engineering and Management Institute

1 crore	= 10 Million
1 lakh	= 0.1 Million
1 foot	= 0.305 metres
1 metre	= 3.281 feet

Glossary

Adivasi	Indigenous (tribal) people, having different communities such as Bhil, Damor, Chaudhary, Gamit, Rathwa, Vasava etc.
Bajra	Millet
Caste	Social group within the Indian caste society.
Chullah	Oven or kitchen, also used to define a household.
Ghee	Dairy product, like clarified butter.
Gram	Village
Gram Sabha	Village assembly
Gram Sevak	A government employee responsible for agriculture extension at village level.
Jowar	Sorghum
Kacha	Unfinished, built without strong construction materials.
Kharif	Summer season
Krishi Vigyan Kendras	Agricultural Science Centres set up by the Indian Council of Agricultural Research and Agricultural Universities to spread farmer based extension messages to the villages.
Mava	Sweet, made by condensing milk and adding sugar.
Nala	Small water carrying structures.
Panchayat	Decentralisation of power to local level.

Panchayat Raj	Local bodies of elected people at village, block or district level representing the political administrative power.
Pucca	Structure built by using strong materials.
Rabi	Winter season
Sarpanch	Elected head of the village panchayat.
Scheduled Castes	List of socially disadvantaged castes who were considered untouchables in the past.
Scheduled Tribes	List of marginalised indigenous (tribal) people, comprising of different ethnic sub groups such as Bhil, Damor, Chaudry, Gamit, Rathwa, Vasava etc.
Swarnjayanti Gram Swarojgar Yojana	A comprehensive group based self-employ-ment scheme of the Rural Development Department.
Talati	The secretary of the village panchayat, responsible for collection of revenues and other administrative work.
Taluka	Block, political administrative unit between village and district level.

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1 Introduction

The following study was commissioned as part of the planning process to extend the coverage of the Indo-German Watershed Development Programme (IGWDP) to the state of Gujarat. In 1995 the National Bank for Agriculture and Rural Development (NABARD) prepared a plan for a watershed development programme in Gujarat, based on the successful IGWD pattern. The Government of Gujarat requested NABARD to take up the programme and NABARD, which is involved in the IGWDP since 1992, approached the German Kreditanstalt fuer Wiederaufbau (KfW) for financial assistance.

Following the good experience with the grant based watershed development programme for soil and water conservation in the state of Maharashtra the proposal was forwarded for closer scrutiny and a preliminary approval was given to grant funding.

Due to political reasons the sanctioning process of the project came to a standstill for three years and was picked up again only in 1999. It was decided that funding could be provided to NABARD following the patterns of similar financial cooperation projects in other states.

In order to adapt the implementation procedures to the regional specifications of Gujarat, a pre-feasibility study, focusing on a problem-oriented description of the institutional environment and the intended target area was carried out. The task was commissioned to the Centre for Advanced Training in Agricultural and Rural Development (CATAD). This publication is the result of the research undertaken by CATAD.

A full-fledged feasibility and planning study will be carried out before final approval of the programme.

The main readers of this study will probably be the people concerned with watershed development in Gujarat. The content of this report, however, renders itself to wider scope and usage. The description of the situation in certain villages, the problem analysis and the types of interventions described can be of use before beginning to plan different programme and project activities, either in the field of natural resource management or in other related areas. In particular, certain points mentioned in the report will also be helpful in assessing different approaches adopted by different institutions for watershed development.

The study consists of six main parts:

- A brief description of the state of Gujarat: Important background information for the readers not familiar with the area. The chapter focuses on relevant information in the field of natural resource management.
- A description of the concept and methodologies applied in conducting the research: The chapter provides the research framework and the background of the study.
- A description and assessment of the main actors, government institutions and NGOs, and their respective activities in watershed development.
- A description of the target group and a problem analysis based on surveys in six villages in two different districts in Gujarat: The chapter describes the situation in the villages and analyses the main problems, which intended project interventions would address.
- An assessment of capacity building requirements at different levels and a description of capacity building institutions in Gujarat.
- The last chapter explains the crucial points for planning interventions particularly in the field of natural resource management. The chapter highlights the main issues, which have to be taken into consideration in planning and implementing the expected watershed development programme.

Individual chapters are mainly self-contained and can be read separately form each other. Additional background information can be found in the material provided in the Annexes.

Naturally, the study cannot provide a comprehensive picture on all issues related to natural resource management in Gujarat, nor should the content be understood as a textbook on socio-economic problems in rural Gujarat. However, the content has been carefully compiled to give an insight into the nature of watershed development efforts, actors, activities and challenges. It also provides a situational analysis of the target area.

2 The Programme Area

2.1 The State of Gujarat

2.1.1 Physical characteristics

The state of Gujarat is situated on the western side of India covering an area of 196,024 sq. km. It accounts for about six percent of the total geographical area of India and five percent of the population. Almost one third of the coastline of the Indian sub-continent belongs to Gujarat. 34 percent of the 41.13 million people live in urban and semi-urban areas uniformly spread throughout Gujarat. The population density ranges from 397 per sq. km in Central Gujarat to only 27 persons per sq. km in Kachchh (DIRECTOR OF CENSUS OPERATIONS, 1992, p. 12).

Map 1: The administrative divisions of the State of Gujarat

(Map source: Centre for Monitoring Indian Economy, monthly bulletin, August 2000, Gujarat State)

The state can be broadly divided into South, Central, North and Saurashtra-Kachchh regions. Vast areas of the state, mainly in the central and northern Gujarat, are plain lowlands. Mountainous areas are seen in the fringe of the eastern part, where the border is shared with Maharashtra, Madhya Pradesh and Rajasthan. In contrast, some parts of the Gulf of Khambhat are below mean sea level (MSL) (ARPU, 1998, pp 38-39). Even the hydrogeology and surface structures show large variations. Thus, the northern and western parts of the state have more rocky terrain but the central and southern regions hold soft alluvial soil on the surface. Finally, the coastal parts of Kachchh and Saurashtra have limestone and related sedimentary deposits. There are no perennial rivers flowing through the major parts of the state like North Gujarat, Kachchh and Saurashtra. (IRMA, 1999, p.10).

The soil types also vary between the different regions of Gujarat (ARPU 1998, p. 39). In South Gujarat, medium deep black and alluvial soils are predominant. Medium black soil is prevalent in Central Gujarat; the Saurashtra peninsula has calcareous medium black to coastal alluvial soils. Finally, in the north and north-west, grey brown and coastal alluvial soil is predominant.

Gujarat has a tropical monsoon climate. 90 to 95 percent of the total annual rainfall is seen during the period form June to September, when the south-west monsoon prevails (FERGUSON, n.d. b). But the level of rainfall varies from about 340 mm in the district of Kachchh to about 1800 mm in the southern hills of Dangs and Bulsar. On an average, however, the main parts receive rainfall of about 800 mm. Nearly 20 percent of the area in 19 districts of the state is considered as drought prone (ARPU, 1998, p. 39).

Only 52 percent of the total geographical area of Gujarat is used for agricultural purposes. More than 23 percent of the land is wasteland of which more than 85 percent is located in Kachchh. About 17 percent of the area supports waterbodies and 3 percent is under dense forest cover (IRMA, 1999, p. 10) although 10 percent is defined as forest land (ARPU, 1998, p. 39). Of the total wasteland 19 percent is salt affected, 1.5 percent is water-logged and about 11 percent is barren and stony land. (IRMA; 1999, p. 13)

"Water resources in Gujarat are concentrated primarily in the southern and central part of the mainland. Saurashtra and Kutch in the northern mainland, with exceptionally high irrigation needs, have limited surface and groundwater resources.

Groundwater and surface water are the two different sources from which water is utilised for irrigation purposes. These two sources are mainly replenished by rainfall and stream flows." (FERGUSON, n.d. b)

2.1.2 Socio-economic and political situation

Selected socio-economic features

Gujarat is the second most industrialised state of India[1]. The main industries are located in the "Golden Corridor", the area along the main highway and railway line from Ahmedabad, moving south, towards Mumbai. Major industries include chemical companies, rubber, plastic, petroleum factories, electrical and textile plants. The high extent of urbanisation (35 percent) also indicates a scope for development in the service sector, which already accounts for 42 percent of Net State Domestic Product (NSDP). Industries and the service sector also provide major temporary employment opportunities for seasonal (migrant) labourers. Annual overall growth rates in the state economy of approximately 8 percent per year since 1991 can mainly be attributed to the increase in the secondary and the tertiary sectors. Yearly growth rates in agriculture have only been at around 4 percent.

Agriculture, forestry and fishing related processing enterprises provide employment to an estimated 1.1 million people (GOVERNMENT OF GUJARAT, 2000a). More than half of these people work in their own family enterprises in the tiny sector, providing employment only to up to two people. Annual growth rate of these enterprises has been 6.9 percent; only the few larger ones are growing faster by 14.5 percent (1990-98), in urban areas. Only 40,000 people find employment in larger scale enterprises with 6 or more workers (GOVERNMENT OF GUJARAT, 2000a). Hence, there still seems to be a large and unexploited potential for agro-based industries, an area, which the Government is slowly selecting for promotion and support.
The share of agricultural production in the NSDP of the State is only 21 percent, down from over 30 percent ten years ago. This figure is lower than the Indian average of 26 percent. Farming is nevertheless still the mainstay in rural areas. Latest reports indicate that the employment figure for the rural population is 52 percent as compared to those of urban population, which is 35 percent. In rural areas, self-employed population (32 percent) is found to be more than that of urban population (14 percent). 27 percent of the rural population is engaged as casual/contract labourers (GOVERNMENT OF GUJARAT, 2000b).

[1] Gujarat ranks second in terms of industrial investment projects under implementation and second in regard to net value added by the manufacturing sector (Socio-Economic Review, Gujarat State, 1999-2000).

However, hardly any farming family can survive without the significant income derived from seasonal migration or from remittances[2]. These figures for the share of agriculture in labour absorption probably provide a misleading picture as compared to the realities on the ground. Following our own observations, seasonal migration from rural areas may include up to 80 percent of the respective village population. However, there is a large variation from district to district and from village to village, based mainly on the economic opportunities available.

Literacy rate is 61 percent with a distinctively lower figure of 36 percent among scheduled tribes, which form a major part of the target population in the envisaged programme area. Still, these figures are far above the Indian average, which are 52 percent and 29 percent respectively (DIRECTOR OF CENSUS OPERATIONS, 1991 figures). A major distinction remains between literacy amongst men and women. Female literacy rate is only 57 percent while literacy rate for men is 80 percent.

Per capita income in 1997/98 was Rs 17,000 (app. USD 400) almost one third above the Indian average of Rs 13,000 (app. USD 310). Still, about a quarter of all families in Gujarat live below the poverty line while the Indian average is 35 percent (GOVERNMENT OF GUJARAT, 2000c).

There are a number of programmes aimed at uplifting the economic situation of backward classes, mainly the scheduled castes and tribes[3]. Special programmes and subsidy schemes are financed and implemented partly by the Central and partly by the State Governments. Funding for different programmes and schemes has not been a major problem in recent years. However, rural development initiatives have been restructured in 1999 and are now managed under a comprehensive programme called Swarnjayanti Gram Swarojgar Yojana (SGSY)[4].

Rural development related administration

Gujarat is divided into 25 districts, comprising 225 blocks (*talukas*), with a total of 18,028 villages. Administration has a two-tier structure from the central down to the village level (see Figure 1). There is the Panchayat Raj System, which consists of elected representatives at the district (*zilla parishad*), block (*panchayat samiti*) and village levels (*gram panchayat*). There might be one or several villages sharing a

2 Except for irrigated areas where intensive farming practices have been adapted.
3 For explanation see Glossary.
4 For more details see Glossary.

single (village) panchayat. One third of the seats in the panchayats is reserved for women.
The system is supposed to give people decision power, particularly on developmental issues. However, as mainly a political and party influenced system, the panchayats are prone to the well-known problems of politicised administration.

The panchayat system exists side-by-side with the public administration system. The latter is still as structured as it used to be during pre-independence days, although actual duties have partly changed or have been widened. The highest civil servant representative at the district level is the collector who directly reports to the revenue department at the state level. Outside urban centres, the District Rural Development Authority (DRDA), whose director is supposed to coordinate rural development activities and liaise with the district panchayats, handles developmental matters. The DRDA has representatives at the block and at the village levels also. This staff is supposed to support implementation of different schemes and bring up matters to the district level. There are various extension officer based at the block level, who are responsible for different subject matters. Lowest in line are the village level workers. The *gram sevak*, also an extension worker, who is supposed to take care of up to 10 villages is hardly found in many villages. The *talati* is the lowest level functionary of the revenue department. He is responsible for the village records and revenues. His presence in the village is more secured than that of extension workers.

Figure 1: Panchayat Raj System

The frequently observed physical vicinity of both the administrative structures[5] hinders, in many cases, a transparent and democratically controlled decision-making and use of development funds. There are many complaints of corruption, misuse of funds and preferential treatment of villages and hamlets with stronger political linkages and influence[6]. There is at the moment a movement towards further strengthening the panchayat system, particularly in the areas dominated by tribal population, and allowing development programmes, for instance, to be implemented through the panchayats only[7]. While the proposed changes aim at giving the elected bodies more power and control over the use of financial resources, there are doubts as to whether the panchayats are equipped for such a task. Already, there are difficulties in the management of on-going projects and inadequate representation particularly in remote and scattered villages.

2.1.3 Priority areas

In view of the limited funds available, the Government in accordance with proposals of NABARD has determined five priority districts for

5 At block and village level they often share the same buildings or even offices.
6 During field surveys we heard numerous such complaints.
7 The matter has been taken up to the constitutional level in the heavily criticised 73rd (and 74th) Amendment of the Constitution, following the Bhuriya Committee Report, which criticised a number of arrangements concerning decision making procedures in the Panchayat Raj System.

watershed development under the expected Indo-German cooperation scheme for Gujarat. The five districts are Bharuch, Bhavnagar, Dahod, Kachchh and Sabarkantha. Activities under the programme are expected to have a pilot character for later replication to other districts in Gujarat.

The common features of these districts are the high incidence of poverty and the severity of soil and water related problems. The share of scheduled castes and scheduled tribes (SC/ST) is in most cases considerably higher here than in other districts (DIRECTORATE OF ECONOMICS AND STATISTICS, 2000). SC/ST are considered backward classes and enjoy priority in development activities. The presence of experienced and dedicated NGOs in the proposed priority districts is expected to facilitate project implementation.

All the five districts have a high potential for undertaking watershed development projects. Although, there are considerable differences within individual districts and among different districts, on-going watershed development activities under other programmes indicate that the selected districts are highly suitable for such a programme. A closer description of Kachchh and Dahod districts, including an assessment of problems and potentials, can be found in chapter 5. These two districts were chosen for the survey in order to cover two extreme districts in Gujarat in terms of the above mentioned criteria.

2.2 Role of agriculture, livestock husbandry and forestry

2.2.1 Agriculture

The contribution of the agricultural sector in the state gross domestic product (GDP), which was 48 percent in 1971, declined to 21 percent in 1997/98. However, 57 percent of labourers are engaged in agricultural activities (NABARD, 2000a, p. 2).

The average land holding size in Gujarat has been declining continuously over the years, from 3.15 ha in 1986 to 2.93 ha in 1991 (NABARD, 2000a, p. 2). The average size of holdings varies from 5.06 ha in the arid north-west (Kachchh) to 1.76 ha in the Southern Hills (Dangs and Valsad). About 50 percent of the farm families are small farmers, holding land up to two hectares. Approximately 33 percent of the farmers, hold land between two and five hectares. The number of holdings has increased from 2.43 million to 3.52 million between 1971 and 1991. The land holdings are fragmented, which implies that farm

mechanisation is difficult. The level of subsistence farming is high (FERGUSON, n.d. a, p. 3).

Out of the total cropped area, 41 percent are under food grains. These are: pearl millet (*Pennisetum glaucum*), sorghum (*Sorghum bicolor*), paddy (*Oryza sativa*), maize (*Zea mays*) wheat (*Triticum ssp.*) and different types of pulses. 18 percent of the total cropped area is under oilseeds like groundnut (*Arachis hypogaea*), and castor (*Ricinus communis*), 14 percent is cultivated for cotton (*Gossypium herbaceum*), 2 percent for sugarcane (*Saccharum officinarum*), 1 percent for tobacco (*Nicotiana tabacum*) and the area cultivated for other crops is 24 percent. These figures signify the importance of non-foodgrain crops in the agricultural produce of Gujarat (NABARD, 1998, p. 4; FERGUSON, n.d. a, p. 2). Groundnut and cotton are the main cash crops (ARPU, 1998, p. 44).

The fertiliser consumption was about 70 kg/ha in 1997. Since 1995, the consumption has increased at an annual rate of 5.6 percent (ARPU, 1998, p. 40). The Nitrogen-Phosphate-Potassium (NPK) ratio, however, is imbalanced, since comparatively too much nitrogen is applied (NABARD, 2000a, p. 3). The reason for this imbalance is that urea is easily available here and is comparatively cheaper (JOSHI, 2000, p. 68). Nearly 70 percent of the agricultural area in Gujarat is under rainfed cultivation (NABARD, 1998, p. 4). It is worth noting that even if crops are irrigated, the full irrigation requirement of the cultivated crops is generally not met. It is estimated, that not more than 60 to 70 percent of the on-farm irrigation requirements are effectively provided in most cases. Thus water is an important limiting factor to achievement of potential yields (FERGUSON, n.d. b). The degradation and, consequently, poor fertility of the cultivated land is another important reason for low production and low productivity of the cultivated crops (NABARD, 1998, p. 4).

2.2.2 Livestock husbandry

Livestock activities contribute about five percent to GDP besides providing rural employment directly as well as indirectly (JOSHI, 2000, pp. 111, 194). The total livestock in Gujarat was about 19.6 million in 1992, and had increased between 1982 and 1992 by 1.26 million animals, particularly with respect to the number of buffaloes, goats and sheep. The total livestock comprises 35 percent cattle, 27 percent buffaloes, 10 percent sheep, 22 percent goats and 6 percent of other animals.

The production of milk was about 3.89 million tonnes in 1994, which showed an increase of about 80 percent over milk production in 1981 (ARPU, 1998, p. 45). Gujarat is the pioneer in dairy development and the co-operative milk industry is well developed here. The productivity of animals, however, needs to be improved through better breeding, feeding and health (JOSHI, 2000, p. 114, 194).

The area of pastures and grasslands is 0.07 ha per animal. The area under fodder crops is 0.09 ha per animal; the required norm, however, is 0.4 ha per animal. Thus, the area is grossly inadequate. Consequently, fodder shortage is a persistent problem (JOSHI, 2000, pp. 111, 115, 201). About 4 percent of the total geographical area of Gujarat is officially marked as permanent pasture and other grazing land, 94 percent of this pasture and grazing land is considered as degraded area (RURAL DEVELOPMENT DEPARTMENT, n.d., p. 7).

Most of the farmers do not maintain any grassland in their holding and the provision to assure availability of dry fodder is not seen in the cropping system. A common grassland is to be maintained by the village panchayat but very few sincere efforts are made by the village body in this direction. For landless livestock owners the common grasslands are an important basis in order to make a living. Due to the poor conditions of grasslands, the landless livestock owners cut green branches of trees and leave them defoliated. As the grasslands cannot meet the needs of livestock and as the availability of trees and fodder gets reduced in rural areas, there is migration of animals. In the course of migration the livestock owners heavily prune the roadside trees that are grown at high cost (JOSHI, 2000, pp. 187-188).

2.2.3 Forestry

The forest land in Gujarat extends over 1.88 million ha, which is about 10 percent of the total geographical area of the State (DIRECTORATE OF ECONOMICS AND STATISTICS, 2000, p. xiii). This is below the international norm of about 33 percent[8] and below the Indian average of 22 percent (JOSHI, 2000, p. 17).
The major part of the forest area is in Surat, Panch Mahals, Junagadh, Bharuch and Valsad districts. With 26 percent of area classified as forest, Panch Mahals has the highest proportion of forest land in Gujarat (SARIN et al., 1996, p. 4).

Most of the forests are dry, deciduous to shrub type, with very low productivity. About one third of the total forest area of Gujarat is

[8] This norm is required in order to maintain the ecological balance.

degraded (DIRECTORATE OF ECONOMICS AND STATISTICS, 2000, p. xiv). As a consequence, the firewood needs of Gujarat remain unsatisfied to a large extent. In rural areas, at least one member of each household spends nearly half of the working time in the collection of firewood (JOSHI, 2000, p. 17).

The main reasons that have lead to destruction of the forests are rampant commercial exploitation, clearing forests for agriculture or the submergence of large forest tracts by irrigation or hydro-electric projects. Other important reasons are unauthorised settlement on forest land and the increasing pressure of human and cattle population (SARIN et al., 1996, p. 5).

Out of the total forest land, about 73 percent is reserved, 2 percent is protected and 25 percent is unclassed forest type (DIRECTORATE OF ECONOMICS AND STATISTICS, 1998, p. 121). A reserved forest area means that local people have no right over the forest, and there are penalties for unauthorised extraction (SARIN et al., 1996, p. 5). The forests are used for products like fuel wood, round wood, sawn wood, bamboo, grass and grazing, gum, leaves, oil seeds, drugs and edible products. Action has often been taken by the government within the scope of forest development in Gujarat. These include, among other things road side plantations, teak and bamboo plantations, fuel wood plantation, soil and moisture conservation and afforestation on denuded areas as well as on desert borders (see chapter 4.2.4) (DIRECTORATE OF ECONOMICS AND STATISTICS, 1998, pp. 122, 124).

2.3 Type and extent of soil and water degradation

Gujarat is affected by different types of soil and water degradation to various extent. This is due to salinity and pollution of water and soil, decline in water resources and erosion of the land surface.

Decline of the groundwater resources

In terms of groundwater resources, Gujarat can be divided into three parts: Gujarat mainland, Saurashtra region and Kachchh. In the Gujarat mainland, the water levels have declined in all water bearing units. This decline has taken place mainly in the alluvial sub-aquifer. In the period 1982 to 1991, the water level decreased by approximately 40 to 60 metres. This indicates over-pumping of this sub-aquifer.

The situation is similar in the Saurashtra region. In the decade 1982 to 1991, the fall in the groundwater table was 0 to 4 metres. This ratio varied considerably (up to several tens of metres) at various places. Again the reason is an overuse of the resources.

The situation in Kachchh cannot be described in detail because the exact extent of the aquifer is not known. But it can be assumed that the aquifers are combined hydraulically from one aquifer (FERGUSON, n.d. b). The decline in this area has been 35 to 40 metres over the past three decades (VIKSAT 1999, pp 4-7).

The problem of over exploitation of groundwater resources is recorded in many parts, particularly in southern Gujarat. "During the past two decades in particular, the water levels in several parts of the country have been falling very rapidly due to ever increasing private extraction for domestic, agricultural and industrial uses in addition to the government sponsored extraction for meeting requirements of the piped water supply schemes of urban centres and development oriented schemes" (VIKSAT 1999, p. 4).

Groundwater and soil pollution

The process of salinity of soils and saline ingress due to groundwater resources is a major source of degradation. Especially in coastal areas, most of the soil is salt affected because of sea water intrusion and use of deeper saline aquifers for irrigation purpose in agriculture. For example in Kachchh, 98 percent of the soil in the coastal area is identified as saline and most of the aquifers are slightly to heavily saline. (IRMA, 1999, p. 12). The total area specified as affected by salinity is about 12,000 sq. km. The causes for salinity can be classified as natural and man-made.

The natural causes are:

- Inherent salinity, found in areas which have remained under the sea for a long time. Soil is also made saline by saline water tables.
- Salinity caused by tides affecting estuaries.
- Low lying marshy lands inundated by high tides.
- Salt and sea water laden winds of high velocity, which affect the soil and surface water up to 15-20 km inland.

The man made causes are:

- Over exploitation of groundwater causing decrease in its level. Because of this, the ingress of saline water into the aquifers and the soil increases. The rate of the ingress is 0.5 km per year to the inland.
- Irrigation with saline groundwater.

In addition to all the above mentioned reasons, one must note that the long coastline of Gujarat renders a tremendous influence on the land and water resources (FERGUSON, n.d. b).

Also pollutants are on the rise in Gujarat due to over exploitation of groundwater. High levels of fluoride, for example, make the groundwater in at least 360 villages of Mehsana district unsuitable for drinking purposes (VIKSAT, 1999, p. 7).

Degradation of surface water resources

Large quantities of rainwater flow directly into the sea. Due to the unpredictable nature of the stream, harnessing and utilisation of this water is difficult.
Accumulation of sediments in reservoirs and other structures causes different problems like depletion of the storage capacity, higher losses by evaporation and spills as well as a reduction of infiltration. Induced recharge of the groundwater is seen because these sediments consist of the soils eroded by the heavy rainfalls during the monsoon season (FERGUSON, n.d. b).

Soil erosion

Wide open wastelands, deforested areas and fields without any vegetation are subjected to wind and water erosion. The only data quantifying the expansion of soil erosion says that in Gujarat, 3,900,000 ha is wasteland (FERGUSON, n.d. a, p. 7). It is described as unproductive and saline. Erosion or indications for erosion were observed by the research team in all the parts of Gujarat that they visited. Furthermore WD treated areas with structures like gully plugs and *nala* plugs indicate an erosion problem in the past. Degradation of the soil down to the bedrock or massive gullies developed within a few years, depending on slope and/or surface, was observed in Kachchh and Dahod.

Water logging

Another problem caused by over-irrigation and/or unsuitable drainage of the irrigation water, is water-logging. It is mainly found in areas under the use of the canal irrigation technique. If the water table rises up to the root zone, the land is rendered unfit for cultivation. This is due to a lack of an effective drainage system and over-irrigation.
15 percent of the canal irrigated area is reportedly affected by water-logging and another 24 percent is estimated to be moving towards this situation.

Reasons and impact of soil and water degradation

"...there has been an ever-increasing extraction of the groundwater resource for a range of purposes by the key users, viz., the government and non-governmental ‘stakeholders’ as if it were never-ending nectar. This chasing of the ground water led to serious imbalances in ground water development, affecting the hydrologic cycle." (VIKSAT, 1999, p. 2)

To ensure the basic supply to the fast growing population of Gujarat the pressure on existing resources is ever increasing. Because of the urgency of the situation at first, all conventional measures are undertaken without consideration of any negative long-term effects (see figure 2), neither on the environment, nor on society, in terms of impoverishment.
At first, a lack in the basic supply affects the poorer parts of society. These people usually try to compensate this lack by exploiting the resources located within their reach. This leads to depletion and, consequently, to the deterioration of the environment. After some time the basic supply is no longer ensured through the given resources in these areas. Hence, people have to look for additional sources of income. Parts of society migrate permanently or seasonally to the urban areas, leaving their property uncared-for. As a result, some of the of land becomes fallow. The pressure on the remaining resources increases and leads to their faster deterioration. Without any support from outside, there is a rapid impoverishment of the rural societies. Again the pressure on resources intensifies. At this point the circle of resource degradation and impoverishment becomes a downward spiral.

To break this circle, a sustainable use of the given resources is required. The watershed development approach might be able to slow down the development of this spiral. Furthermore, unused potentials of natural resources might open up and form the base for a sustainable economic growth.

Figure 2: Watershed development as a strategy to combat the causes of natural resource degradation

3 Research Framework and Methodology

3.1 Objectives of the study

This study aims to be of assistance to the Indo-German Watershed Development Programme. The objective of the research was, that KfW and NABARD use this report in order to adapt their watershed development concept, to the regionally specific conditions of Gujarat.

At present KfW and NABARD have an existing information gap, in the sense that relevant pieces of information are missing and the existing data is not available in an action oriented and user friendly way. This gap is about information at the target group level as well as important information concerning the institutional level.
The specific objectives of the study were:

- A description of the programme area and its problems at the state, district and village levels.
- Identification and assessment of the main actors and activities related to watershed development in Gujarat.
- The identification of different stakeholders at the state, district and village levels.
- An assessment of capacity building requirements at all involved levels in watershed development.

The aim of the target area analysis was not to give a representative view over the problems in the villages of the selected districts, but to give a deeper insight into the situation, the problems and their context in a small number of selected villages (see chapter 3.3.2). The objective of the assessment of the main actors and activities related to watershed development was to achieve a broad overview of competencies and capacities of possible project implementing agencies and other institutional stakeholders in Gujarat. Furthermore, specific efforts to adapt the watershed development approach to the local conditions in Gujarat were reviewed.

3.2 Conceptual approach

For the undertaking of this study, "action and decision-oriented research method (ADR)" has been used[9]. This research method aims to provide operational (action-oriented) information, that facilitates planning, implementing and evaluation tasks. Furthermore it promotes decision-making processes rather than scientific research. This concept is developed for multidisciplinary research. The way of proceeding is

[9] For a more detailed description see NAGEL and FIEGE, 1998.

flexible and iterative which involves a permanent modification and adaptation during the process of research. After the definition of the objectives of the research, the next step was the elaboration of the context of the research, defined as research topics. This determines the areas of research for which information is to be collected. The purpose of the research questions is to narrow down the research topics. They specify which aspects of the topic should be examined. Research topics and research questions are listed in Annex II.
An overview of the schedule for this research study, including preparation as well as the field phase, is given in table 1.

This study incorporates both – field surveys and review of secondary literature. This means, that research questions could be answered by a short review based on existing literature, like questions concerning the state of Gujarat, or with a detailed description of interactions. The latter has, for example, been done with research questions to be answered at the target group level.

During the field phase, the research team split up into two groups. One team carried out the target group analysis in the selected villages. The second team carried out the identification and description of capacity building institutions, as well as the assessment of government and NGO activities in watershed development. The findings of the two teams were combined; the assessment of capacity building needs as well as the implications for the proposed Indo-German Watershed Development Programme were collectively elaborated by the two teams. An overview of the activities carried out by the two teams is given in figure 3.

A draft report was given to NABARD and KfW. Their comments were incorporated in the final version of the report.

Table 1: Schedule for the research study

Week	Research phase	Activities	Place
1-6	preparation of research	elaboration of research plan	Berlin
7-8	orientation and contacts	presentation of research plan to NABARD, the Government and NGOs, collecting information, preparation of field visits	Ahmedabad
9-14	field phase	target area analysis	Kachchh, Dahod
		identification and description of capacity building institutions, assessment of NGO and government activities in watershed development	Kachchh, Dahod, Bhavnagar, Sabarkantha, Bharuch, Ahmedabad, Gandhinagar
15-17	draft report preparation	draft report writing	Ahmedabad
18-20	final investigations, report preparation	report writing, incorporation of comments in the draft, collection of additional information	Ahmedabad

Figure 3: Overview of research activities carried out by the two research teams.

3.3 Research Methods

3.3.1 Methods and tools for institutional analysis

In order to gain an overview of the strengths and experiences, as well as of the weaknesses of the organisations, through which watershed development projects in Gujarat are implemented, an institutional analysis was undertaken. Meanwhile, a critical assessment of the guidelines of the watershed development approach was undertaken and some difficulties in its implementation could be revealed. An assessment was also made of further needs in capacity building at the project implementing agency (PIA)[10] level and at the programme management level.

The analysis comprises government implementing agencies and 15 selected NGOs (see Annex III) which were active in the field of watershed development during the past years. The criteria by which the NGOs were selected were as follows:

- At least 5 years experience in the implementation of watershed development.
- A good reputation (this turned out to be a crucial point in Gujarat as will be shown below) based on the recommendation of several sources (NGOs, NABARD, DRDA, other institutions).
- Active in at least one of the priority districts.

In fact, in each of the priority districts, two to five NGOs were examined.

For the exploration a combination of several methods was used to ensure the validity of the data. The information pamphlets, annual reports and other publications of each organisation were reviewed to get a preliminary impression about the range of activities, goals and philosophies of the concerned organisation. Further still, a questionnaire was handed out to each NGO, containing self-assessment tables, multiple-choice assessments as well as open-ended questions (see Annex IV). Information was collected which related to objectives, activities, tasks and skills of the NGO concerning watershed development, networking and training activities. It included a critical review of the watershed development concept (mainly with reference to the government guidelines). Reflections on implementation strategies and difficulties in implementing them were documented.

[10] A PIA is a government or non-government organisation or institution which implements watershed development projects on behalf of a donor and/or a programme management agency.

In addition to the above mentioned activities, a semi-structured interview was conducted with the director and selected staff members of the NGO at the (Gujarat) head office of the organisation. After a brief overview about the NGO, the interview focused on the specific strategies adopted in the implementation of watershed development projects and monitoring systems used. The infrastructure, such as rooms, library, meeting halls, training facilities, guest-house, off-farm facilities, etc. was assessed during this visit. At the same time, these visits offered an opportunity to observe interaction and communication patterns among the employees and between subordinates and superiors, as well as the degree of hierarchy between them. This was used as one of the indicators for the ability to implement a participatory and bottom up programme.
The schedules for training programmes for villagers or other NGOs were reviewed. In some cases the researchers had an opportunity to participate in an on-going training course for villagers or NGO staff, and observed the training methods and tools which were being used.

A field visit to a project area in one of the priority districts to a watershed development project which was in the final stage of implementation or was just completed was conducted to validate the impressions. The field visit consisted of a transsect walk together with staff members of the PIA (field workers, project coordinators, in some cases the director) and members of the target group. A meeting with members of the Watershed Development Committee, members of Self Help Groups (SHG), User Groups and the village panchayat was arranged by the field staff, who also functioned as interpreters. Discussions with the members of the target group cross-checked the statements made by the implementing NGO. A semi-structured interview format was used to compare the different interviews conducted (see Annex V). The field visit was completed by observations with regard to the nature of interaction and communication of the NGO-field workers with the target group as well as to the degree of participation, self-reliance and empowerment of the different sub-groups of the village with the help of an observation check-list. Indicators were, for example, the presence and participation of women at the meetings which took place at the time of the visit, the ability of people to read and explain the watershed plan to us, the ability of people to explain the functioning of different structures and institutions, etc.

For an inquiry into the institutional framework in which watershed development activities are embedded, semi-structured interviews were conducted with the Rural Development Department, the District Rural

Development Agencies in Kachchh and Dahod, the Gujarat State Land Development Corporation and the Forestry Department.

3.3.2 Methods and tools for target area analysis

In order to get an insight into the problems, requirements and potentials at the village level, a target area analysis was undertaken. For this purpose, three villages in Kachchh district and three villages in Dahod district were selected. These villages were chosen to cover, as far as possible, the range of different conditions in the districts. Therefore, four main criteria were identified: the physical environment and geography, the existing infrastructure, the socio-economic situation and NGO activities undertaken so far. For details see table 2 and 3 below.

Table 2: Criteria for selecting villages in Kachchh

Criteria	Examples
Physical environment and geography:	
differences in groundwater quality and availability	saline groundwater versus small sweet water aquifer
geographical spread	different *talukas* in Kachchh
general physical criteria	coastal versus inland proximity to versus distance from Rann of Kachchh
Existing infrastructure:	
differences in accessibility of the villages	*pucca* road versus *kacha* road, proximity to versus distance from a town
differences in drinking water supply	pipeline versus tanker and pond
Socio-economic situation:	
differences in population composition	single dominant social group versus multiple social groups
level of development in the area	backward area versus advanced area
NGO activities in the village	no activity versus some activities unrelated to WD programme versus entry point activities for WD programme

Table 3: Criteria for selecting villages in Dahod

Criteria	Examples
physical environment and geography:	
general physical criteria	village with forest versus deforested village
size of village	large versus small (number of hamlets), number of families
geographical spread	different *talukas* in Dahod
Socio-economic situation: differences in population composition	single tribe versus multiple tribes
existing infrastructure: differences in accessibility of the villages	*pucca* road versus *kacha* road, near versus far from a town
NGO activities in the village:	no activity versus entry point activities for WD programme

One of the most important criteria was the NGO activities. To get an impression about the initial situation in the village in terms of problems, awareness, communication, relationship, etc. two out of three villages in every district were selected without any NGO activities in the sense of watershed development. For comparative analysis, however, one village was selected where there was at least some entry point activity like institutional building or the installation of smokeless *chullahs*.

In each village five days were spent for research purpose. The research team was interdisciplinary and comprised four members. It was accompanied by one counterpart and/or a female and a male translator. In the villages the research team divided into two subteams. One subteam focused on the socio-economic aspects in the village while the other subteam studied the natural resource base and, in particular, the agricultural aspects.

Different tools of Rapid Rural Appraisal (RRA) and Participatory Rural Appraisal (PRA) were used in the villages to collect the data. A brief account of the time devoted to different research activities is given below:

- First day: An introductory meeting was organised between the research team and men and women of the village together or separately. This was done in order to explain the purpose of the visit and to get a first hand idea about the geography and the infrastructure of the village and the surrounding area. A resource

map was drawn by the villagers (men/women separately or together). In one of six villages no map was drawn; this was because just a few weeks ago a PRA was done by an NGO and the information was provided to the team. A transsect walk was undertaken through the village along with some of the people of the village.

- Second to fourth day: Semi-structured interviews were conducted by the two subteams; interview partners were chosen at random and also identified purposefully (member of panchayat, teacher, shopkeeper etc.). The subteam focusing on the socio-economic situation stayed mostly in the houses and interviewed mainly women, the elderly and children. The other subteam looking especially at the natural resource base, agriculture and the supply systems (electricity, water, etc.) conducted interviews mainly during transsect walks in the fields, wastelands and forests.
- Fifth day: On the last day, a final village meeting was held. During this meeting, the entire team gave a feedback to the villagers on its impressions during the visit. Another very important purpose of the meeting was to thank the people for the support they gave to the team.

Villagers to be interviewed were selected on the basis of different subgroups in the village, like those belonging to different social groups, the landless, males, females, etc. This was done in order to get an understanding of the interests and perspectives of different stakeholder groups. The researchers made observations during the transsect walks and the interviews. This was helpful in cross-checking the information given by the villagers. This data was about the wells, the fields, the wastelands, the forests, the schools as well as the health status and housing facilities of the villagers. Furthermore the researchers tried to meet the people in different situations of their daily work, like very early in the morning while they prepared food and milked the cattle etc.

The information provided by the villagers and the observations made by the researchers were written down either on the spot or by the evening of the same day. There were daily exchanges of the information collected by the two subteams.
For the evaluation of the collected data, the data from each village were organised and thematically summarised. An overall impression of each village was written and the conditions in the different villages were compared.

4 Watershed Development Efforts in Gujarat -Main Actors and Activities-

4.1 Watershed development as a response to natural resource degradation

Water and soil resources are of crucial importance for human beings. In rural societies, at least 80 percent of a household‘s daily requirements like water, food, fibre, fodder, fuel, fertilisers are met from the environment.

As discussed in chapters 2.3 and 5.5, environment and development are closely related. Poverty, overexploitation of natural resources, degradation of soil and water, decreasing productivity and again increasing poverty are linked to each other in the form of a vicious cycle. The watershed approach aims to break this vicious cycle in an integrated manner. It refers to the conservation, regeneration and judicious use of all natural and human resources within a particular watershed.

Experience has shown that the watershed is the most appropriate "natural" project area for implementing such a conservation project. A watershed can be defined as the drainage basin or catchment area of a particular stream or river. It is all the land and water area, which contributes runoff to a common point. As a consequence, a watershed may be small (consisting of only a few hectares) or huge, covering several thousands of hectares.

The most appropriate size of a micro watershed as a "natural" project area for watershed development activities ranges from 500 to 1500 ha because it allows to focus on all the effects of downhill runoff in a given area and to plan accordingly to control and contain it. Furthermore, it is an area of identification for the people who live in it and depend on its resources.

The concept of watershed development is based on the idea that rain water can be harvested, the direct run-off of water reduced and the groundwater recharged. In a typical watershed development scheme therefore

- mechanical and vegetative structures are installed across gullies and rills and along contour lines,

- erosion-prone and less favourable lands are put under perennial vegetation, and
- areas are earmarked for particular land-use based on their sustainability (SHAH, 1999, p. 13).

Watershed development should generally follow the *ridge to valley* approach. This means that the upper parts of a watershed are treated first and gradually lower parts are taken up. This assures a maximum of water conservation and groundwater recharge. Soil erosion is reduced and structures in the lower parts are protected.

However, watershed development is supposed to be more than a just soil and water management. It should be an integrated approach, which aims to improve rural livelihoods including human resource development, pasture development, agriculture development, livestock management and rural energy management. It should aim at the development of all resources –human and natural– in one ecosystem.

To assure the sustainability of watershed projects, participation and capacity building of the people living in a watershed is a critical factor. Watershed development can only be successful if these people understand the concept and if they are fully integrated in the planning and implementation processes. The transfer of responsibilities to the local people is a major component of the philosophy of watershed development.

In India, early initiatives in watershed development were already made in 1956 when the Central Soil and Water Conservation Research and Training Institute developed 42 small watersheds (SHAH, 1999, p.13). While the emphasis in these projects was mainly on technical aspects concerning surface hydrology, people participation was only introduced in 1974 at four locations. In the 1980s the Government of India took up integrated watershed projects under different new programmes. Several already existing programmes like the Drought Prone Areas Programme also adopted the watershed approach. Since then the Government of India has made more and more efforts to provide funds for micro watershed rehabilitation and development. Institutional capacities for the implementation of watershed development projects have grown enormously both in the government as well as in the non-government sectors. Within semi-arid areas one may often find different co-existing watershed programmes undertaken and implemented by different agencies, including government ministries like the Indian Ministries of Agriculture (MoA), Rural Development

(MoRD) and the Environment and Forests (MoEF), Government of India, as well as by NGOs and foreign agencies.

A valuable contribution to the further development of the watershed approach was certainly made by the Indo-German Watershed Development Programme initiated in 1992 in Maharashtra. The huge programme, funded by the German Government through KfW and GTZ and implemented by NABARD and WOTR on the Indian side, provided a lot of new inputs and ideas for the further development of the watershed concept and contributed very much in the dissemination of this programme.

4.2 The activities of the Government in watershed development

4.2.1 Brief overview on the watershed development activities of the Government of Gujarat

The experience of the Government of Gujarat in the field of undertaking watershed development projects dates back to 1995. Since then, the Rural Development Department, the Department for Agriculture and the Forestry Department implemented a number of watershed development projects under different programmes.

Between 1995 and 2000, the Rural Development Department, for example, completed more than 1260 watershed projects. These projects were launched under the Drought Prone Area Programme, the Desert Development Programme, the Integrated Wasteland Development Programme and the Employment Assurance Scheme, and cover an area of 633,000 ha. Around 70 percent of these projects were implemented by NGOs[11]. In order to decentralise the programme, the District Rural Development Agency (DRDA) serves as a nodal agency at district level. It has to supervise the programme and is responsible for the selection of PIAs, the approval of watershed plans and the distribution of the funds to the Watershed Committees. Furthermore, the DRDA organises regular meetings of the District Watershed Committee[12]. Watershed development activities are also undertaken by

[11] According to the common guidelines for watershed development (see Annex VII), different institutions can become a Project Implementing Agency (PIA): reputable NGOs, research and training institutions, Krishi Vigyan Kendras, Panchayat Raj Institutions, government agencies and cooperations. In Gujarat, the Rural Development Department decided to allot 70 percent of their projects to NGOs.

[12] The District Watershed Committee reviews the progress of the watershed programme, assists in resolving management and administrative problems and guides in implementation. Its members are drawn from concerned line departments, NGOs, governmental PIAs and other relevant institutions.

the Department for Agriculture within the National Watershed Development Programme for Rainfed Areas, and by the Forest Department within the Joint Forest Management Programme. The Gujarat State Land Development Corporation (GSLDC), a semi-governmental agency, is involved in implementing projects for the Department of Agriculture.

Gujarat is one of the first states to introduce a State Scheme in 1999/2000 under the auspices of the Rural Development Department to speed up the work in the field of watershed development.

4.2.2 Government guidelines for watershed development – "The common approach"

In 1999, a need was felt to bring about convergence and harmonisation in the implementation of the various watershed development programmes funded by the Central Government. This was not possible earlier because each programme had its own objectives, and the watershed approach had just been adopted to achieve specific aims. Nevertheless, the six major programmes – the National Watershed Development Project for Rainfed Areas (NWDPRA), the Watershed Development Programme in Shifting Cultivation Areas (WDSCA), the Employment Assurance Scheme (EAS), the Drought Prone Areas Programme (DPAP), the Desert Development Programme (DDP) and the Integrated Wasteland Development Programme (IWDP) had elements of convergence and a considerable common area of operation. These programmes cover 70 percent of the funds and area under watershed schemes. Furthermore, the last three programmes had already been united under common guidelines since 1995.

In an Inter-Ministerial Meeting held on 24 March, 1999, it was decided that a common approach should be developed for these six programmes. For this purpose, a sub-committee was constituted which was mandated to examine the existing guidelines and to develop their common principles. Watershed projects with unique characteristics and a special focus such as the Programme for Reclamation of Problem Soils (by MoA) or the Integrated Afforestation and Eco-Development Programme (by MoEF) were left out because they require a different approach.

The common approach is composed of seven major chapters, which deal with the following:

- Implementation strategies

- Programme content and components
- Principles of project management
- Institutional arrangements
- Capacity building
- Financial aspects
- Monitoring and evaluation

The major aspects of the approach are sustainability, participation, empowerment, decentralisation of administration, promotion of self-reliance, diversification of livelihoods, increase of productivity, focus on labour intensive measures, involvement of indigenous knowledge and materials, linkages to other programmes, research institutions, banks etc. These principles are to be realised through certain measures and activities: the establishment of a watershed association, a watershed committee, SHGs and User Groups[13]. Special consideration is given to women and the landless. Capacity building through exposure visits, training measures, participatory planning, etc. plays an important role as will be discussed in chapter 6.

The scheduled duration of a watershed development project is four years. The project area is limited to 500 ha. The total budget for a watershed project unit ranges between Rs 22.5 lakh to Rs 30 lakh (4,500-6,000 Rs/ha). With this, the former budget of Rs 20 lakh (4000 Rs/ha) per project has increased and is held more flexible. The allocation of funds for major components is indicated in the guidelines. 50 percent of the funds are provided for natural resource management measures, 20 percent for the development of farm production systems for land owning families, 7.5 percent for developing livelihood support systems for landless families, 12.5 percent for community organisation and training programmes and 10 percent for administration costs.
If watershed development projects are implemented by NGOs, these should preferably have at least 4 to 5 years of experience in watershed development. The number of watersheds managed by a Project Implementing Agency (PIA) can range up to ten in a district and should ideally be located in a cluster for effective supervision. The Watershed Development Team (WDT)[14] should consist of four members belonging to different disciplines such as agriculture, animal husbandry, engineering, forestry; optionally, a social scientist could also be included. At least one of the team members should be a woman.

[13]For further specifications concerning the composition and the function of these groups see Annex VII.
[14] Every PIA shall hire a four member Watershed Development Team to work on a full time basis for a cluster of 2-10 watersheds

As compared with the guidelines of the IGWDP undertaken in Maharashtra a major difference is the organisational structure of the project implementation. While in the IGWDP a nodal agency was responsible for execution, supervision and monitoring of the programme as well as for capacity building for PIAs, these tasks and responsibilities are decentralised in the governmental undertakings of watershed development projects. Further, the execution of watershed projects is not divided into a capacity building phase for NGOs and an implementation phase, but training for PIAs is given through various institutions whenever required. Capacity building for members of the village association is provided directly by the PIA, unlike in Maharashtra, where it was arranged through the nodal agency.

4.2.3 Critical assessment of the guidelines

The integrated approach of watershed development as reflected by the various implementing agencies seems to be an adequate solution to break the vicious circle of resource degradation and impoverishment. The findings of a recent evaluation study on the impact of watershed development projects in Gujarat undertaken by the Development Support Centre are predominantly positive (SHAH, 2000b). These findings correlate with the observations which have been made by the researchers.

The watershed development approach aims at a sustainable development of human and natural resources within a watershed. This is to be reached through a package of means at different levels of needs and requirements, and is to be implemented on a multi-sectoral basis. Short-term benefits such as labour work, and long-term perspectives such as community mobilisation and empowerment are entangled in this approach. This is to be realised, for instance, by the formation of SHGs, which serve at a first stage as simple saving groups and turn at a later stage into an operating unit for the release of credit and/ or the receipt of capacity building and empowerment. The SHGs will also be one of the organisational units to be linked to other programmes. At the same time as the establishment of SHGs, the Watershed Development Committee, women groups and User Groups lead to a decentralisation of power structures within a village. In this way they ensure a more equal distribution of benefits among the watershed population and will contribute to more equity.

Also to be acknowledged are the participatory way of implementation, the involvement of indigenous knowledge, of labour inputs and local

material, and the emphasis on low-cost but effective measures, as they are intended by the guidelines.

All in all, the guidelines for the development of watersheds presents itself as a thoughtful and intelligent approach although there are some points that could be further elaborated:

High demands of the programme

The objectives of the approach demand a large variety of skills of the PIA (technical, financial, social skills, role of facilitator). It is doubtful, whether one organisation can fulfil all these demands. It is also questionable, whether watershed development can be expected to be a "panacea for rural development" (SHAH, 1999, p. 25).

Time limit

The NGOs stated almost unanimously that four years are not sufficient for the implementation of an integrated programme such as the Watershed Development Programme. Within this time frame it seems impossible to develop appropriate production systems or to make people rethink about adequate use of natural resources (SHAH, 2000a). Furthermore, many NGOs remarked that more time than the scheduled six to eight months is needed for the capacity building of the village community. In addition, more time and emphasis should be given to a participatory development of a treatment plan, which meets the needs of the population.

Watershed Development Team (WDT)

The monthly budget of Rs 10,000 which is provided for the salaries of the field workers are reported to be insufficient. As a result, either a lack of qualification of field workers or a reduction of staff in the WDT has been observed. In addition, it was sporadically pointed out that four field workers are not sufficient. Furthermore, one sociologist and at least one woman should be in the WDT; it should not be just an option.

Considerations of local conditions

As the guidelines apply to the whole country, they do not take into consideration the local conditions in terms of landscape, wage norms etc. As a result, different treatment costs are also overlooked.

Financial budget

Occasionally, it was mentioned that the financial budget is not sufficient.

Limitation of the project area

In cases where the limitation of 500 ha of a watershed project excludes parts of a village, not everybody will get benefits. Equity and social

cohesion are endangered. The limitation of the project area is handled in a highly inflexible manner.

The monitoring system

Too much emphasis is laid on quantitative targets. Only the physical and financial progress is monitored. The government does not request a qualitative monitoring, a fact which runs counter to the emphasis which is laid on social project components such as participatory approach, capacity building, empowerment, etc. Moreover, many NGOs complained that the monthly monitoring sheets of the government are too time consuming.

Goal of equity

The guidelines call for special efforts in improving equity and the strengthening of the socio-economic status of the landless. Yet, the treatment of common land, on which mainly the landless depend, is an option and not mandatory. Therefore, the benefits for the landless consist mainly of short-term labour income through the building of physical structures instead of long-term perspectives.

Moreover, no long-term perspective for the landless concerning income generating measures are proposed in the common approach. To some extent, migration of the landless can be reduced due to the increased agricultural productivity of farmers‘ land and, therefore, labour opportunities in the agricultural sector of the particular watershed are created. But these limited opportunities would eventually prove insufficient to meet the labour demand of the landless. In this case, it could even lead to new forms of exploitation of resource poor by rich farmers, as the latter will then be in the position to determine the wage norms. This has happened in some cases and was stated by some NGOs who had implemented watershed projects. Moreover, the neglect of the landless could widen the gap between the well-off and the poor in a long-term perspective, giving rise to conflicts. Disputes about the distribution of benefits of the project between the landless and the farmers in a Watershed Development Committee have already been observed in some cases. In fact, the guidelines provide a certain amount (7,5 percent) of the funds for the development of livelihood support systems for landless families. But the guidelines do not state clearly how this could be achieved.

The focus on the development of poor quality and marginal lands owned by resource poor families as described in chapter 5.A.11 of the common approach (see Annex VII) runs counter to the *ridge to valley* approach in cases where such lands are not located near the ridge.

Participation versus fixed regulations of the programme

The guidelines are designed to hand over a large portion of responsibility to the villagers. At the same time quite strict instructions are also given. The Watershed Development Committee, for instance, should be formed by free elections while there are already comprehensive preconditions concerning its constitution (see common approach in Annex VII). The location of physical structures should be decided by participatory decisions while the final decision is taken by the technicians of the PIA.

Some absences inherent in the guidelines eventually lead to shortcomings in the implementation of watershed development projects. Here one must especially mention the lack of incentives to support time-consuming and low-cost measures as capacity building or small physical structures, and the deficiencies in the monitoring system, which measures only physical structures and financial aspects. This could well lead to a way for implementing agencies to misuse funds (see chapter 4.3.1).

4.2.4 Major implementation difficulties

The following comments are based on the experiences of the PIAs studied as well as on the observations of the study team.
As the projects under examination were implemented according to the old guidelines, the difficulties mentioned below trace back to these. Nevertheless, the following remarks are still of significance as no comprehensive changes took place in the guidelines.

Project planning with regard to the financial budget

In some cases the projects are not properly planned. As a result the financial resources run out even before the lower part of the watershed can be treated.
The release of funds by the government is often too late (sometimes even up to two years), so the implementation gets postponed, and villagers start losing confidence in the programme or in the NGO.

Ridge to valley approach

In cases where the upper part of a watershed consists of saline geological formations, it is not advisable to follow the *ridge to valley* approach. The storage of rainwater at the ridge would cause an increase of salinity in the lower parts of the watershed.

Focus on physical structures

Some of the NGOs tend to focus on the construction of physical structures such as check dams, which are less time consuming, than on measures in the social field like community organisation and capacity

building. Often, the entire amount of the budget earmarked for community mobilisation is not spent. One could assume, that this fact is due to a lack of control and incentives provided by the guidelines to undertake measures in social aspects, e.g. by a qualitative monitoring system (see chapter 4.2.3).

Development of common property resources

The development of common property resources is a complicated and sometimes delicate subject. It is especially difficult to organise the distribution of benefits. Controlled grazing, for example, or the distribution of the harvest of tree plantations on common land are challenging tasks. Possibly the treatment of common land is avoided because of this.

Involvement of resource poor in the project activities

The development of livelihood support systems for the landless as stated in the guidelines was rarely realised.

Self Help Groups

The village population (especially affluent families or people in certain well off regions) does not always require saving activities as a starting point activity for the establishment of SHGs. In these cases, the condition of having 50 percent of the watershed population organised in SHGs is hard to meet. Consequently, the people who are not members of a SHG do not take advantage of other activities undertaken within a SHG at a later stage of the project, such as training activities.

Watershed Development Committee

Women and the landless were not always represented in the Watershed Development Committees. In some cases, local politicians and traditional leaders were dominant in the Watershed Development Committee.

Watershed Development Team

It was observed that many NGOs had no female field workers. This could either be due to a shortage of trained female workers or a lower preference for female workers among NGOs.

Cooperation with line departments

Linkages with government extension workers are considered as difficult to establish.

Cooperation with Salinity Ingress Prevention Circle

As reported by one NGO, the cooperation with the Salinity Ingress Prevention Circle, a governmental agency, proved to be difficult. Since the Salinity Ingress Prevention Circle conduct projects in coastal areas,

which are planned in a long-term perspective, NGOs are in some cases not allowed to work in these regions.

Cooperation with the Forestry Department

Forest lands, which require treatment are often located at the ridge of a watershed. The lack of cooperation from the Forestry Department, however, proved to be difficult in many cases (see chapter 4.2.5). This makes it, in some cases, impossible to follow the *ridge to valley* approach.

4.2.5 The role of the Forestry Department in watershed development

Ten percent of the land in Gujarat is officially registered with the Forestry Department. While there are districts with no forest land, the percentage of land owned by the Forestry Department in other districts varies up to 30 percent. Most of the forest land is to be found in hilly areas and in the upper parts of watersheds.

Concern over the rapid rate of deforestation in India has evoked responses at both the policy and the grass root levels. At the policy level, the Joint Forest Management (JFM) programme, also known as Integrated Afforestation programme, evolved in 1991. It is nowadays the major programme of the Forestry Department with an annual coverage of 60,000 ha. Since 1997 the Japanese Bank Integrated Corporation (JBIC) has been providing the funds. The budget provided for the JFM is not exploited, which means, that each application from the villagers or of an NGO for a JFM project is sanctioned. Although JFM projects are also operated in a micro watershed, the programme was not integrated in the "common approach" discussed above, because of its exclusive focus on the forest land within a watershed.

The JFM programme seeks to foster partnerships between the Forestry Department and institutions (e.g. user-groups), consisting of interested villagers and headed by a Forest Protection Committee. The partnership is formed on the basis of sharing benefits and forest management responsibilities, while the ownership of the land remains with the Forestry Department. The participating villagers are assured free access to most non-timber forest products and a 50 percent share of poles/timber on final harvesting. In return, they are expected to protect the forests.

The implementing phase of a JFM project includes soil and moisture conservation measures such as check dams, *nala* plugs or water-tanks,

but not contour bunds. The villagers are involved in building the physical structures on the basis of labour work, supervised by the PIA.

In most cases, the JFM projects are guided by NGOs because of their higher degree of flexibility, knowledge about the target group and experience with a participatory approach. The role of the NGO as expected by the Forestry Department is not that of an implementing agency, but that of a facilitator. The planning of technical measures is undertaken by the Forest Protection Committee and the Forestry Department staff, and the construction is supervised by the concerned Forestry officer.

As far as the inclusion of forest land in a micro watershed under the scheme of watershed development is concerned, difficulties in cooperation with the Forestry Department were reported from many sides. It was stated, that the permission to include the forest land in the treatment of a watershed was often denied. As a result, the forest land of a watershed could not be treated, or else, the concerned PIA treated the forest land without permission.

Since 1997, a way for the treatment of forest land within a watershed development project has been opened up in Gujarat. In 1998, the Forestry Department published a decree in which the importance of the treatment of forest land within a watershed, especially with regard to the *ridge to valley* approach of the watershed development programme, was acknowledged. In the circular, the Forestry Department declares its general agreement to cooperate with the programme under following conditions:

- The organiser of the watershed development project has to obtain the permission of the Forestry Department for the treatment of the forest land.
- The funds for the treatment of forest land will not be provided by the Forestry Department.
- The ownership of such forest land will remain with the Forestry Department. The treatment of the forest land within a watershed development scheme will not allot any rights to the organiser of the programme after project implementation.
- Soil and water conservation works should support the forest development on the forest lands. A Forest Protection Committee will serve as a user-group according to the JFM guidelines.
- The PIA for the forest land within a watershed development project will either be an NGO or the Forestry Department itself (the latter

opportunity is to be found only in watersheds where the percentage of forest land predominates).
- The preparation of a treatment plan of forest land is to be done in consultation with the concerned Divisional Forest Officer (DFO). The plan has to be sanctioned and the implementation will be supervised by the DFO.
- Soil and water conservation measures have to be constructed under the guidance of the concerned DFO.

The role of the NGO concerning the forest land of the particular watershed will be, in accordance with the guidelines of the JFM programme – in practice, that of a facilitator. As stated by the Forestry Department, this role is generally accepted by the NGOs.
In recent years some progress has been made in finding a solution for the cooperation difficulties. Since a change in leadership within the Forestry Department took place on the 1st of September 2000, cooperation patterns between the Forestry Department and the different actors might change, as it was stated by some NGOs.

4.2.6 Other governmental programmes relevant for watershed development

Minor Irrigation Programmes

These programmes are coordinated through the Department for Water Resources, Government of Gujarat. They are implemented by District Local Bodies (panchayats) and the work is taken up on common land. The soil and water conservation is generally done through check dams, gully plugs, percolation tanks etc.

Tribal Support Programmes

The Tribal Support Programme, through Tribal sub-plan and Gujarat Tribal Development Corporation, has many activities relevant to the Watershed Development Programme. These activities include irrigation projects, soil and water conservation work, agriculture input programmes, animal husbandry programmes etc. They aim for the development of tribals, especially of those, who are economically disadvantaged.

Women Programmes

The Department for Women and Child Development and the Gujarat Women Economic Development Corporation have many programmes relevant to the Watershed Development Programme. The programmes include the Swaranjayanti Rojgar Yojana and the Rural Women Empowerment (Swa-shakti) Project. These programmes aim at securing the economic development and social empowerment of rural women

living below the poverty line. The SHG is taken as a unit of development. The SHGs are planned to be linked with banks and agencies involved in marketing, micro-enterprise development and training for women.

Credit Programmes

Financial institutions such as banks, multi-purpose cooperative societies, agriculture cooperative societies etc. have schemes to meet the credit needs of watershed related activities. The loans are for different purposes. They may be long term loans given for soil and moisture conservation work, digging wells, purchase of implements, bullocks etc., or crop loans to meet short-term needs. Banks may be classified as nationalised, cooperative, land development and regional rural banks. Each district in Gujarat has a leading nationalised bank, which takes a lead in meeting the credit needs of people from that district.

It is easy to access these programmes once a watershed development project is approved. Many of the NGOs which were studied by the research team were successful in establishing linkages with other governmental schemes in order to provide additional support for the village population in question. The above mentioned programmes are only a selection from the large number of different existing rural development programmes.

4.3 The role of NGOs in watershed development

4.3.1 Overview on NGOs in watershed development

A couple of thousand NGOs that are registered in Gujarat have long experiences in development work. Specifically in Gujarat, many NGOs have been founded by charitable industrialists, who are originally from the region. Some of the NGOs had originally sprung from an NGO-mother organisation and subsequently got autonomous. Other NGOs, however, were initially SHGs. Their activities range from tasks in urban slum areas, advocacy for and empowerment of the poor as well as women, tribal development programmes, health and sanitary programmes, employment generation programmes, natural resource management, agro-forestry and animal husbandry development schemes to research and training activities.

In the district of Kachchh, for instance, more than 80 NGOs are seen operating, 18 of which are at present involved in implementing projects under the watershed development schemes of the RDD, or of

other funding agencies. The number of watershed development projects sanctioned in Kachchh ranges from 50 to 80 projects each year. The number of projects implemented by one NGO ranges from two to fifteen. The state government has set a limit of fifty watershed development projects that an NGO can implement in Gujarat at a given point of time. An NGO generally works in a few selected districts in Gujarat, depending on its specific environmental and social focus.

Several NGOs in Gujarat are influenced by a Gandhian style of village-based, economically modest and autonomous way of life, which sometimes affects the staff of the particular NGO. This also affects the implementation strategies of watershed development projects as will be shown in chapter 4.3.3.

The status of NGOs in Gujarat appears to be very strong. They are a driving force as regards development of policy issues in theory and practice. They also organise platforms of exchange, of experience and of discussion among NGOs or between NGOs and politicians. Members of NGOs also participate in various committees concerning watershed development at the state and district levels. These committees consist of representatives of governmental departments, research institutes and NGOs. The responsibilities of various committees are:

- The task of the State Watershed Programme Implementation and Review Committees is to monitor, review and evaluate the progress of implementation of the watershed development programme.
- The Standing Committee on Watershed identifies important bottlenecks of the programme and offers solutions.
- The State Level Committee for Training develops and standardises training modules for different target groups, identifies appropriate training institutes in the state, and develops strategies for training.
- The task of the State Level Monitoring and Evaluation Committee is to develop systems for monitoring and evaluation of watershed development projects at the village, PIA, district and state levels.
- The District Watershed Development Committee reviews the progress of watershed development projects at district level, guides in implementation and identifies policy issues for state and national committees. It consists of representatives of the PIAs for watershed development programmes of the government and of officers of the concerned departments.

Several networking and information exchange systems among NGOs exist, some of which are discussed below in further detail. NGOs are

also engaged in research and training activities, both, at the village and at the PIA levels (see chapter 6.3.1).

The outstanding role of the NGOs of Gujarat is also reflected in the extent of cooperation between the NGOs and the state government. The funds for the programmes implemented by NGOs are mainly provided by various government departments such as the Rural Development Department, the Department for Forestry and Environment, the Social Welfare Department and others. Around 70 percent of the implementing agencies in watershed development in Gujarat are NGOs, while in the neighbouring state of Rajasthan, NGOs are involved in just 3 percent of the watershed development projects.

Unfortunately, the close collaboration between NGOs and the state government in watershed development activities, which appeared in recent years, led to the rise of spurious NGOs. "Bad NGOs" became a common term in Gujarat and is nowadays a much discussed subject in NGO and government circles. A large amount of government funds are allotted to NGOs as project implementing agency. So, development work became a business for some rising NGOs which could open up a way to get access to these funds through the help of political patronage. By manipulating the accounts they succeed in pocketing a part of the funds for their own purposes. Their names are generally well known among the established NGOs and the district officers of NABARD.

4.3.2 Cooperation among NGOs and NGO networks

The NGOs of Gujarat have a strong tradition of networking. The cooperation among NGOs is organised in different ways. It ranges from informal contacts and working groups to formal and legally registered networks. The main purpose of networking in Gujarat is the exchange of knowledge and expertise among NGO members. Some of the topics discussed are general subjects such as resource management as well as special issues like the problem of salinity, water scarcity or women empowerment. The membership of these networks varies from 10 to 160 NGOs. Other types of cooperation are the exchange of staff, mutual consultancy services and training on specific issues for other PIAs.

A very vivid cooperation among NGOs could be observed at the district level where the information exchange among NGOs is more intensive than at state level. Often NGOs are organised in district wide networks, as for instance in Kachchh, where the Kachchh Navnirman Abhiyan Sangh unites 14 local NGOs.

One important network to be mentioned in Gujarat is the SAJATA network. It is a network of 22 voluntary organisations active in the field of natural resource management and dedicated to a participatory way of working. SAJATA was formed in 1996 by five NGOs which felt the need to strengthen their work through mutual learning and experience sharing. For this purpose a series of meetings and consultations were undertaken. The principles of SAJATA are transparency, sincerity and democratic decision making. Voluntary agencies which want to join the forum must follow these principles in interaction with the target group, government and donor agencies as well as in the internal processes of the organisation.

The concept and organisational form of SAJATA evolved during the last four years. The network which was formally registered in 1999 no longer concentrates only on capacity building but also on issues like policy advocating especially in the field of watershed development. SAJATA seeks to influence government policies and donor agencies to change present policies and to improve the effectiveness of the efforts made by NGOs. In their regular meetings, SAJATA members discuss delicate issues like the emergence of a large number of spurious NGOs or the often contested distribution of government funded watershed projects to PIAs. To have a closer contact with government officers, the meetings generally take place in Ahmedabad and are followed by visits to the Rural Development Department. In this way, an intensive interaction with the Rural Development Department and its officers can be achieved.

Besides its policy advocacy function, SAJATA undertakes field studies to document the impact of initiatives undertaken by NGOs in the field of resource management in order to identify "best practices". SAJATA also organises exposure tours, workshops and seminars for its members. For the wider promotion of ideas, the work of member organisations is published and exhibited.

4.3.3 Approaches of NGOs in watershed development

Many NGOs have developed special implementing strategies in watershed development. The specific biases in the philosophical and personnel constitution of the NGOs result, in praxis, in different approaches in implementing watershed development projects. Also, the various implementation strategies arose out of a theoretical and practical dealing with the watershed development programme. In other cases, they represent the adaptation of the approach to the regional

environmental or social specifics, which are worked out by the local NGOs.
In correlation to the goals and objectives of each organisation, the focal points vary, and different priorities concerning the professional backgrounds of the staff are set up. As a result, the implementation of watershed development projects concentrates more either on the construction of technical measures, or on community organisation and mobilisation. UTTHAN, for instance, developed specific strategies for the empowerment of women. The first contacts in a village at the beginning of a project are made with women. The formation of women into SHGs and focus group discussion on women's issues are the first activities. Only after the women are organised and receive training measures, are men involved into project activities.

The Aga Khan Rural Support Programme (AKRSP), Gujarat, sometimes undertakes the training measures on technical issues just for women. The idea is that women, in general, pass on their knowledge of agricultural subjects to men; men do not do so, thereby not letting women benefit from the knowledge. As both sexes are engaged in agricultural activities, this strategy combines the criteria of efficiency, broad effect and empowerment of women.
VIKAS focuses on the support of the landless. Through their organisation and their mobilisation, the landless are enabled to claim governmental wasteland within a particular watershed and to take up agricultural activities.
In NGOs, where the professional qualification of the staff allows it, supportive activities such as afforestation, horticulture or animal husbandry are given more weightage.

Some NGOs explore new strategies of implementation of watershed development project through their theoretical and practical work in the watershed development approach. ASA, for instance, has developed a strategy to increase the degree of participation and equity, and to evolve more transparency and decentralisation of power within a watershed. By not placing the decision power more or less exclusively on the Watershed Development Committee, the SHGs appear to be the key cells of development activities. The entire watershed population is organised into SHGs, whereby each SHG consists of 15 to 20 households. Each SHG elects, according to the size of the village or watershed, one or two members as representatives to the Watershed Development Committee. The participation at elections and discussions, the transparency of decision making and the information flow within a SHG, which forms at the same time an interest group, is said to be higher than in a village meeting, through

which a Watershed Development Committee is usually elected. Natural ways of communication and social coherence can be exploited and strengthened, and the coordination of development activities can be improved. Individuals and fringe groups, who have less access to political power, can that way be better involved in development activities, and the democratic processes within a watershed can be improved because of the decentralisation of decision making. ASA argues, that if the interest groups are dominated by one or two persons it may be better than the domination of the entire village through certain members of the Watershed Development Committee.[15]

VIKAS has adopted a strategy to improve the credibility of the NGO in the eyes of the target group, and to enhance the relation between the NGO and the target group. At the beginning of a project, one or more members of the target group are chosen, who are introduced to the ideas and benefits of watershed development activities. These persons pass the information on to the village population or their respective subgroups. In addition, there is direct contact between the NGO and the target group. Also, these persons function as mediators and facilitators. For each cluster of villages, VIKAS has several local facilitators at its disposal, on which it can rely when a new project starts.

Another specific strategy of implementation concerns the contribution fee of target group members for soil and moisture conservation structures. In some cases, a graduation of contribution fees concerning structures on private land was realised, depending on the financial situation of the particular beneficiary. This was done in order to create more equity among the target group. In order to improve the willingness and responsibility of user-groups to maintain the physical structures, a contribution fee higher than the required 5 percent to 10 percent was occasionally taken from the farmers. In one case, the contribution fee was to be paid in cash. It was stated, that a contribution in cash leads to more discussion among farmers of the user-group before the implementation of the particular structure. This leads to a higher degree of transparency and conformity in the user-group. A cash contribution is said to be feasible for every farmer by earning money through labour work or by taking a credit.

[15] It is stated, that in some cases the composition of Watershed Development Committees barely fulfils the quota of membership required (if at all), for instance, women members are not given any power of decision making. Some interest groups, such as the landless or animal breeders, are often not represented in the Watershed Development Committee and, therefore, excluded from the watershed development activities.

Sadguru puts much emphasis on establishing linkages with other government schemes in order to provide additional support to the particular watershed population. This is done especially in fields, which are not covered by the watershed development programme.

Adaptations of the watershed development approach to local conditions were also observed in the field. VIKAS, for instance, developed a special strategy for the coastal areas of Bharuch district, where creeks carry saline sea water into the land and make it infertile. Therefore, a major check dam was built on the creek towards the sea side, along with two small water retention structures along the entire length of the creek. On the one hand, this helped stop the sea water entering the land and on the other hand, to retain the run off water of rain. Further degradation of the land was prevented, and existing salinity in the land was reversed through the collected rainwater and vegetation activities.

The various approaches in watershed development lead to different impacts and results, which have been observed in the field.

4.3.4 Brief assessment of NGO activities in watershed development

NGOs in Gujarat working in the area of watershed development are quite competent. Many NGOs have considerable experience in natural resource management and many of them have been implementing watershed development projects for more than 5 years. The watershed approach is, in general, well known, and it is adapted by many NGOs in a reasonable way.

Nevertheless, some weaknesses and variations in the quality of work of NGOs could be observed. The most striking result of the assessment was the gap between social and technical competencies of NGOs. The NGOs observed did not seem to have equal skills and qualities in both fields; they did not place equal emphasis on the two. For the implementation of watershed development projects, on the other hand, both are required to the same extent. Those NGOs which are quite strong in technical issues often showed shortcomings in the social field of implementation. On the other hand NGOs with a strong emphasis on social aspects, such as community organisation or empowerment, sometimes lacked in the technical part of implementation. Sometimes, this was due to a lack of qualified engineers and in many cases, these NGOs started only in 1995 to work in the field of resource management and watershed development.

Differences could also be observed as regards **gender and qualification of NGO staff**. Although in many NGOs, the share of female staff and social workers was quite high, some NGOs, even reputed ones, showed little awareness of the importance of female workers and qualified social scientists, and as a consequence their staff was dominated by male and technically oriented staff.

Variations across NGOs could be observed with regard to the **contact with the target group**. While some of the NGOs seemed to have intensive contact with the target group, others had a more distanced relationship with the village people. In focusing on community development before implementing the physical structures, a more personal contact with the village population could be achieved. Furthermore, it could be noticed that NGOs with female field workers had a better access to women. It turned out to be an advantage that some NGOs had members of the staff living in the villages or very close by. Some NGOs involved local staff to facilitate the contact with the target group.

Participatory approaches were more or less applied by NGOs. While some NGOs were not very familiar with participatory methods and tools, others developed their own participatory approaches and applied it during the entire project phase. This was also observed by a recent study done by Anil Shah (1999, p.20): "Within the various implementing agencies there is considerable variation in the extent to which they have moved towards participatory principles in their working style." The duration of PRA phases varied among the NGOs from two days to eight months. Many NGOs didn‘t seem to understand the importance of participatory approaches, and applied PRA methods just because it is required in the watershed development guidelines.

Varied emphasis was laid upon the component of **community organising**. Some NGOs only built up watershed committees and user groups, others, in addition, formed SHGs. While some NGOs placed importance on the formation of SHGs, for others it seemed to be just a project component required by the guidelines. These SHGs often do not have any function and their meetings quickly break up.

NGOs applied different methods of **capacity building** for villagers. In most of the cases, training schedules were set up for members of watershed committees, user groups and SHGs. The training concerned the maintenance of physical structures and accountancy, and only in a few cases was social awareness training given to the villagers. Many NGOs looked at capacity building as a technical training only.

Important and central issues such as behavioural change and awareness building were rarely addressed in training courses.

For some NGOs the construction of many check-dams seemed to be a matter of prestige. This indicates a lack of knowledge about the **principles of the watershed development** approach. Most of the NGOs put a greater emphasis on water resource development. As a result 70 to 80 percent of the budget of watershed projects was spent on water storage structures (SHAH, 1999, p.26).

Knowledge about afforestation, agriculture and pasture development, as well as animal husbandry varied among the NGOs. The qualification of members of the Watershed Development Team had a direct influence on the measures realised during the project implementation.

With regard to the establishment **of linkages with other programmes,** different approaches could be observed. Some NGOs consider it important to link people to government agencies and banks. This step is considered by them as an aspect of empowerment.

Some NGOs were very successful in **empowering women**. This could be realised through a strict involvement of the female village population in all phases and components of the project. It could be recognised that in some of the "treated" villages visited, women were very self-confident and aware of their rights. In one case women were observed to claim their active participation in the village panchayat. For other NGOs empowerment seemed to have less importance.

Most of the NGOs did not have strategies for the **empowerment of the landless**. Only one NGO enabled the landless to reclaim land from the government. One could assume that the empowerment of the landless is a very delicate and difficult matter and many NGOs do not manage to deal with it.

Very few NGOs were able to achieve an **involvement of all subgroups** in a watershed project, and, as a consequence, benefits were not distributed in an equal way. In most of the projects farmers were the only direct beneficiaries. The landless and women profited only indirectly. Many NGOs were aware of this problem, so it was assumed that this situation was either due to a lack of suitable strategies or a lack of knowledge about them.

Most of the NGOs just applied the quantitative **monitoring system** required by the DRDA. Only a few NGOs undertook qualitative monitoring. As a consequence, social and qualitative achievements were not measured. The lack of a qualitative monitoring system is partially due to the lack of incentives given by the government. Many NGOs did not seem to be aware of the importance of this kind of monitoring. For some other NGOs monitoring was equivalent to sporadic field visits.

In conclusion, it must pointed out that inspite of their rich experience and their good performance, in general, in the implementation of watershed development projects, NGOs still show some gaps and shortcomings in specific fields. In order to bridge these gaps, further training has to be provided to NGOs according to their individual requirements. In chapter 6.2.2 the capacity building requirements at PIA level are elaborated in a more detailed way.

4.4 Watershed development activities of NABARD

4.4.1 The approach of NABARD to rural development

The National Bank for Agriculture and Rural Development (NABARD) was established in 1982 in order to ensure the flow of credit for the integrated development of rural areas. NABARD is a multi-disciplinary organisation with the task of accomplishing sustainable rural development. As part of its mandate, NABARD primarily performs Planning, Refinancing, Developmental and Regulatory functions. It not only assists credit institutions but also supports the initiatives of the informal sector to achieve its objectives.
NABARD is an apex level development financial institution and provides **short term as well as long-term refinance assistance** to Commercial, Cooperative, and Regional Rural Banks to enable them to finance agriculture and allied activities like minor irrigation, farm mechanisation, animal husbandry and poultry, fisheries, plantation and horticulture, wastelands and watershed development, forestry, rural infrastructure, etc. It also provides assistance for the development of **Rural Non-Farm Sector (RNFS)** comprising small, tiny, cottage and village industrial and service units in rural areas.

Within its **Rural Infrastructure Development Fund,** NABARD provides finance to State Governments and Government owned Corporations for completion of on-going projects. It also gives funds for implementation of new rural infrastructure development projects in the fields of irrigation, road and bridge construction, watershed management,

forest development, flood protection etc. Between 1995 and 2000, 68,625 projects were sanctioned within this programme. Since 1999, the scope of the Fund has also been extended to cover *gram panchayats*, Self-Help-Groups and NGOs.

Under its **Rural Promotion Corpus Fund**, NABARD has been providing grants to NGOs and other developmental agencies since 1995 to support various programmes in the rural non-farm sector. This could be through training programmes for the rural population, assistance for rural women in non-farm-development, creation of artisan guilds etc. Besides this, several other funds like the Research and Development Fund, the Cooperative Development Fund, the Credit and Financial Services Fund have been established to improve the access of credit to the rural poor and micro-enterprises.

In 1992 NABARD launched the **SHG linkage programme**, a programme for linking SHGs with banks with the objective of evolving supplementary credit strategies for meeting the credit needs of rural poor and to encourage banking activities for the poorer sections of the population which often have no access to formal financial institutions. Furthermore, NABARD has created a **Credit and Financial Services Fund** to support the endeavours and initiatives of intermediaries like NGOs and Banks in the field of micro-credit.

The **Vikas Volunteer Vahini Programme** has been set up by NABARD in order to disseminate the message of "Development Through Credit" through volunteers to the farmers and non-farm rural entrepreneurs.

4.4.2 The Watershed Development Fund

The Watershed Development Fund established with NABARD in 1999 covers a total amount of Rs 200 crore. The allocations to this fund are divided among NABARD and the Government of India with equal contributions of Rs 100 crore.

The watershed fund aims to spread the message of participatory watershed development and wants to create suitable framework conditions to replicate and consolidate the isolated successful initiatives made so far by different actors under different programmes. The allocations of the fund are utilised for different purposes:

- Promotional efforts with communities, NGOs, SHGs, panchayats, bankers and government departments.
- Capacity building activities for communities, NGOs, SHGs and Panchayati Raj Institutions.

- Financing watershed development projects.
- Supporting promotional activities for micro-credit and promotion of SHGs.
- Lending flexible support to other related and essential activities.

One third of the fund will be given as a grant for activities covering promotional efforts, capacity building and for watershed projects implemented under the Maharashtra Indo-German watershed model. The other two-thirds of the fund will be loans for state governments for the implementation of watershed development projects.
The budget announcement envisages a coverage of 100 priority districts within 3 years. Criteria for the selection of states, districts and *talukas* are:

- A significant proportion of SC/ST population.
- A high extent of rainfed farming.
- A high potential for watershed development.

In the first stage of the programme implementation the States of Gujarat, Orissa, Andhra Pradesh and Madhya Pradesh are focused upon.

The implementation of projects will be taken up by village level institutions. NGOs would act as facilitators and provide the necessary technical support as well as the capacity building at village level. Communities which want to implement a watershed project have to run through a capacity building phase. The financial sanction of the project implementation is given only after a successful participation in this capacity building phase.
Other key principles for the execution of NABARD-funded watershed projects are community participation, adoption of the *ridge to valley* approach, establishment of maintenance arrangements etc.
The NABARD staff in the respective states is responsible for the selection, sanction, coordination and monitoring of the projects.

Gujarat is the first state in India to implement projects under the scheme of the Watershed Development Fund. The nine districts of Gujarat selected for these projects are Banaskantha, Kachchh, Dahod, Surendranagar, Bharuch, Rajkot, Dangs, Amreli and Narmada.
As of September 2000 two projects (on grant basis) have been sanctioned:

- The Salapada-Zharikhud watershed project in Dahod, implemented by Sadguru.
- The Kochbar watershed project in Bharuch implemented by Aga Khan Rural Support Programme.

4.4.3 The regional watershed development cell

The regional watershed development cell of NABARD in Gujarat is composed of four persons with professional experience in the fields of land and water resources development, agriculture, forestry and economics. The regional watershed cell took up its work in August 1999. The responsibilities include supervising and monitoring the Watershed Development Fund projects, of which 19 are planned to be undertaken in the first stage of the programme. While eleven of the projects are implemented on the basis of loan, the funds for the remaining eight are given as grant. In addition to the watershed projects, the cell handles the KfW-NABARD Comprehensive Tribal Development Project and the CEC-BAIF Transfer of Technologies for Sustainable Development Project.

The fact that NABARD offers possibilities for credit related activities in the post watershed development stage is seen by the team members as an important potential for further activities in watershed development. As stated by the employees, another major strength of NABARD is the intensive liaison with NGOs, state government, other apex institutions and research bodies. According to them, these contacts can even be extended to new and upcoming NGOs in future.

The members of the watershed cell admit that their staff strength will be a limiting factor once the KfW assisted watershed programme is launched. However, they consider it as a potential that, within the branches of NABARD in Gujarat, staff can easily be transferred from one department to another. If there is a need for further personnel, for example with a social sciences background, they can easily be sourced from within NABARD. The periodic rotation-system of NABARD employees is considered to be a strength and a constraint at the same time. The transfer and exchange of experiences gained in different states of India is clearly a plus point, while comprehensive knowledge about regional specifics cannot be built up within this time.

At present, the watershed cell consists of male staff only. No member of the staff has a social science background. The technical bias of the watershed cell is reflected in the implementation strategies for the Watershed Development Fund. For instance, the NABARD sheets for selection of NGOs focus mainly on technical data. Further, the monitoring system of NABARD concentrates on quantitative data and does not take qualitative aspects into consideration.

Finally, it has to be pointed out that the NABARD watershed cell is quite open for any criticism and suggestions for improvement. Being

aware of its weaknesses, the watershed cell shows willingness for further improvement and development of its capacities.

5 The Target Area for Watershed Development: Two Selected Districts

5.1 Situation analysis at village level

The aim of the target area analysis is to give a deeper insight into the situation, the problems and their context in the selected villages (see chapter 3.1). To achieve this aim, the analysis is subdivided into three parts. At first, a brief analytical description of the situation in the selected villages will be given. The villages of both districts are described separately. Out of this information, some important fields of problems will be picked up and analysed in further detail regarding the implementation of a watershed development project.
In the end the main identified problems will be joined together in a diagram.

5.2 Kachchh district – an overview

Kachchh, situated in the western side of Gujarat, is the largest district of the country. It constitutes nearly one fourth (45,650 sq. km) of the total area of the state but only around three percent of the total population (1,262,507) lives there (DIRECTOR OF CENSUS OPERATIONS, 1992a, p. 23). 26,000 sq. kms of Kachchh are desert or desert like (NABARD 2000a, p.4). The major part of the desert belongs to the Rann of Kachchh, on the Pakistan border, and the Little Rann of Kachchh in the south east.

The climate is semi arid to arid with very erratic rainfall of 360 mm per year in average. (see figure chap. 5.2.1). The drainage of the area is directed northwards and southwards through ephemeral rivers because of ridges in the central area which serve as watersheds (NABARD 2000a, p. 4).

Kachchh can be divided into three major geological and topographical units:
The coastal zone in the south: It is characterised by marine deposits, slight to highly saline groundwater and a shallow undulating surface (per.com. VRTI, Mandvi).
Northwards, this zone enters into a hilly area with a range of about 300 meters height and mostly vulcanite with inter-trappean beds (JOSHI, 2000, p. 10). In this part of Kachchh, one of the most important aquifers is located, ensuring the supply of drinking water not just in this region but also through long distance pipelines to different parts of the district (per. com. VRTI, Mandvi).

Along the Rann of Kachchh in the north, there stretches a band again with marine sediments proximate connected to the hilly area in the inland. Storing of rainwater there is possible only in surface structures like ponds or pits, because the groundwater table of saline water is too high. Because of high salinity in most areas of Kachchh the groundwater use for drinking purpose as well as for irrigation is very limited.

Map 2: The administrative division of Kachchh and the sample villages

(Source: NABARD 2000a; modified)

These physical characteristics of the district are the main factors influencing agriculture. Of the total rural area (1,703,500 ha), 43 percent is under cultivation, with 39 percent rainfed area and 4 percent irrigated area (DIRECTOR OF CENSUS OPERATIONS, 1992a, p. 23). Another 12 percent of the land is cultivable waste, 34 percent is not available for cultivation and 11 percent is forest land.

The major crops cultivated are groundnut, millet, different pulses, sorghum and cotton. From the above, the main cash crops are groundnut and cotton, and nowadays castor is gaining more importance (per. com. Mr. Kanzaria, VRTI).

It is difficult to get a more intensive agricultural production with high yields because water is again the most limiting factor. Because of the good soil in this region, the main focus for development in this field is the supply of irrigation facilities.

Another important part of the agricultural economy is animal husbandry. Cattle wealth occupies a pivotal place in the economy of Kachchh district. There are five major types of livestock – bullocks and cows, buffaloes, sheep, goats and camels.
Drought years are the main limiting factor for livestock farming, because the livestock population might decrease drastically. During these years there is also a tendency to migrate with animals to other parts of Gujarat, because of lack of fodder and water for the animals (DIRECTOR OF CENSUS OPERATIONS, 1992a, pp. 25, 26).

The prevailing types of forests in Kachchh are dry grassland, littoral and swamp forests. These forests are mainly used for firewood, timber, fodder and as grazing land.

Of the total population, about 70 percent lives in rural areas and 57 percent depends on agriculture. Other major predominant economic activities of Kachchh are mining, salt extraction, small scale industries (SSI) and processing units as well as other service sectors and handicraft. It is important to note that the economy is dominated by inward remittances (NABARD, 2000a, pp 4,5).

The district is politically divided into 10 *talukas* with 949 villages of which 899 are inhabited (NABARD, 2000a, p. 3). Because of the deterioration of the natural resource base and better opportunities for growth in the urban areas (per. com. Mr. Pillai, VRTI) there is a tendency among the younger generation in the rural regions to migrate to the urban and semi-urban areas.

Of the total rural population (874,650 persons), about 12 percent belongs to Scheduled Castes in 713 villages and nearly 7 percent are Scheduled Tribes, residing in 558 villages. (For Scheduled Castes and Scheduled Tribes see Glossary). The literacy rate in rural Kachchh of around 45 percent seems to be quite high, but there is a remarkable imbalance between males (57 percent) and females (32 percent). In 1991, ninety percent of the villages had at least basic educational facilities (NABARD, 2000a, p. 3; DIRECTOR OF CENSUS OPERATIONS, 1992a, pp. 12, 29).

In the health sector the situation is worse. Slightly more than 50 percent of the villages have any medical facility. Of the remaining settlements, the majority is situated five and more kilometres away from the nearest health institution.

5.2.1 The three sample villages

On the basis of the criteria described in chapter 3.3.2 three villages were identified for the research in order to get an overview about some problems of this area. A brief profile of each village, based on the selection criteria is provided below in table 4.

Table 4: The main characteristics of the three selected villages of Kachchh

Criteria	**Dhokda** Loc. Code No.* 44	**Laiyari** Loc. Code No.* 22	**Atdo** Loc. Code No.* 12
Physical environment and geography			
Taluka	Mandvi *taluka*	Abdasa *taluka*	Lakhpat *taluka*
Total area of the village	1432 ha	1636 ha	1812 ha
Location in the region	near the coast	inland of Kachchh (saline groundwater)	close to Rann of Kachchh

Criteria	Dhokda Loc. Code No.* 44	Laiyari Loc. Code No.* 22	Atdo Loc. Code No.* 12
Socio-economic situation			
Level of development	advanced area	backward area	backward area
Total population (females/males)	302 people (138/164)	339 people (178/161)	206 people (91/115)
No. of households	58 households 30/47	67 households 22/39	40 households 19/31
Literates: females/males			
Social groups	Harijan, Darbar, Brahmin, Muslim	Rabari, Koli, Harijan	Darbar, Sodha-Darbar, Harijan, Muslim
Existing infrastructure			
Type of access road	*pucca* road	*kacha* road	*pucca* road
Water supply	pipeline and pond, no well	pipeline and pond, no well	tanker, well and pond
Distance to nearest town (name of town)	24 km (Mandvi)	15 km (Naliya)	60 km (Naliya)
Bus stop	yes	yes (seasonal)	yes
NGO activities			
Entry point activities for a WD project	installation of smokeless *chullahs*	none	none
others	handicraft (with one social group)	none	handicraft (with one social group)

(Source: DIRECTOR OF CENSUS OPERATIONS, 1992a; VRTI, Mandvi)[16]
* The Location Code Numbers refer to the District Census Handbook 1991.

5.2.2 Environmental characteristics and water situation

The villages are located in a line of slightly decreasing annual precipitation. Erratic rains, the decreasing annual rainfall from South-East to North-West and a massive evaporation of 1800 mm per year are the main characteristics of the three villages. These conditions seem to be representative of the district (see figure 4).

The topography of the villages Dhokda and Laiyari can be described as slightly hilly with wide plateaux but cut up by deep gully erosion. *Prosopis juliflora*[17] is the dominant vegetation in the wastelands and forest areas. Some other species like neem, succulents and shrubs are also seen. Vast areas are characterised by meagre grass vegetation. Especially, those areas which are subjected to wind and water erosion, and are hence deforested, are affected by heavy desertification seen as soil skeletons and erosion down to bedrock. A wide range of wind and water erosion types are present. The unhindered flow of the rainwater from *ridge to valley*, intensifying soil and water erosion as

[16] In 2002 the new District Census Handbook will be published with the latest data.
[17] *Prosopis juliflora* is an exotic species that has invaded the natural vegetation. It was introduced by the Forestry Department.

well as the resultant loss of water seem to be the main problems in all three villages. In Laiyari, the older people observed the genesis of 5 to 6 metre deep gullies within a period of 20 to 25 years. In this area the major amount of annual rain falls within a few days so the erosion power is immense. During this time masses of water stream through the seasonal riverbeds into the sea. In 1999, a devastating cyclone affected a wide area of this part of Kachchh and destroyed houses and fields. A large number of trees got uprooted, and a large number of people and cattle died.

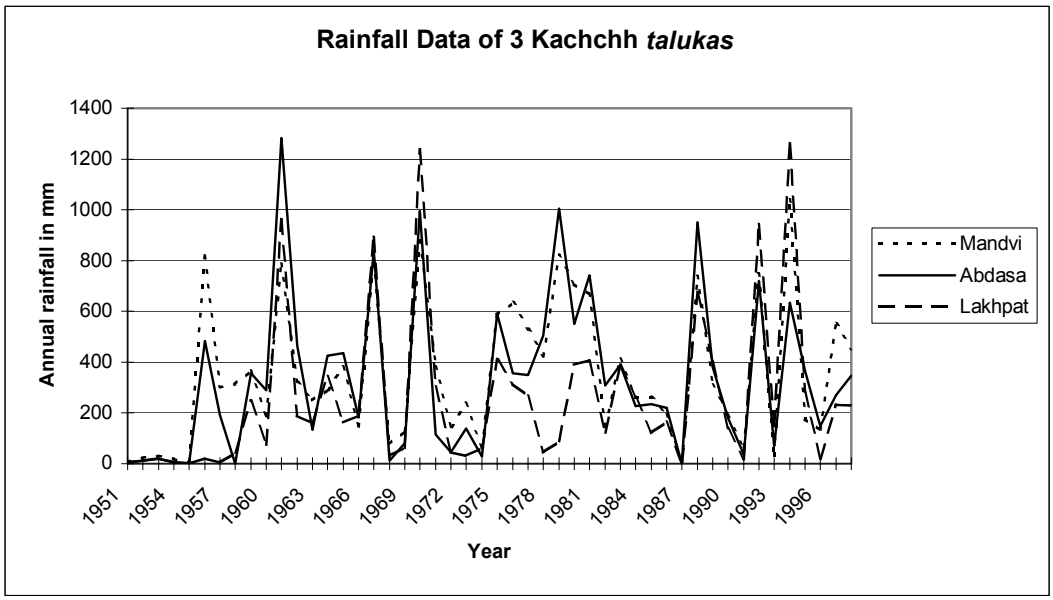


Figure 4: The annual rainfall data of three *talukas* in Kachchh (source: VRTI, Mandvi; design: CATAD-team)

The visible geology is characterised by marine deposits as sandstone and limestone as well as granite. Sealing layers of clay, marl or similar material, important for a prospective storage of water, are mostly found. The decreasing level of groundwater in the water table has gone along with an increasing salinity of the aquifers in the last decade (see chapter 2.3). But structures like percolation tanks or dams, causing a recharge of aquifers, show that with an increase of the water table, freshwater will be found.

In Atdo, near Lakhpat, the topography as well as the hydrogeology are quite different from the one mentioned above. The village is located in a bowl surrounded by hills, only on one side opening to the Rann of Kachchh. In the lower areas the groundwater table is just a few metres under the surface, but the water is saline and only in some cases suitable for irrigation. In the upper regions of the hillside sweet water of good quality is found throughout the year. Again the unhindered

runoff of the rainwater and its erosion power is to be seen as one of the major problems. But the preconditions for water conservation measures are different compared to the above regions, because of the proximity to the saline Rann of Kachchh. Consequently, the storage of freshwater is only possible in surface structures like ponds or pits, at least in the lower areas.

Water situation in the villages

None of the three villages would be able to survive so far on their own water resources. In Dhokda and in Laiyari the supply of drinking water was organised by long distance pipelines (Dhokda 8 km, Laiyari 34 km). The water was taken from groundwater resources of other villages, provided free of charge and without any purification. The quality in Laiyari was described by the villagers as good but in Dhokda the water became more saline with time and some health problems were stated, like diarrhoea, vomiting and fever. It was not clear if these problems were only caused by the tap-water, because at times when public water supply was not working, water was taken out of open ponds as an alternative. This was common in all three villages. In Laiyari, the villagers stated that they frequently stay up to 15 days without any water supply through the pipeline. Consequently, the alternative sources, questionable from the hygienic point of view, have to be used. Even if it was told that the water would be kept only as a drinking water source and not used for other purposes, the cows usually were an exception because of their religious status. In Dhokda, the situation is likely to improve due to another groundwater source of good quality near the village.
Methods of water purification were not known. Except in some cases of filtering the water through a cloth, the villagers do not practise any method of water purification.

For the past two years, Atdo has been getting drinking water by tankers. This water is provided by the government free of charge. It is of good quality and again a pond is being used as an alternative. Before this time the village managed on its own resources. Mainly a well at fifteen minutes walking distance and the water from an open pond were used. The villagers applied for the supply by tanker because the recharge of the well was poor. So conflicts between the different users (villagers for drinking/herdsmen for cattle) emerged. The pond often dried out during drought season. So, these structures are used nowadays in addition to the tank water, for washing and for the cattle.
In this village, step-wells as traditional water harvesting structures are still exist but they are out of use since many years. The people stated that because of the decreasing ground water table and less rain they dried out.

5.2.3 The role and problems of agriculture, livestock and forestry

Cultivated crops

In all the three villages studied in Kachchh, nearly all agriculture is rainfed. One crop per year, the *kharif* crop, can be cultivated. Only a limited number of farmers who have access to irrigation facilities can cultivate two crops, a *kharif* and a *rabi*, per year.
The farmers prefer to cultivate the most profitable cash crop which is groundnut but its cultivation is possible only during high rainfall. Among the three villages studied in Kachchh during the 2000 monsoon season, only Dhokda received sufficient rainfall for groundnut cultivation. Other cash crops, cotton and castor were also cultivated only in Dhokda village. In the other two sample villages cluster beans (*Cyamopsis tetragonoloba*), green gram (*Vigna radiata*) and sesame (*Sesamum indicum*) were cultivated as cash crops. However, these three crops are also consumed by the farmers themselves. Hence, only during the years of good rainfall, can the surplus be sold. Crops which are exclusively used for self consumption are millet (*bajra*) and sorghum (*jowar*).

Importance of agriculture

In all three villages, agriculture is more important than livestock husbandry and labour work. Villagers mentioned that they preferred agriculture and that in years with good rainfall they could earn more from agriculture as compared to labour work. Further, all farmers indicated, that they would not do any labour work if they could increase crop production. Several persons also expressed the view, that they would decrease their number of cattle, if cropping could be improved.

Risk of crop failure

The biggest problem with agriculture is the high risk of crop failure because of drought. Farmers often have to take credits because of investments required in seeds. Farmers gave the information that about seven out of ten years are drought years resulting in a poor harvest or a complete crop failure.

Erosion problems of the fields

In all the villages studied by the research team, there were erosion problems in the fields. Deep erosion gullies divided the fields. Farmers do not practice contour ploughing, but change the direction of ploughing every year. They consider this technique as important for soil fertility. The risk of soil erosion is further increased, because all cultivated crops are sown in rows. In most cases there were neither any

erosion protection measures around the fields nor did the farmers maintain field bunds which had been constructed under one of the drought relief programmes of the Government. The reasons for this, given by the farmers, were lack of time and insufficient financial resources.

Invasion of Prosopis juliflora

Another problem of cropping is the invasion of *Prosopis juliflora* from the wasteland into the fields. The farmers stated that the reason for this problem is migration. During the months that they are away, they cannot take care of their fields.

Need for agricultural extension

Former nomads, who have settled down, as well as former landless people, stated that they were not very familiar with agricultural practices. These people have a need for an agricultural extension service in order to improve the agricultural practices in a sustainable way.

Land property situation

The land cultivated by the majority of the farmers is their own property. Furthermore, some farmers are at present cultivating land which they have taken on lease. These fields are mostly leased from people who have migrated permanently. Consequently, the tenancy is a long term one – up to 30 years. These fields taken on lease are treated in the same way as land that is owned by the people. As the villages in Kachchh comprise a large amount of common land, the farmers also took parts of this common land under cultivation.

Livestock husbandry

In all three villages studied in Kachchh, the households keep a considerable amount of livestock (cows, oxen, buffaloes, goats, sheep and camels). Milk and milk products are for self consumption and the surplus is sold in the market. Camels are bred for selling purpose and are used for transportation. The meat of sheep and goats is consumed only by Muslims. But even they rarely consume meat. The dung of the cattle is either sold or spread on the fields and used as an energy source. Furthermore, wool and leather are also sold.

Forage supply

There is no fodder production, but the animals graze on the wastelands and are fed with harvest residues. Some fodder like bran was purchased. In case of drought, the Government and/or private donors provide fodder for the cows either free of cost or at very low prices. As a consequence, the amount of cattle does not correspond to the amount of fodder available on the wastelands.

Wasteland management

The pressure of the villages on the wastelands is very high. In addition, wastelands are treated as "open access" lands. The pressure on the wasteland is further increased, since cattle from surrounding villages, as well as cattle of nomads passing by, graze on the wasteland. For cattle of surrounding villages, fees are charged; the nomads, however, are paid, because the dung of their cattle fertilises the fields after the crop harvest.

Forestry

The forest land of the villages studied is used for firewood and cattle grazing. During a drought period, the branches of trees are cut to feed the cattle. In large parts of the forest land, *Prosopis juliflora* is nearly the only tree. While the number of indigenous tree species is decreasing, the area covered by *Prosopis juliflora* is increasing very fast. Because of the demand for firewood and grazing, the reserved forest areas are illegally used.

5.2.4 Socio-economic characteristics and problems

Settlement patterns and population

The settlements of the three villages studied have a compact appearance which means that the houses are not scattered in the total area of the village.

The population in the three sample villages consists of different social groups[18] (see chapter 5.2.1). Members of the same social group live in the same cluster of houses. The different clusters are adjoined. In Dhokda, the population comprises of a vast majority of one social group (Darbar) and two minorities (Harijan, Muslim). In the other two villages, the different social groups make up about equal shares of the village population. Besides the Muslim families, all other villagers are Hindus. Both joint family and nuclear family concepts are common.

Economic activities

In a good monsoon season, agriculture is the most important source of income for the families in all three villages. This is true for farmers as well as for agricultural labourers. Different crops (see chapter 5.2.3), milk, *ghee* and *mava* (see Glossary) are the products that are sold. An exception is Dhokda where milk is not sold although the milk produced exceeds self-consumption. In former times, a priest-like person[19] (*pir,* Muslim) told the people not to sell milk. An assumption by the research team is that in earlier times the production of milk was not as good as

[18] Members of the same social group belong to the same caste (e.g. Darbar), tribe (e.g. Rabari) or religious group other than Hindus (e.g. Muslims).

[19] This person had come in the 1950's from an area of now Pakistan and died about 30 years ago.

today so that the *pir* put priority on consumption of milk by the villagers themselves in order to ensure a sufficient nutrient intake. Nevertheless, *ghee* is sold in this village. In Laiyari and Atdo, where milk is sold, there is no organised manner of selling. For example in Laiyari, people transport the milk collected from their cattle individually (by foot to the next main street, then by bus) to the next town (Naliya).

Handicraft (weaving, embroidery, spinning, stitching, etc.) is an important additional source of income for many families in all three villages. Darbar women have the tradition of making handicrafts. In Dhokda and Atdo, NGOs organise the regular supply with raw material and the marketing of the ready made or semi-processed material. In Laiyari, mainly the Rabari women make handicrafts[20] but neither the supply nor the marketing is organised in any way. Each woman produces according to irregular orders by individual persons in the nearest town. Some also produce more but do not get it sold. Harijan women in Atdo cooperated with an NGO concerning handicrafts but the cooperation stopped due to unknown reasons.
Handicrafts could play a considerable role as a major source of income during drought seasons. Preconditions would be to organise it, to open up regular marketing possibilities and, in order to enable the women to produce substantial amount, to support the women in their everyday duties (timesaving measures).

Another non agriculture related economic activity is labour work outside the villages, seen for instance, in construction work, and in carrying loads. Further, only some villagers are engaged in economic activities which require specialisation (tailoring, carpentry) or investment (transportation with camel-carts/rikshaws, shop-keeping). Labour work in construction on common properties organised by the government mainly during drought periods (drought relief programmes) is another common source of income. This includes repairing roads and building structures (for example dams). It can give those villagers, who stay in the villages during drought periods, the possibility of making a living there. Nevertheless, many people have to migrate (see below) for making a living as the demand of workforces in this government provided construction work is not sufficient and not regular.

A common observation in all three villages is that in many cases different sources of income are present in one family. One may conclude that having a diversified portfolio is an integral part of the

[20] The Rabari women did not have the tradition of making handicrafts but picked up the skills by watching women of neighbouring villages.

survival strategy (see chapter 5.4.3) in a high risk environment such as in Kachchh district.

Income is mainly used for buying seeds, additional food items and other household items. In the villages studied, there is no government supported fair price shop[21]. However, in two villages there are private shops which sell (some of) the same items at higher prices. Due to poor transportation facilities, many villagers can not take the advantage of the lower prices in the government supported shops.

Migration

Seasonal migration is common in all three sample villages and among all the social groups. Villagers stated that it has increased in the past 10 years. To find work between the cropping seasons, villagers migrate to other rural areas. If they do not find work there, they migrate to urban areas in the same district or even to distant places. There, the most common work of temporary migrants is work at construction sites as daily wage workers[22].
In Laiyari, either parts of the families (mainly males) or if needed entire families migrate. If a family owns cattle few members of the family stay back. Many families had been gone for years before the 2000 monsoon season because there was not sufficient rainfall in the past years for undertaking agriculture. In Atdo, the situation is similar to the one in Laiyari. In Dhokda, there is very little temporary migration. However, several houses in the Harijan and the Muslim neighbourhood were found permanently abandoned[23]. This was also the case in different parts of the other two villages but not in the Darbar neighbourhoods.
People stated that they would prefer to stay in the villages if they could make a living there.

Health

In all three villages the health status among the villagers varied considerably. A relation between the health status and the economic situation can be drawn. Accordingly, in poorer families the prevalence of malnutrition due to insufficient nutrient intake was evident.

The staple foods in Kachchh are *bajra* and *jowar*, rice and wheat which are cultivated by the villagers. Different pulses (see chapter 5.2.3) serve as main protein source if available. Milk and milk products are

[21] Government supported fair price shops provide sugar, wheat, rice and kerosene at fixed prices. Additionally, they often stock other household items at regular prices.
[22] The living conditions for the villagers staying in urban areas are miserable; their dwellings are tents of plastic set up at the construction site.
[23] Villagers stated that some come back occasionally to look after their houses.

also consumed but the availability varies considerably with the economic situation of a family.

A relationship can be drawn between poor quality of drinking water (mainly open water sources, see chapter 5.2.2) and health problems. Some villagers themselves mentioned that due to the contaminated water that they drink, they are prone to various diseases (worms, fever, diarrhoea). In none of the three villages, water used for drinking purposes is treated in any way, for example by boiling. The latter would mean extra consumption of time and energy (firewood).

Another health hazard is the use of simple fireplaces (*chullah*) for preparing food inside or in front of the houses. The smoke adversely affects the eyes and the respiratory tract. In Dhokda, smokeless *chullahs* were installed by an NGO at the time of the research.

In none of the three villages was any kind of health facility available to take care of common acute health problems like diarrhoea, vomiting, fever or injuries. Due to lack of transportation, it is difficult to reach even the nearest health care facility.
The research team did not find any person or family practising indigenous medical knowledge.

Education and Literacy

In each of the three villages there is a primary school. However, many children of schoolgoing-age, especially in Laiyari, do not attend school. One reason is that children are important workforces in their families. They support their families in many tasks (household and economic activities[24]) or even manage these tasks by themselves. Another reason is the widespread lack of awareness concerning the future benefits of having literate and educated children. Some families stated that they did care about education for their children but the short-term need of additional workforces urged them to put their children to work. Children who do attend school in the villages cannot continue with school in the cases where they migrate together with their parents for work to urban areas. The majority of the children attending school are boys.

Illiteracy among adults is also a problem. This applies to both genders but women in all three villages are more at a disadvantage. Some adults interviewed were aware of the need to be literate and the

[24] This comprises activities such as collecting firewood, collecting cow dung, taking care of smaller children, taking cattle for grazing etc.

benefits resulting from it but did not see any chance of becoming so, having already passed schoolgoing-age.

5.3 Dahod district – an overview

Dahod is situated in the eastern part of Gujarat, with Rajasthan in the north and Madhya Pradesh in the south-east. Its geographical area is 4918 sq. kms, which is hardly more than one tenth of the area of Kachchh. But one third more of the population of Kachchh, i.e. 1,725,954 people, live in Dahod. More than 90 percent of the population lives in rural areas and the remaining, in semi-urban areas. (NABARD ,1999, p. 7)
In this region, the climate is semi-arid with high drought frequency and a normal annual rainfall of 1000 mm to 1150 mm (NABARD, 2000b, p.7). Generally, the monsoon arrives in June and extends up to October each year. But the monsoons are erratic and long dry spells are common even in the rainy season (see figure 5). So a drought situation is frequently faced in this district.

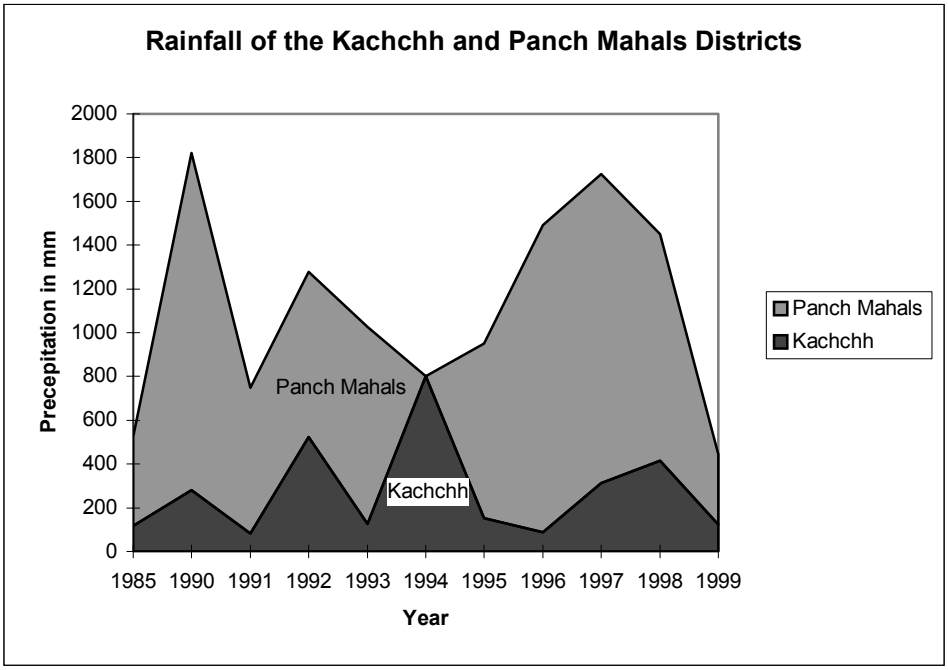


Figure 5: Average annual rainfall of the Kachchh and Panch Mahals Districts

(source: DIRECTORATE OF AGRICULTURE, 2000, table 3.1)

The topography of the district is generally rugged with an elevation of more than 400 m above mean sea level. Moderately to highly dissected plateaus and fractured hills characterise the landscape. The terrain is

mostly rocky with low hills. Heavy flow of water in the steep valleys results in high erosion during the monsoon season.
The main geological formation consists of hard rocks including basalt, granites, gneisses, schists, phyllites, limestone and sandstone (SADGURU, n.d.). Geographically, the district can be divided into two: a western plain land and a more hilly track in the eastern part. This subdivision also corresponds with the main soil types. In the western plain a sandy loam type soil is found which is fertile, whereas in the hilly track the soil type is shallow hilly and black.
The quality of water for drinking and irrigation purposes has been acceptable so far. But recently traces of higher fluoride levels, salinity and nitrate contamination have been found. (NABARD, 2000c, p. 13)

Map 3: The administrative division of Dahod and the sample villages

(Source: DIRECTORATE OF ECONOMICS AND STATISTICS, 1995, Map 1; modified)

90 percent of the total district consists of rural areas, out of which 56 percent is under cultivation and only ten percent is irrigated. Another 24 percent is under forest area, 13 percent is unavailable for cultivation and seven percent is classified as cultivable waste (NABARD, 2000c, p. 9). The distribution of the cultivable resources amongst the cultivators is unequal. Around 80 percent is owned by medium and large farmers with land holding sizes of 2 and more hectares. The small and marginal farmers who form the majority (nearly 60 percent) own only the remaining 20 percent of the cultivable land.

Paddy and maize are the main *kharif* crops and the area used for their cultivation is the highest in the state. The major *rabi* crops are wheat and gram. (NABARD, 2000c, p.). Additionally groundnut is seen as the main summer crop and nowadays more emphasis is given to soya bean. The major horticultural crops are mango, guava, lime and amla (NABARD 2000b, p.8).

Animal husbandry does not enjoy as important an economic status as it does in Kachchh. There are three kinds of animals and the number of each kind is roughly equal - draught animals (445,539), cows and buffaloes (413,547) and sheep and goats (433,917) (NABARD, 2000b, p. 8).

More than 90 percent of the working population in Dahod depends on agriculture (NABARD, 2000b, p. 8). Consequently, this sector and its allied activities are the main sources of income and employment for the people.

Dahod district has been recognised as an industrially backward district. The only industrial activity is confined to Dahod *taluka*. Some manufacturing units are identified as thrust industries, as they produce garments, gems and jewellery. Other units include agro-processing, food processing, leather products and ancillary engineering industries (NABARD, 2000c, p. 17).

Originally Dahod belonged to the erstwhile district of Panch Mahal. In 1998 Panch Mahal was divided into two separate districts. Some *talukas* got internally divided and fell to either side. So both, Dahod and Panch Mahal recorded newer districts. At present, Dahod is subdivided into seven *talukas* with 694 villages and 423 gram panchayats NABARD 2000c, p. 7). The last census was edited in 1991 so proper statistical data about the two new districts is hardly available. Therefore the following description of the socio-economics of Dahod gives just a

rough idea of the situation. In 2001 the new census will provide appropriate data.

Of the total population, about two percent comprises Scheduled Castes and more than 72 percent comprises Scheduled Tribes (DIRECTOR OF CENSUS OPERATIONS, 1992b, pp. 14). In rural Dahod, the portion of scheduled castes and tribes is even higher (per. com. Mr. Patel, Sadguru[25]). The literacy rate of the rural population ranges between 25 to 37 percent. Like in Kachchh the difference in literacy between males and females is considerably high. It ranges from 37 to 50 percent for the males and 12 to 23 percent for the females. Educational facilities seem to be advanced. Nearly 100 percent of the villages have at least one school.
76 to 100 percent of all the villages have at least basic medical care within the village itself. (DIRECTOR OF CENSUS OPERATIONS, 1992b, pp. 38-42)

5.3.1 The three sample villages

As it was done in Kachchh, in Dahod also three villages were identified for the target area and problem analysis. Referring to the selection criteria listed in chapter 3.3.2 a brief profile of the sample villages is provided in table 5.

Table 5: The main characteristics of the three selected villages in Dahod

Criteria	**Bhanpur** Loc. Code No.* 223	**Pada** Loc. Code No.* 91	**Kotda** Loc. Code No.*114
Physical environment and geography			
Taluka **Total area of the village** **Number of hamlet** **Stage of forest**	Limkheda *taluka* 1188 ha 5 hamlets dense forest	Limkheda *taluka* 749 ha 6 hamlets deforested forest area	Jhalod *taluka* 153 ha 1 hamlet deforested forest area
Socio-economic situation			
Total population (females/males) **No. of households** **Literates: females/males** **Proportion of ST**	1591 people (791/800) 356 households 22/96 100 percent	661 people (329/332) 116 households 53/170 less than 50 percent	252 people(121/131) 36 households; 8/39 100 percent
Existing infrastructure			

[25] Mr. Anil Patel works at Sadguru Water and Development Foundation and joined the research team as an interpreter and resource person.

Criteria	Bhanpur Loc. Code No.* 223	Pada Loc. Code No.* 91	Kotda Loc. Code No.*114
Type of access road	*pucca* road	*kacha* road	*pucca* road
Water supply	hand pumps, wells, pond	hand pumps, wells, river	hand pumps, wells, pond
Distance from nearest town	31 km (Dahod)	24 km (Dahod)	22 km (Dahod)
Bus stop	no	no	no
NGO activities			
Entry point activities for a WD project	none	group formation, distribution of water purification kits, etc.	none
others	introduction of mango horticulture		

(Source: DIRECTOR OF CENSUS OPERATIONS, 1992a; VRTI, Mandvi)[26]
* The Location Code Numbers refer to the District Census Handbook 1991.

Unlike in Kachchh, in Dahod it seemed important to focus on the size of the village area especially in terms of communication inside the villages. Therefore, three villages of varied sizes in terms of the total area of the village were chosen for the study.

5.3.2 Environmental characteristics and water situation

Of the three villages selected in Dahod, the environmental characteristics as well as the environment related problems are very different from Kachchh. Due to the climatic conditions Dahod is covered with more dense vegetation and erosion is not ever-present.

The climatic conditions in the three villages vary with the topography. While it was raining in Pada and Bhanpur this year, Kotda stayed almost dry. Already the rainfall data of the three *talukas* Limkheda, Dahod and Jhalod (see figure 6) show a similar scenario. These circumstances may be influenced by the missing vegetation and/or the different topography in Kotda.

[26] In 2002 the new District Census Handbook will be published with the latest data.

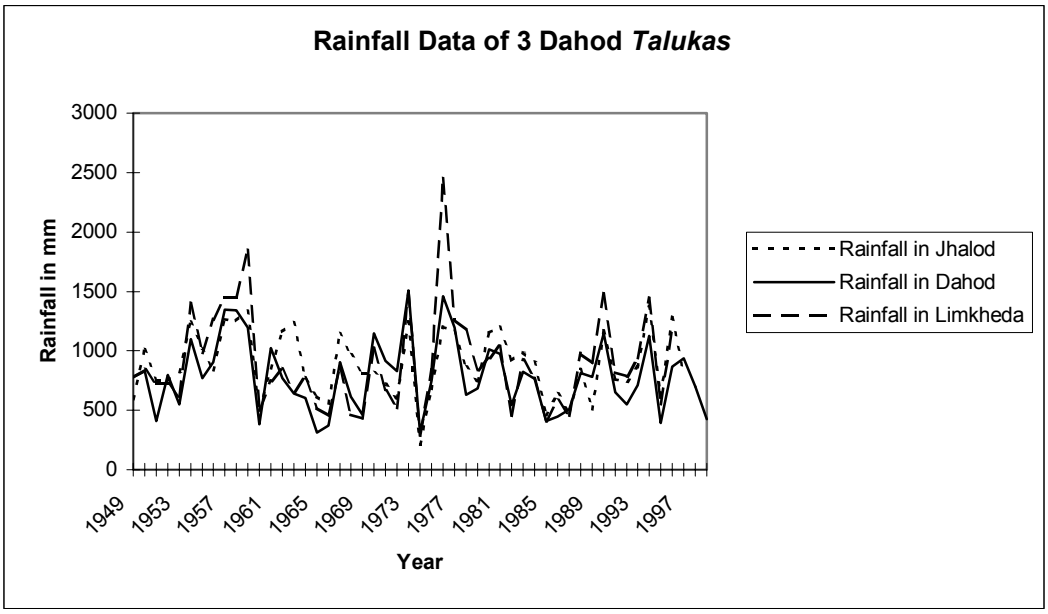


Figure 6: Rainfall data of the last 5 decades in three different *talukas* of Dahod

(Data source: Sadguru, Dahod)

Erosion

The landscape of Bhanpur can be described as hilly with dense vegetation in the forest areas and well developed crops in the fields. Erosion was evident only on the fields in the forest area (see chapter 5.3.3). These fields mostly had steep slopes and very shallow soils. The forest in this area is dense in terms of trees but the ground vegetation is very meagre. As a result during the monsoon season, erosion through water can take place. But erosion was not such a serious problem as in the other villages. Bhanpur showed the well-balanced dispersion of environmental conditions, except for the forest area.

The topography of Pada and Kotda shows high relief energy. In contrast to Bhanpur it is not a hilly region but a wide plateau furrowed by deep valleys. The geology mainly consists of slates. Erosion is obvious on top of the hills in the form of soil degradation down to the bedrock, especially in Kotda. Mainly secondary vegetation like grass and some shrubs were left in these areas. In addition, the situation got worse through overgrazing by the cattle. On the slopes, the situation was similar but additionally deep gully erosion has taken place.

Both villages have big areas of forest land. But in small zones in Pada, on very steep parts of the valleys, actual forest with dense vegetation is seen. Kotda is totally deforested and hence is unprotected to

erosion. As per information provided by an official of the Forestry Department as well as by the villagers, the deforestation mainly took place in the eighties. Since the last three to five years a reforestation programme has been implemented in this area. This programme includes a lot of measures for erosion protection like *nala* and gully plugs, check dams and reforestation. In the forests of the other villages, a number of structures like these had been developed by the Forestry Department.

In Kotda the fields lie in the surrounding area of the village mostly on uneven terrain. Most of the fields have some structures for erosion protection. It is the only village where a considerable amount of erosion protection measures have been undertaken on own initiative on private land (see chap. 5.3.3).

Water situation

The water situation in the villages studied in Dahod was very different from the water situation in Kachchh. All villages had resources of fresh groundwater. An obvious disparity here, as compared to Kachchh were the hand pumps for the supply of drinking water, provided by the Government and with access to the second aquifer (see below). These hand pumps ensure the availability of freshwater almost throughout the year.

In this region, three different aquifers can be distinguished. The first lies just a few meters under the surface depending strongly on the rain; the second again at 30 to 60 meters, but less fluctuating with the seasons and the last one from 100 meters downwards. This lowest aquifer is the one with the slowest recharge, but has the most equable availability; it always has water throughout the year. Because of this, farmers often consider this resource as unlimited and see the over all solution in deep bore wells for irrigation.

The main limiting factor for agriculture is the access to water. A distinction has to be made between the fields on the hilltops and in the valley. While the farmers in the valley can subsist for two cropping seasons in a year with a good monsoon due to irrigation facilities, the farmers on top of the hills usually do not have access to enough water resources for irrigation. Especially in Pada there is an obvious difference in wealth between these two areas.
In Bhanpur, the access to water, including drinking water, was different for the hamlets accessible through the road and for the hamlets in the forest. The hamlets within reach of the road had hand pumps, wells and ponds, whereas the hamlets in the forest had none of these facilities. In these hamlets so far, no development activities have

been undertaken. During the monsoon season the people get water from an ephemeral river. But by the end of the rainy season they have to dig pits in the riverbed up to 20 feet deep. During drought years they have to carry water from other hamlets; it entails a minimum of half an hour walking distance uphill through the forest. In the other hamlets as well as in Pada and Kotda, drinking water is usually available throughout the year even though some wells and hand pumps fall dry. But in some cases a longer walking distance becomes necessary.

Another problem that is observed is the hygiene of most of the structures concerning water. Not a single open well has been seen with a cover on top. So all kinds of pollutants from outside like organic matter and faeces of animals can get in. Even the development of algae can take place. At the ponds, the situation is even worse. All actions of daily life are seen to take place here. The people drink the water, do their washing, wash themselves and even the cattle get into these ponds resulting in different consequences.

Hand pumps provide the best standard in terms of hygiene. In all villages, few hand pumps have been installed. But the problem with this facility is similar to all the structures provided by the government free of charge, like ponds or field bunds. Nobody feels responsible for their maintenance.

In all three villages, apart from the people living in the forests of Bhanpur, the access to proper drinking water was a problem during drought periods only. The first need expressed by the people in the villages was, in most cases, the necessity of irrigation facilities. However the situation remains strongly dependent on the rain as long as no adequate conservation structures for water are developed.

5.3.3 The role and problems of agriculture, livestock husbandry and forestry

Cultivated crops

The main crops cultivated in the villages in Dahod for self consumption are maize and paddy. In addition, different types of pulses, like black gram (*Vigna mungo*) or pigeon pea (*Cajanus cajan*) are grown. If the production of pulses exceeds own consumption, the surplus is sold. For self consumption, some households have kitchen gardens, where they grow vegetables (chillies, cucumbers, pumpkins) and tobacco.

Usually, only one *kharif* crop can be cultivated per year. Rarely it is possible to cultivate wheat as a winter crop. Mostly, only the richest farmers of the villages have irrigation facilities and can thus cultivate two crops every year. Pulses are always grown on the poor, stony soils; maize and rice are grown on the better soils. Farmers do not practice any crop rotation, so they miss the benefits that would acrue from it.

Importance of agriculture

Farmers prefer agriculture to labour work or animal husbandry because they are convinced that agriculture ensures food supply for the whole year. Besides, with labour work they can earn small amounts of money only. The farmers informed the research team that they have had to migrate for labour work because of poor yields lack of irrigation facilities in the past ten years. They further stated that if they had irrigation facilities, they would like to diversify their production and intensify the cultivation of vegetables like chilli or fruits like papayas for cash purposes.

Erosion problems of the fields

Soil erosion is especially high on the fields with steep slopes. These soils are eroded to such an extent that only stones are left in the fields. Contour ploughing or cultivation along contour lines is not practised. Paddy fields, however, which are always located in the valleys, are surrounded by field bunds and thus do not have any erosion problems.

Need for agricultural extension

The fields are weeded at a very late stage, which means, that a decrease in yield because of weeds is unavoidable. The weeds are not used for feeding animals. However, the farmers feel, that they weed the crop at the right stage. Therefore, an appropriate agricultural extension, would be needed to improve the agricultural practices.

Livestock husbandry

The livestock kept in the sample villages are cows, oxen, buffaloes, goats and poultry. The milk and milk products from cows and buffaloes are in most cases used for self consumption only[27]. Poultry is kept for the market and in some cases for self consumption of eggs and meat. Goats are exclusively bred for the market. Dung is spread on the fields. A contrasting feature from Kachchh is that no dung is sold here. Unlike Kachchh almost nobody uses tractors for ploughing the fields, but every household has a pair of oxen.

[27] In the 2000 monsoon season the amount of milk produced by the cattle was in many cases very poor.

Wasteland management and forage supply

The wastelands of all sample villages are overgrazed and thus eroded. In addition, nomads from Rajasthan pass with their cattle through the wastelands of the villages. The farmers explain, that this does not cause any problems. However, if a very large number of cattle is passing by, the owners of the cattle need permission of the panchayat. In two of the three sample villages, people practised wasteland management whereby certain areas of the wasteland were not grazed. The fodder of these areas is cut during winter, when no other forage is available. However, this practice could be improved to make hay of higher quality if the grass would be cut before it is completely dry. In addition to the fodder from the wasteland, the cattle is fed with harvest residues and in some cases with weeds from the fields. In contrast to Kachchh, during a drought no fodder is provided by private donors. Only in some cases, is it possible to purchase forage from the Government.

Forestry

All households of the sample villages use the forest land for firewood. In two of the three sample villages, however, people had difficulty finding firewood, because the forests were almost completely deforested. In these villages, cow dung is now used in addition to the firewood. The trees of the forests are also used as wood for construction of houses. Furthermore, the cattle is grazed on the forest land. A big part of the forest land, however, is reserved for reasons of reforestation. Grazing the cattle in this area is illegal and punishable. Only cutting grass for the animals is allowed. It is worth noting, that the more the forest land is reserved, the greater is the pressure on the open forest land.

Land property situation

Because of the high growth of population, agricultural land in the villages is very scarce. Therefore, in some cases forest land is illegally encroached in the sample villages for cropping purposes. This land is often stony and of very poor soil quality. Often this land is located in areas with steep slopes and consequently exposed to heavy soil erosion. Because the encroached land is not the legal property of the farmers using it, they do not have any incentives to invest in erosion protection measures on this land. In some cases, however, arrangements made with the Forestry Department enable the farmers to become the legal owners of the encroached land.

Similar to the situation in Kachchh, some farmers are observed to be cultivating land taken on lease in order to increase their agricultural production. This land is leased out for different reasons: One is that money is urgently needed, for example for a wedding in the family.

Another reason can be that the farmers do not have the facilities to irrigate or to keep the land fertile. Thirdly, land is leased out by people who migrated permanently to urban areas.
The only information about the conditions of leasing is that the seasonal or yearly leasing rate usually depends on the yield of harvest. Or a fixed price is dealt for a defined period. About the usual leasing period nothing can be said. It seems that this depends on the profit for the tenant.

5.3.4 Socio-economic characteristics and problems

Settlement patterns and population

Unlike in Kachchh, the houses in the villages of Dahod are scattered in different hamlets over the entire area of the village. The number of hamlets varies with the size of the village. There is no pattern as to how the fields are dispersed in the total area of the village but some families have fields adjoining their houses. Differences between and within the three villages concerning their accessibility are considerable. Two villages are easily accessible whereas the access to one village (Pada) is characterised by crossing a riverbed (broken bridge) and steep slopes with loose rocks. Within Bhanpur and Pada the distance from different hamlets to the village access road varies considerably. Some far off hamlets in Bhanpur lie up to two hours walking distance away from the village access road.
The population of the three sample villages consists mainly of tribals. People of the same or of different tribal origins live in one village. According to the District Census Handbook 1991, in Bhanpur and Kotda the entire population belongs to Scheduled Tribes, whereas in Pada, only half of the population belongs to Scheduled Tribes (DIRECTOR OF CENSUS OPERATIONS, 1992b, pp. 609, 645, 657). The people of all three sample villages are Hindus. Both joint family and nuclear family concepts are common.

Economic activities

As in Kachchh, the most important economic activity in a good monsoon season is agriculture. For farmers as well as for agricultural labourers this is the essential source of income. Livestock (goats and poultry) and different crops (see chapter 5.3.3) are sold. In Pada, the families of one hamlet also sell the milk produced by their cattle. This was not seen in any other hamlet or village.

An important non agriculture related economic activity, equal to that of Kachchh, is labour work seen, for example, in construction work and in carrying loads. Very few villagers are engaged in specialised

professions such as carpentry and tailoring, or those which require investments such as shop-keeping and milling service. As seen in local markets, pottery is widespread in the region. However, no potters were found in the three villages. Unlike in Kachchh, handicraft does not play any role in the villages studied.

Like in Kachchh (see chapter 5.2.4), in Dahod too, construction work on common properties organised by the government is a common way to make a living especially during drought seasons. Nevertheless, people have to migrate because the demand of workforces is not regular and is not sufficient for the village population. For making a living many families rely on various sources of income (see chapter 5.2.4).

The income is spent on seeds, livestock for raising purposes, additional food items and other household items. The situation concerning the availability of government supported fair price shops is the same as in Kachchh (see chapter 5.2.4). People stated that they preferred buying at the fair price shops, but distance being a problem, they usually buy from the private shops in the villages.

Migration

Seasonal migration is even more prevalent than in Kachchh and has also increased in the past years in all three villages. Many people migrate between the cropping seasons to other rural[28] or urban areas in order to make a living, for instance, in construction work as daily wage workers. Usually, elderly family members and children stay in the villages to take care of the families' belongings and the cattle. In Kotda, the extent of migration is even higher. Many family members (males and females) have migrated permanently and only come back at festival times (*Diwali* in October, *Holi* in March). In between, some people come back with money or goods for those family members who stay in the village.

Health

In all three villages, the health situation was mainly poor but differed considerably within the population of a village, depending on the economic situation of the family. The consumption of milk and milk products is lower than in Kachchh as hardly any milk is produced here. Consequently, the average prevalence of malnutrition is even higher than in the villages visited in Kachchh. This happens inspite of several

[28] Several villagers stated that people also migrate to Saurashtra (south-western Gujarat) to find work in cotton plantations.

families, especially those who own poultry and/or goats, consuming eggs and meat occasionally (e.g. at a festival, a birth).[29]
At the time of the study, vegetables (cucumbers and pumpkins) were conserved (dried) for later consumption, including for the dry season.

The staple foods in Dahod are maize and rice which are cultivated in the villages, and wheat which is purchased. Different pulses serve as the main protein source (see chapter 5.3.3) if they are available.

In all three villages there are hand pumps (installed by the Government) which provide at least parts of the villages with drinking water of good quality. Nevertheless, people have to take water from open water sources when the hand pumps are dry, not working anymore or are too far away. The latter applies especially to far off hamlets. Consequently, the same water-related health problems and diseases as in Kachchh (see chapter 5.2.4) exist in Dahod.

Simple *chullahs* run with firewood (and cow dung) for preparing food are as common as in Kachchh with the same consequences for health (adverse reactions to eyes and lungs). In one village, bio-gas was used by some villagers as a minor energy source.

In all three villages, for safety reasons[30], people live together with their animals in the same house. The strong ammonia smell of the excrement adversely affects the health of the people.

As in Kachchh, in none of the three villages, a public health facility is available. In Bhanpur, there is a private health facility where people can get basic treatment (e.g. injections against fever, medicine against cough, iodine for cleaning wounds). For this, the people have to pay but the rates are set according to their economic situation. In case of more serious health problems (e.g. severe fever, broken limbs, birth complications) people have to go to the next village (public health facility) or even further away (public or private hospital). For the far off hamlets the problem of adequate health provision is even more serious.
As in Kachchh, no practised indigenous medical knowledge was found in the villages.

Education and Literacy

In each of the three villages, primary education is provided. Nevertheless, only a minority of children attend school. Besides the

[29] In this context, it has to be stated that the majority of the people do not, according to their religious belief, consume either meat or eggs.
[30] People stated that cattle robbery and attacks by wild animals are common in the region.

reasons mentioned in chapter 5.2.4, the distance and the condition of the paths to the schools are a problem. Even in Pada, where two primary schools exist in different hamlets, not many children attend school. The gender bias in child education is even stronger than in Kachchh; the proportion of girls attending school is very low. An explanation for this is that, compared with Kachchh, the workload of girls is much higher than the workload of boys.

Illiteracy among adults in the three villages is as grave a problem as in Kachchh. The gender bias is even more evident than in Kachchh.

Alcoholism

The abuse of home made liquor is widespread in the tribal areas of Dahod. Mainly men prepare and drink this alcohol. It was observed in the villages that many men were drunk even during daytime while the women and their children, especially the girls, were burdened with the full workload in the house and on the fields.

5.4 Comparative assessment

5.4.1 Sub-Groups and their specific situation

The view of different subgroups and their situation in a village is important with regard to the goals of participation and equity in a rural development programme. This is very important in the watershed approach also. The reason for describing the specific situation of the subgroups listed below is that those were identified as important groups with different interests. These must be taken into consideration as stakeholder groups in a watershed development programme.

Subgroups for this study are defined as groups with different cultural or socio-economic characteristics and/or different access to water and land resources.

During our target area analysis, the research team found different subgroups living together in the villages of Kachchh and Dahod district. In Kachchh district, the presence of social groups in the villages varied from village to village. The presence of different social groups can determine whether or not they work together. In Dahod district, the village population is more homogeneous concerning social groups. As the majority of the population belongs to tribal groups, they work together in a better way. These are some of the important interest groups or stakeholder groups encountered in both districts.

Women and girls

Agriculture (weeding and harvesting) and housework (collecting water 5 to 6 times daily, collecting firewood, milking the cattle, cooking, child care, etc.) are the main occupations of the women and girls interviewed[31]. Handicrafts, traditionally made by Darbars in Kachchh district but also made by some Harijans and Rabaris, is a contribution to the household income. In some cases they also prepare milk products like *mava* which are sold to shops in the next town. When they migrate to urban areas, the women work along with their men at construction sites. However, they earn less money for the same work. In addition to this, they are exposed more to bad health and nutrition conditions than men (for example, during pregnancy and lactation, smoke of simple *chullahs* while cooking). Sadly, the majority of the girls cannot attend or finish even primary school, because their parents do not see the long term benefits of the girl's education.

Men and boys

Agriculture (sowing, ploughing and harvesting) and rearing cattle are their main occupations. Cutting trees for firewood is their unique contribution to the housework. Selling and buying different products in the local market also belong to the main responsibilities of men. In some cases they have additional sources of income i.e. they work as tailor or carpenter. Boys are at an advantage concerning education, because in several cases they can attend primary school and also in some cases finish secondary school.

Hindu communities

- Brahmin: They have the role of priest in the villages. As they take care of the temple, they are allowed to use land which belongs to the temple[32]. In a case observed in Kotda, Brahmin do not work on their fields but use the land for rearing cattle. There they have an income through a small store, where they sell mainly sweets. The Brahmin are a privileged group because they are respected by all other Hindu communities and go to all households, except that of Harijan.
- Darbar and Sodha Darbar: Traditionally, they are landowners of extensive land hectares for agriculture purposes, i.e. agriculture is the main occupation for men of both social groups. Traditionally Darbar women do not leave the village alone or work on the fields. In Kachchh district, they make handicrafts as their main economic activity. Sodha Darbar women, however, work in the fields and in some cases assume all responsibilities of their fields and household

[31] Only Darbar women do not work in agriculture; see section Hindu Communities of this chapter.
[32] In other villages they have their own land and work in agriculture.

when their men migrate to urban areas. Both groups have an important position and political influence in the decision making process in the villages where they live.

- Rabari: They are considered as backward castes. Usually they live in very poor economic conditions, but in the village visited by the study team, where Rabari lived, their economic situation was very heterogeneous. Rearing cattle is their traditional occupation. They earn money by taking care of cattle belonging to other farmers and by selling wool and milk in the local markets. Furthermore, agriculture is their second important economic occupation. They work on their own land and in cases where they are landless, they can apply to get some subsidy by the Government to buy land. Most of the time this social group has problems with other social groups in the village because they wish to work for their own interests only and do not collaborate with other social groups.
- Koli: They are considered as a backward caste. Agriculture and rearing camels for transportation are their main occupations. The camels belong to the Koli community and are rented for transportation purposes within different villages. They also work on their own land. Those Koli who are landless can apply to get some subsidy by the Government to buy land.
- Harijan: Agriculture is their main occupation. They work in their own fields and as daily labourers in other's fields. They belong to the lower group formerly considered as "untouchables" among the Hindu communities. For this reason, even today, they are very often victims of a strong discrimination among other groups in the village. An example of this discrimination is their difficulty in getting access to water resources in the village. They can drink water from the same pond as the other groups but they can not drink water from the same well. Women from this group must suffer a double discrimination, as women and as Harijan. They get priority to receive financial support from the Government to buy fields, to build houses and for higher education.

  As seen in one village in Kachchh (Dhokda), the Harijan minority received food from Darbar but was not integrated in the village life, especially not the women. The Harijan women could take the water from the same pond but had to take another longer path to the pond. In comparison to this, the Harijan community in Atdo where they make up about one third of the population, are those who have taken a lead in uplifting the village they live in. Nevertheless, the latter example still has to be seen as an exception.

Tribal communities - Adivasi

The different tribal groups live principally in Dahod district. Agriculture is their main occupation, but they also rear cattle and poultry as

secondary activities. While on the one hand tribal women enjoy more liberty than women encountered in Kachchh, on the other hand they are burdened with the full workload in agriculture and in the household.
Damor: Agriculture is their main occupation but they also rear cattle and poultry in order to sell them. They work on their own land and in those cases where they are landless, they can apply to the Government to get some subsidy to buy land.
Bhil: Agriculture is their main occupation but they produce only for survival. They can apply to the Government to get some subsidy to buy land. They live in very poor conditions as regards their health, education, etc.

People of other religions: Muslim

Agriculture is their main occupation and they work on their own land or as labour workers in the fields of other farmers. If they do not have land and live below the poverty line, they can also apply to the Government to get subsidy to buy land. In the observed sample villages they lived in very poor conditions. Generally they have good relations with the other social groups in the village.

Landless people

They are landless as a consequence of migration to the area and a high population growth in Dahod district. They encroach land in the forest area. They are allowed to build their houses there but officially, they can not cultivate the land. They live together in communities and do labour work in the fields of other farmers. They represent the poorest subgroup met. Their main focus is the daily work necessary for survival. Their strongest wish is to own land. The landless people interviewed stated that they can not see any advantage for them out of a watershed development programme. Generally, they have good relations with other groups in the village.

Richer farmers

The richer farmers normally have access to irrigation facilities either because they live near a river or a pond and can afford a diesel pump, or because they have their own bore well. With the help of these irrigation facilities they are able to cultivate more water consuming cash crops like groundnut, and they can cultivate a second crop (*rabi*) too. They normally have the best constructed house of the village, and do not have to migrate like the other farmers. If poorer farmers need money, for example for a marriage, the richer farmers take their land

on lease. In addition the richer farmers and their relatives have other income sources out of labour work from outside the village.

Farmers in the main hamlets

They are farmers in Dahod district, who have good access to hand pumps, electricity, shops, schools and primary health facilities. Besides, they live near the main roads and have more facilities to transport their products to the local market.

Farmers in the distant hamlets

They are farmers in Dahod district, who live in very poor conditions and do not have access to facilities like hand pumps, electricity, shops, schools or primary health centres. Communication with the other hamlets is difficult, because they often belong to a different watershed as the main hamlets.

Farmers with political power

The *sarpanch* and all his relatives and also richer farmers often use political power and influence for their own benefit and interests. Farmers, who have good relations with the *sarpanch,* get facilities like hand pumps or bio gas sooner than the other farmers of the village. Other farmers with political power are those farmers who have connections with politicians, with members of the Legislative Assembly or are party workers at village level.

People with other income sources

Shopkeeping is one important economic activity in the villages observed. In some cases, for example in Atdo or Pada, the shopkeepers are occupied in selling products in the shop. They also work in their own fields. In other villages (Laiyari and Bhanpur), shopkeepers are persons that do not have their main residence in the village, have stayed there for a short period of time (Laiyari) or come daily for work (Bhanpur). Although he had lived in the village for a short time only, the shopkeeper in Laiyari was very interested in working for the upliftment of the village.

Tailoring and carpentry are other economic activities that the research team could find in the villages observed. In Dahod district, one mainly met farmers who were working in the fields and as tailor or carpenter.

5.4.2 Communication and decision-making

The reason for analysing the communication and decision making process in the target area is important for a watershed development

programme in order to know how the different stakeholders communicate and to know how the decisions are made among them.

Communication can be defined as the process in which people come together to exchange ideas and information on matters of common interest. Decision making can be defined as the process, in which people discuss all types of common problems in a meeting and come to a definite set of decisions about how to solve them together. A good communication and a good decision making process can be understood in this study as the process in which all social groups from one village exchange information, discuss about common matters and solve them together. For example, they can discuss about the need of a new school building for their children and decide to build one together. The study of the sample villages in both districts has revealed a positive correlation between communication and decision making. In most cases, good decisions are made only after a good communication has taken place.

In Kachchh district, communication among members of the same social group (e.g. Darbar, Rabari, Koli) was found to be good. But this does not necessarily apply to the communication between different social groups. In Dhokda, communication between the Darbar , who represent the majority in the village, and the Muslim minority is good. The Muslim woman for example, as the midwife in the village, is respected and invited to all meetings. In Laiyari and Atdo, the distribution of population among the different social groups was approximately equal. Nevertheless, the quality of communication varies from one village to the other. In Atdo, the different groups respect each other and communicate when they feel it is necessary; for example Harijan and Darbar come together to decide common issues like labour payment. In Laiyari, where the distribution of social groups was also equal, the communication is poor between two of the three groups. Koli and Harijan communicate among themselves but there is a general mistrust for the Rabari.

The **decision making** process in Dhokda was good. It was observed that all decisions were made collectively. Villagers come together, discuss their problems and the final decision is made by a group of 5 to 6 elderly farmers. In villages, where the distribution of population between all social groups was approximately equal, the decision making patterns varied greatly. In Atdo, when they have meetings, one person from each social group of the village must be present to vote. On the other hand, in Laiyari they could not come to a common decision. They could not elect one common leader for an important

watershed project, who would be needed for the project implementation.

In Dahod district, the geographical distribution of the various hamlets in the villages hinders communication and the decision making process among farmers. In Bhanpur, good communication was found among villagers from the same hamlet and also among villagers from neighbouring hamlets. Farmers from two hamlets came together and decided to build a common pond to increase their water supply. At the same time, the remaining hamlets are situated quite far from each other and can communicate with difficulty. The forest hamlet for example, is situated so far away from the others, that farmers can get important information and the news about the village only if they go shopping into the main hamlets once a week. As a consequence, they can not take part in the village meetings regularly. For example, they were not informed about the plan to get hand pumps and so could not order one. A special case is Kotda, where the village consists of one hamlet and the population belongs to the same social group, Damor. Good communication and decision making between farmers was observed. When they realised that the soil of their fields was getting washed away into the valley, they decided to organise themselves and build *nala* plugs together. It was also observed that landless people have good relations and communication with the other farmers. They are invited to social events as well as to the meetings and they can also give their opinion for solving common problems.

It was particularly interesting to note the role of women in the decision making process. The study of the sample villages in both districts has revealed a positive correlation between decision making and education levels. Those women with higher education levels were consulted about their opinion and seen to discuss different issues with their men. However, the final decision was taken by the men. Women with lower education could only make decisions about their own households (Kachchh) or discuss with their men about household and agriculture problems (Dahod), but the final decision was made by the men. Men also participate more than women in the political life and the decision making process in the village.

Sadly, a good communication and collective decision making process among the various social groups of the village does not guarantee that the panchayat and the *sarpanch* support their demands. Frequently, the *sarpanch* places his personal interests ahead of his formal governmental duties. In Pada and Bhanpur, for example, those hamlets where the *sarpanch* and his relatives live, had hand pumps built sooner

than in the other hamlets. Sometimes, when 4 to 5 villages belong to the same panchayat, only the village where the *sarpanch* lives gets benefits like hand pumps, proper medical care, etc. In Kotda, for example, people had to wait for a long time for the money they had earned from the government.

5.4.3 Problem awareness and coping strategies

The awareness of problems, within the villages studied, varies from village to village. Between the two districts selected, however, there was not much difference in awareness levels.

In one of the sample villages (Kotda), people had a comprehensive knowledge of the factors leading to resource degradation. In this village the connections between heavy rainfalls, erosion, deterioration of soil quality and soil moisture as well as the decrease of agricultural yields were known. Furthermore, these people made a connection between deforestation and a decrease in the amount of rainfall. In this village, people had made attempts on their own to prevent field erosion. This fact was remarkable, because in this village there were no NGO activities so far. People considered their knowledge about resource degradation as "common sense".

However, in most cases there was no connection made by the people between soil erosion and soil quality, even if the erosion problem was obvious. These people considered the lack of rain or a decrease in the amount of rain in the last decade as the only problem of their fields.

Similarly, only few persons were aware that the quality of the wasteland is deteriorating because of overgrazing. According to the perception of most of the people the wasteland quality depends only on the amount of rain, and not on the amount of cattle on the wastelands. People in the villages were aware of the connection between the amount of rainfall and the amount of water in the wells (dug wells as well as hand pumps), but nevertheless they considered the amount of water available for irrigation in the underground as unlimited. According to them, the only constraint was lack of resources to invest in bore wells.

In one of the villages where entry point activities for a watershed development programme have already been undertaken by an NGO, the people seemed to have learned to demonstrate awareness. This means that they stated only those problems, which the NGO had identified and addressed in the village. However this can not be seen as a real awareness problem.

In all villages studied, people considered their illiteracy as a big obstacle for the village development. They said that they face difficulties, because they can forward their proposals for village improvement to the panchayat only orally. Because of this their proposals are not considered seriously. Furthermore they felt the need to bribe, otherwise they can not ensure that their demand has been written down. However, even this awareness of problems faced due to illiteracy does not motivate many people to send their children to school (see chapter 5.2.4).

To cope with their problems, different villagers used different strategies. In some cases they undertook initiatives on their own to prevent soil erosion on their fields and to harvest rainwater at the same time. These farmers have built field bunds or *nala* plugs on their own. Another remarkable initiative was that farmers maintained government structures, like field bunds, which have been constructed under drought relief programmes.

Another coping strategy seen in the villages, was that people organised themselves to make a demand through the panchayat to get any support of the Government, like installing hand pumps for several hamlets of the village.

In all sample villages, people combined agriculture with periodical labour work outside the village to supplement their income during drought years. But even in the village itself certain people found additional sources of income through shop-keeping or running a flour mill. In addition to agriculture, a few people also worked as carpenter and tailor. In villages where handicraft activities were not organised by an NGO, villagers tried to sell some handicrafts on their own. An additional source of cash income, seen in some cases, was the sale of processed agricultural products like *mava*.

In agriculture people tried to diversify their production. This means, that the agricultural households mostly did farming as well as animal husbandry with several species of animals. In the fields the farmers practice mixed cropping with up to five crops. This strategy is used to minimise the risk of crop failure in case of drought. By using this strategy they hope to harvest at least one crop.

Another way of risk minimisation in agricultural production, recognised in all sample villages was to minimise the inputs in crop production. This way, the risk of losing the money invested in the crop production,

in case of a crop failure in drought years is minimised. This means, for example, that the farmers would rather sell the dung than spread it on the fields. The farmers mentioned, that if they invested in erosion protection on their fields, they would have to do unpaid work, which meant a lack of income from labour work, which they could not afford.

A way to cope with problems present in all villages, was the "learned helplessness". People stay passive and wait for help from outside, like financial support from the government.

However, below a certain level of poverty, the motivation for taking initiatives on their own was very limited and the main focus was put on the daily work necessary for survival. These people have resigned themselves to their fate.

5.5 Interrelations of the problems at village level

In order to summarise the problems and requirements described in the previous chapters of the target area analysis, figure 7 aims at giving an overview of these problems and their interrelations. As shown in the figure, none of the problems can be regarded separately from the others, which means that the problems at the village level lead to a vicious circle. The figure starts with the population pressure and the resulting pressure on natural resources in general. But as water is the core element of the problems in all the villages studied, the lack of water can be seen as one starting point of the vicious circle. The absence of water harvesting methods enlarge the lack of water. Due to frequent droughts the agricultural yields as well as the groundwater table and the surface water resources decline. A second important starting point is the shortage of agricultural land. In connection with the absence of erosion protection measures this leads again to a faster degradation of the land and water resources.

The final results of the problems are migration, lack of future perspectives, resignation and waiting for help from outside (see chapter 2.3).

The absence of social coherence and communication as well as the lack of problem awareness in the villages have an additional influence on the situation; due to this no activities are undertaken on their own initiatives. By undertaking watershed development activities to solve the central problems the vicious circle can be broken and people can be given the possibility to stay in their village and make a living there – until the natural resources are exhausted again due to the population pressure.

The big potentials at the village level can be seen in the fact that the people want to stay in their village and that they prefer to do agriculture. Furthermore it is a fact, that if there is good communication within the village, people are active in undertaking activities on their own to improve their situation.

Figure 7: Interrelations of the problems at village level

6 Capacity Building in Watershed Development

6.1 The different aspects of capacity building

Capacity building can be defined as the process of integral personal development of individuals and/or groups in order to achieve changes in attitude, behaviour, skills and knowledge in relation to a specific problem.
This process of capacity building consists of two phases: first, enhancing individual and group awareness; second, training and education in technical and other issues related to the problems and needs of the group.
The whole process of capacity building requires that the people are aware of their problems and needs at the individual level as well as the group level.
Awareness about problems and needs should lead the individual to a level from where he can organise himself to take decisions towards a change. People should be aware of the fact that they themselves have the capacity to bring about any social change. For this, they have to assume responsibility on the individual and group levels.
Accordingly, the individuals organised into groups must take concrete actions to solve their problems. After individuals have carried out the action, they can objectively evaluate the resultant changes in their problem, reflect on the situation and realise their own self esteem. This awareness is the basis of effective training and education in technical, social, environmental and other areas related to the problems and needs of the group.
In the following chapter, the different aspects of capacity building and the requirements on village, PIA and management level are explained and the existing capacity building institutions analysed.

6.2 Requirements in capacity building

6.2.1 Requirements at village level

Requirements in capacity building at village level, which should be met by the Watershed Development Programme, were observed in various fields. As far as the agricultural and technical side is concerned, the requirements are as follows:

- Creating awareness concerning environmental problems and their causes. Although in some villages the population was quite aware of problems, like the erosion of soil and the degradation of natural

resources, this was not always the case. Often, a lack of knowledge about the connection between causes and impact of environmental degradation was observed; for instance, the link between the condition of wasteland and the ratio of livestock and available grazing land.
- Creating awareness that water is a limited resource. People have to rethink about their usage of water, for example, water logging caused by faulty irrigation practices, or the waste of water caused by the inadequate usage of drinking water pipelines (see chapter 5.2.2).
- The transfer of knowledge about sustainable agriculture systems and methods, like appropriate crop rotations.
- The requirement of consultation concerning the improvement of wasteland management in order to increase fodder production.
- Generating responsibility, ability and willingness to maintain the structures completed.
- Generating an awareness about the fact that large and costly structures such as check dams are not the ultimate and only solution to conserve natural resources, but even small and unspectacular measures, like contour bunds, afforestation, vegetative field bunds, etc. have important contributions.
- Keeping up an adequate standard of hygiene, especially in regard to drinking water wells and other water tanks.
- The elaboration of accountancy.
- Consultation in marketing strategies for local manufactured products, such as handicrafts and dairy products, possibly through establishment of cooperatives.

Concerning capacity building in social fields, the following requirements were identified:

- The creation of the consciousness that watershed development concerns the entire watershed population. All subgroups should get benefits to induce social cohesion and to ensure sustainability.
- Strengthening of a common identity of the watershed population, especially where castes, tribal groups and other social groups are concerned. To reach a higher degree of a common identity is important to ensure the cooperation among the villagers and therefore the sustainability of the development efforts.
- The establishment of a platform and patterns of communication in the watershed, in order to find a common strategy for fighting environmental and social problems. This also includes the creation of a networking system among existing village institutions.

- The creation of political awareness, to check the power cells such as the village panchayat from misusing its power.
- The generation of self initiative and responsibility.
- The building up of gender awareness, as far as the workload and the access to environmental, economic and political resources of both sexes are concerned.
- The empowerment of the watershed population as an integral whole, as well as of the different subgroups.
- Generating management abilities.
- The transfer of knowledge about other ongoing rural support shemes.

The technical and social requirements of capacity building are of equal importance, whereas the capacity building in social aspects is the precondition for the implementation of all technical measures.
Further more, the local environmental, socio-economical and political conditions of each district and each village demand capacity building in different aspects. In caste dominated villages, for instance, it is imperative to build up an awareness for more social cohesion and cooperation. However, in the homogenous but more backward tribal areas, empowerment is a more challenging task. Therefore, a detailed knowledge about the target group of a particular watershed at the PIA level is important (see chapter 6.2.2).

Nevertheless, not all of the requirements in capacity building which exist at village level can be covered by the Watershed Development Programme. Other outstanding requirements observed are mainly in the fields of education and health. Literacy, as an important aspect of empowerment, is enabling people to get in contact with the outside world, to gather information about other on-going support schemes, and to fill out application sheets by themselves. Still, many parents do not see the importance of sending their children to school. Further more, a lack of both, awareness and knowledge, concerning the issues of health and hygiene was observed. It is therefore important to establish linkages with other governmental support schemes, which could bridge these gaps.

6.2.2 Requirements at PIA level

The watershed development approach demands a lot of skills and tasks from NGOs. An NGO, which wants to implement a watershed project successfully, must, first of all, understand the philosophy and the objectives of the watershed approach. Hence, NGOs must be aware that watershed development requires both social and technical

competencies. In addition to the technical knowledge about soil and water conservation, afforestation, animal husbandry, agriculture and pasture development, NGOs need to be firm in social fields like community organising and mobilisation, participatory approaches and empowerment of marginal groups. A sound knowledge about the physical environment of the project region is as much required as intensive contacts with and knowledge about the target group. An NGO must be able to identify the needs of the target group in order to develop adequate strategies which satisfy the needs and problems of all subgroups. If the identified needs cannot be met within the watershed approach, NGOs should know about possibilities to link people to other schemes and programmes. Finally, NGOs should be able to undertake qualitative monitoring in order to measure social and qualitative achievements.

As it was discussed in chapter 4.3.4, none of the NGOs in Gujarat fulfil all these criteria to an equal extent. It could be frequently observed that NGOs had a bias either on technical or on social aspects. None of these put an equal emphasis on both the fields. Those NGOs which are quite strong in technical issues often show shortcomings in the social part of implementation. On the other hand NGOs leaning towards social aspects, such as community organisation or empowerment, sometimes lacked in the technical part of implementation.

Nevertheless, the watershed approach, its philosophy and objectives are in general well known by the NGOs. This is due to the fact, that many of them already have more than five years of experience in implementing watershed projects. Generally, NGO staff have already attended training courses about watershed development and related issues. Due to the good NGO networking system, NGOs are, in general, quickly informed about the latest achievements in research concerning watershed development.

As a consequence, a comprehensive capacity building concerning watershed development for NGOs in Gujarat is not necessary. The shortcomings and weaknesses of NGOs, which could be sporadically observed in particular technical and social fields don‘t require a basic introduction in the watershed approach, but rather specific training in isolated fields. This could then be, according to the requirements, training courses in participatory approaches or community mobilising as well as in technical issues like the construction of check dams.

It could be observed that there is still a crucial need for further training in the fields of wasteland development, animal husbandry and

pasture development. Very few NGOs have adequate skills to take up the treatment of wastelands or common lands in their projects, a fact, which tends to exclude landless of the project. It was also noticed that many NGOs did not have clear strategies on how to involve the landless and other marginal groups in their projects. Income generating measures in non-agricultural fields were rarely introduced, and the establishment of SHGs was often neglected. As a result, almost all NGOs need further capacity building in this field.

Very few of the NGOs observed applied qualitative monitoring systems during the project implementation. Most of them were not aware of the importance of such a system. In order to attach more importance to qualitative and social achievements of projects, NGOs must be sensitised about the importance of qualitative monitoring systems and further training and capacity building has to be provided to them.

Finally, it has to be pointed out that many NGOs need more awareness building concerning the composition of their own staff. It could be noticed that some NGOs had neither female staff nor social scientists. In order to improve the effectiveness of their work, more awareness building in this field is necessary.

6.2.3 Requirements at programme management level

To assure a successful implementation of the IGWDP, capacity building requirements have to be met not only at NGO and village level, but also at the programme management level.

First of all, certain management skills and an adequate know-how in accountancy and financial management are required in order to coordinate the programme. As the institutional arrangements of the IGWDP are still to be discussed (see chapter 7.1), it is difficult to be precise about the extent of the management skills required. The latter depends on the organisational structure of the IGWDP and on the functions, detailed tasks and competencies a coordinating institution has to perform within this structure.

Some basic competencies needed at programme management level, regardless of the institutional arrangements, are summarised below:
Above all, a common and comprehensive understanding of the philosophy and the objectives of the watershed approach is required. It is most important that all team members at the programme management level have the same idea of what the watershed approach means, and how it is to be realised. Furthermore, the management team must have a detailed knowledge about NGOs in Gujarat which are

working in the field of natural resource management. It is, moreover, important that a common understanding about the skills and tasks required at PIA level is built up in order to implement projects in a successful and sustainable way. There should be a special awareness about the significance of social skills which are of as much importance as the technical competencies of NGOs. In order to select "good" NGOs for the implementation of projects, the programme management must be able to identify their strengths and weaknesses. For the assessment of NGOs, criteria have to be developed which take into consideration social as well as technical aspects. For all these tasks profound technical and social knowledge is needed.

In addition, awareness about the requirements of NGOs concerning capacity building has to be built up. The management team has to be in close and permanent contact with the NGOs.

To assure more sustainable projects, the programme management has to be aware of the importance of qualitative monitoring systems. Therefore, adequate and competent staff to undertake and supervise qualitative monitoring is required.

6.3 Existing capacity building institutions

6.3.1 Training institutions of NGOs

This section gives an overview of selected capacity building institutions, able to meet training requirements at PIA and programme management level. A large number of smaller NGOs are also engaged in capacity building at village level. It would go beyond the scope of this study to enumerate them all in this chapter.

Development Support Centre (DSC)

Based at Ahmedabad, DSC is a support NGO working since 1994 on the issues of participatory irrigation management (PIM), watershed development and related aspects. Besides providing support to other organisations, it has its own projects too. The senior office bearers of DSC are members of the national and state level forums on watershed development, Participatory Irrigation Management (PIM), JFM etc. DSC is one of the three organisations, selected by the Department of Rural Development, Government of Gujarat, to train Watershed Development Teams (WDTs). It has been given responsibility for Saurashtra region and Gandhinagar district where one month training courses of WDTs are conducted regularly. Besides that, it is also a training agency for Council for Advancement of Peoples Action and Rural Technology

(CAPART), Government of India to carry out basic training courses on watershed development, as a part of CAPART's support to voluntary organisations.

Training is provided by a DSC-based training team and other resource persons. DSC hires premises for providing training but provides the teaching material and other aids required for training.

N M Sadguru Water and Development Foundation

Based at Dahod in Gujarat, Sadguru is an NGO working for about three decades on the issues of water resources management, watershed development, wasteland development, agricultural extension, credit, women empowerment, income generating programmes and related aspects. It organises institutions of local communities, including women groups and builds their capacity to take up these projects. Besides direct implementation, it has established a well equipped training centre. Its senior office bearers are members of the national and state level forums on watershed development, JFM etc. Sadguru is one of the three organisations, selected by the Department of Rural Development, Government of Gujarat to train WDTs. It has been given responsibility for eastern and southern Gujarat. One month training courses of WDTs are conducted regularly whereas other programmes in the areas of watershed development, JFM, agriculture extension, bio-gas, credit etc. are offered on demand.

The Sadguru based training team and additional resource persons provide the training sessions which are held in their own premises. There also, residential training can be conducted. The required teaching material and other aids are also provided by Sadguru.

Aga Khan Rural Support Programme (AKRSP) India

Based at Junagadh, Bharuch and Surendranagar districts in Gujarat with Head Office in Ahmedabad, AKRSP is an NGO working for about two decades on the issues of water resources management, watershed development, wasteland development, agricultural extension, credit, women empowerment, income generating programmes and related aspects. It organises institutions of local communities, including women groups and provides capacity building in order to enable the groups/communities to take up these projects. AKRSP considers watershed as a unit of development. Besides direct implementation, it has established AKRSP services to provide training and other support to different development organisations. It has specialised in the training on PRA and Gender. Training courses are conducted mainly on demand. People from other organisations come for exposure visits to learn from

its work. Its senior office bearers are members of the national and state level forums on watershed development, JFM etc.

Training is provided by the AKRSP based training team and additional resource persons. It uses its own premises for conducting training courses. However, the infrastructure is not enough to provide residential training. Teaching material and other aids required for training are available.

Vivekanand Research & Training Institute (VRTI)

Based at Kachchh district in Gujarat, VRTI is an NGO working for about two decades on the issues of water resources management, watershed development, wasteland development, agriculture extension, credit and related aspects. It organises institutions of local communities and builds their capacity to take up these projects. VRTI considers a watershed as a unit of development. Besides direct implementation, it provides training and other support to different development organisations. It has specialised in the training on agriculture extension, watershed development, water resources development etc. Training is conducted mainly on demand. Exposure visits are organised so that people from other organisations come to learn from its work. Its senior office bearers are members of the state level forums on watershed development, rural development etc.

VRTI provides training through its own training team and additional resource persons. Training, also residential training, is conducted in VRTI-owned premises and with own teaching material and additional aids.

Bhartiya Agro-Industry Foundation (BAIF)

BAIF is an NGO working for about two decades on the issues of water resources management, watershed development, agro-forestry, animal husbandry, horticulture, agricultural extension, credit and related aspects. Besides direct implementation, it provides training and other support to different development organisations. It has specialised in the training on agriculture extension, watershed development, animal husbandry, horticulture, credit etc. Training sessions are conducted mainly on demand. People from other organisations come for exposure visits to learn from its work. Its senior office bearers are members of the state level forums on rural development etc.

A BAIF-based training team and additional resource persons provide the training that is conducted in its own premises and with own teaching material and other required aids.

6.3.2 Government training institutions

State Institute of Rural Development (SIRD)

Based at Ahmedabad, SIRD is an GO working on the issues of water resources management, watershed development, wasteland development, agricultural extension, credit, women empowerment, income generating programmes and related aspects. It provides training in these aspects to different organisations. At the district level, training programmes on these aspects are also carried out by/through the District Rural Development Agency (DRDA). The SIRD is one of the three organisations, selected by the Department of Rural Development, Govt. of Gujarat to train Watershed Development Teams (WDTs). It is responsible for central and northern Gujarat. One month training sessions of WDTs as well as other programmes are conducted regularly. SIRD sends intimations to the concerned organisations.

A SIRD-based training team and additional resource persons provide the training. The training sessions are conducted in the own premises of SIRD with its own teaching materials and other aids required for training. The premises also provide for residential training.

Gujarat Agriculture University (GAU)

Based at Anand, Junagadh, Navsari and Dantiwada, GAU is a training and research institution in the field of agriculture and allied fields such as dairy, veterinary, fisheries etc. It conducts academic courses at undergraduate, masters and doctorate levels, as well as programmes on watershed development aspects, including women in agriculture etc. GAU also carries out programmes on demand, but its academic and research commitments prevent it from taking up such programmes on a large scale and on a regular basis.

6.3.3 Other training institutions

Gujarat Institute of Development Research (GIDR)

Based at Ahmedabad, GIDR works on research and training aspects related to water resources management, watershed development, wasteland development and other aspects related to rural development. It provides training in these aspects to different organisations as well as concerning research, monitoring and evaluation aspects. The latter kind of training is provided mainly on demand. The Department of Rural Development, Government of Gujarat appointed GIDR to coordinate evaluations of watershed development projects.

The institute's own training team and other resource persons provide training. The training is conducted in its own premises and with its own teaching material and other aids required for training. The premises enable GIDR to provide even residential training.

Water Resource Engineering and Management Institute (WREMI)

Based at Baroda, WREMI works on research and training aspects related to water resources management. It worked with the Rural Development Department for training of trainers on watershed development. However, this partnership lasted for one year only.

Institute of Rural Management (IRMA)

Based at Anand, IRMA works on research and training aspects related to different aspects of rural development and management. Besides having long term post graduate courses in rural management, it has special programmes for NGOs. Training on demand is also carried out. It prepares training calendars well in advance and provides training in research, monitoring and evaluation, general management aspects, gender in natural resources management etc.

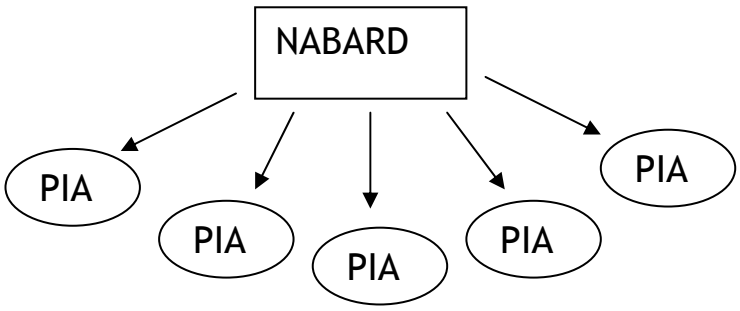
The training is provided by an IRMA-based training team and other resource persons. Institute-owned teaching material and other aids required are provided for the training sessions which are conducted in their own premises. Here, also residential training can be provided.

7 Implications for the planned IGWDP in Gujarat

7.1 Possible institutional arrangements

On the basis of the assessment of the competencies and capacities of NGOs engaged in watershed development, as well as, the assessment of the institutional framework of Gujarat, in which watershed development is embedded, a few reflections about possible institutional arrangements are made below. In doing so, the pros and cons of the particular scenario are considered.

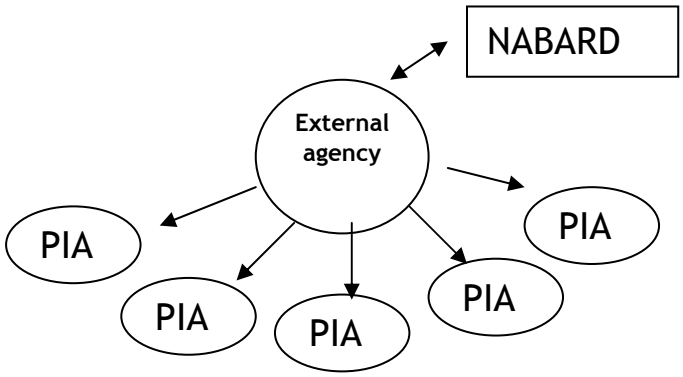
NABARD plays a central role in the institutional arrangement



In this model, the responsibilities of NABARD comprise management, coordination and, eventually, capacity building tasks. This, rather centralised, organisational structure, merely assigns the role of project implementing agencies to the NGOs. The PIAs operate the watershed projects allotted to them in an independent manner.
The advantages of such an organisational pattern are the clear lines of decision making and instruction. The costs of coordination are reduced to a minimum.

On the other hand, a large degree of expertise in various fields is demanded of NABARD. Not only are management skills, such as accountancy and coordination tasks required, but also a detailed knowledge in all fields related to watershed development. Since NABARD will be the institution selecting the PIAs, sanctioning the projects, monitoring the process, evaluating the results and, in addition, providing training at PIA level, the watershed cell has to dispose of or develop the skills which are required to fulfil all these tasks. As there are potential stakeholders which already have more expertise in at least some of the required skills, this model would imply a waste of existing knowledge and experience. Therefore, the allocation of resources would not be done in an efficient way.

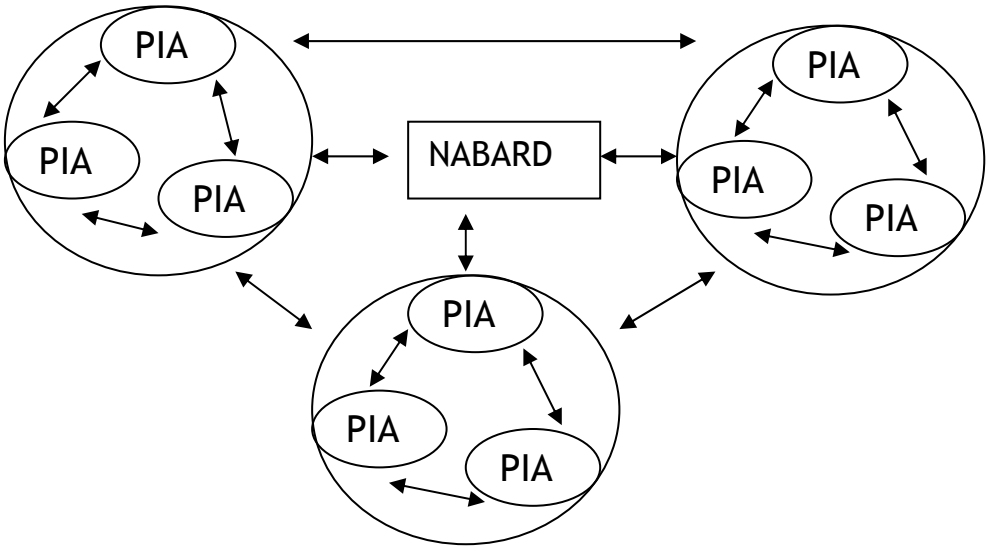
NABARD delegates part of the management and coordination functions to an external agency



NABARD delegates competencies to an external consulting and executing agency which coordinates the PIAs. These competencies could include monitoring and evaluation, selection of PIAs, identification of capacity building requirements at PIA level, and, eventually, the conduction of training measures. That intermediate agency could be an external institution, such as a research and training centre. Also, it could be an NGO which is either not involved in the implementation, or, which is at the same time involved as a PIA and takes over a leadership function. The decision making power, the financial management and the supervision function, stay with NABARD.

This model takes advantage of the specialisation of different stakeholders in different fields. The external agency would additionally have a more detailed knowledge of and a closer contact with the PIAs. In addition, this organisational structure requires less capacity building at the programme management level. The costs of coordination will be relatively low.
As the external agency in this model would hold a considerable degree of power, this could lead to a problem of control on the part of NABARD. If an NGO, which is also a PIA, takes over this role, its leadership role could provoke jealousy among the remaining PIAs.

NABARD partly delegates management and coordination functions to a network of implementing agencies



NABARD delegates competencies to a network of implementing NGOs, which take over parts of management and coordination functions. This model implies a decentralisation from state to district level. An executive body consisting of representatives of local implementing NGOs and the NABARD district officers is formed at the district level, which takes over management and coordination functions at that level. At this level, possible adaptations of implementing strategies to the local conditions of the particular district are formulated. Furthermore, members of research institutions could serve as additional consultants, or form a part of the executive bodies at both district and state levels.

To conduct these tasks, which includes monitoring as well, meetings on a regular basis are necessary. NABARD will take over the role of an umbrella institution with supervising functions at all levels, as well as management and coordination functions at the state level. For the purpose of a better performance of supervising functions of NABARD, as well as to take advantage of existing expertise in different fields of the involved stakeholders, the PIAs and NABARD will interact also with each other at the state level. Through meetings undertaken in an overall interactive network, a learning system will be established. These meetings could possibly take place in the various districts on the basis of rotation, in order to learn from the implementing strategies, which were adapted to respond to the regional, environmental and social specifics in the districts.

This institutional arrangement offers the opportunity to take a maximal advantage of local expertise and specialisation of the various actors, as the environmental and social conditions and problems vary considerably from district to district. Furthermore, implementing agencies at the district level can take advantage of particular skills and performances of the respective partner PIAs. In this way, the PIAs of the respective network could occasionally serve as providers for capacity building for one another. Possibly, the criteria of complementary skills and expertise could constitute a criteria for the selection of PIAs operating in one district. Therefore, the difficult task of an overall competence of NABARD is not required. The costs for capacity building are minimum, because this model implies an optimal usage of already existing capacities. The strengths and weaknesses of the stakeholders involved at institutional level can be balanced.

As networking is already a lively aspect of the NGO scene in Gujarat, this organisational model would not be a new form of interaction and operation for the actors. Therefore, risks and costs of such an arrangement will be kept within limits. Networking and the exchange of knowledge and support among the implementing NGOs could also have a positive effect on the motivation of the PIAs. In this more decentralised and democratic arrangement, more flexibility and effectiveness in adapting the approach to the local conditions through local experts is guaranteed. Controlling tasks would be naturally performed within the executive bodies at the district level as well as at the state level.

This model can be extended with an increase in the number of watershed development projects. In this case, the executive body at district level could help in selecting new PIAs. The final sanctioning power will remain with the regional watershed cell of NABARD.
However, as this structure is of a quite high degree of complexity, the costs of organisation and coordination will increase. Furthermore, responsibilities have to be clearly spelt out in order to avoid uncertainties about tasks which have to be fulfilled, as well as to prevent misunderstandings and abuse of authority.

The involvement of the state government appears to be important regardless of the institutional arrangement of the IGWDP presented above. As far as the selection of watersheds is concerned, it is important to embed the selected watersheds into an overall land use planning. In this, the government would be the appropriate body to take over a coordination function.

Furthermore, it is important to achieve cooperation with the Forestry Department in order to treat the entire watershed in a sustainable way (see chapter 4.2.4).
In order to obtain an optimal share of knowledge and experience, a vivid exchange with government agencies is desired at all levels of the programme.

7.2 Selection of watersheds

Selection of the region

The focus of watershed development lies in fighting the deterioration of the natural resource base. It should keep this focus under its integrated approach. In all villages studied, the problem was always related to water. Therefore, at first, the region should be selected depending on the degree of resource degradation.

Poverty concern

Within the selected region, the situation may differ from village to village as regards the natural resources and socio-economic patterns. In this case the main focus should be on poverty alleviation. However, the situation might vary not just between the villages. Even in a single village the standard of living connected to the natural resource base may vary enormously. Therefore, in Gujarat it is not reasonable to select areas for the implementation of the watershed development approach only on the basis of geographical definition of micro watershed.

Village level

In most cases, the villages consist of more than one micro watershed and the fragmentation of the settlements for integrated development is not advisable. To achieve sustainable success in development, the community as a whole has to be included. Otherwise, the already existing social incline in the societies will grow. The best example for this is Bhanpur (see chapter 5.3) village in Dahod district. It is divided into two main watersheds — one near the access road and one in the forest — and the difference between the living standards of the hamlets on both sides is enormous. In such villages it is important to see the village as a whole and to balance the activities. The support of the communication structures, would lead to the development of the identity at village level.
Consequently, it should be mandatory to take time to register the situation of a village, proposed for watershed development.

Community sense

To foster the community sense in a village, the identity at village level is a prerequisite for any sustainability in watershed development. If community sense is not well developed, then support in communication and formalising of communication structures needs to be part of the concept and must not be restricted by time or budget of a project. These kind of activities always have to be adapted to the local conditions (see chapter 7.3). But if the endeavours in this direction are not successful, the project also has to be flexible enough to withdraw or to postpone any activity in order to successfully implement watershed development.

Consequently, a project must not keep away from tackling difficulties concerning community coherence (see Laiyari village, chapter 5.2). On the other hand, it is also not advisable to push a project under all circumstances to completion without any expectation of success.

Ongoing activities

In many of the villages in Gujarat different kinds of activities are already undertaken, for example, government activities demanded by the village itself, as well as NGO activities. For the selection of a village for a watershed development programme, it is very important to see if these activities are in harmony with the watershed development approach. For example, in Kotda, the local government and the Forestry Department have been working (sometimes in competition) on resource protection but not with any socio-economic approach. In this case, it would be very important to find out if the social, as well as the technical approach of the watershed concept is compatible with these activities. It is also necessary to find out whether there are any expectations on the part of the villagers due to ongoing activities, for instance about financial contribution. On the IGWDP-guidelines sharing of the costs concerning the technical input is demanded. However, different government programmes are still free of any cost for the village. As a result, people may not be willing to contribute to watershed development.
On the other hand the combination of different programmes undertaken by different participants might also be an advantage for watershed development activities (see chapter 7.5).

Physical criteria

Usually watershed development has the *ridge to valley* approach. The practicality of this approach strongly depends on the physical conditions of the area selected. In one village in Kachchh, a highly saline geological formation was located in a proposed area for construction of a check-dam in the upper part of a watershed. If this

check-dam were to be constructed, the stored water would become saline and the salinity might increase downstream also. Thus, the area of action has to be selected very carefully. Otherwise, the success of the whole project could be endangered.

In conclusion, one might note that the careful selection of villages for the IGWDP is a very important step to its success. Trying to save time or money on the selection of watersheds and respective measures could cause higher costs and perhaps higher loss in case of a failure.

7.3 Adapting the watershed development approach to the conditions in Gujarat

In general, the biggest potential for a watershed development programme is the fact that the rural population has a strong and tight relationship with their village and their land. This is a good precondition for the successful implementation of a watershed development project. Nevertheless, to further improve the results and impact of watershed development projects, some aspects should be taken into consideration. Based on the findings of the target area analysis, as well as on the assessment of the watershed development activities undertaken in Gujarat, several suggestions can be made for the adaptation of the watershed development approach to the environmental and social conditions in Gujarat.

A comprehensive socio-economic survey of each micro-watershed

More emphasis should be laid on the PRA phase of the project to identify the environmental, economic, social and political situation and problems of the particular watershed. As seen in the villages studied during the target area analysis, these conditions as well as their interrelations vary in many aspects between the districts as well as between the villages of the same district. Conclusions from the name of a particular social group about their socio-economic situation, for instance, can not necessarily be drawn, as it may vary from village to village, as is the case with the Harijan in the villages studied. Furthermore, the role of women and their kind of participation at the economic sector can vary considerably depending on their sub group membership (see chapter 5.4.1). To respond in an adequate way to these specific conditions, the problems and needs within a watershed development project, a comprehensive study of each village is needed, even if all are situated in the same region.

A functioning communication structure as a precondition for a watershed development project

The establishment of a functioning communication structure within a watershed population seems to be of crucial importance for the successful implementation of a watershed development project. Because of scattered housing patterns within a watershed and/or occasionally sociocentric attitudes of the various social groups within a watershed (see chapter 5.4.1), there were hardly any communication channels existing. However, as they are a precondition for the successful implementation of any participatory and integrated development approach, efforts have to be made to create such structures. If village mobilisation fails and no comprehensive communication structures could be established, withdrawal of the project should be considered.

Ensuring a more balanced distribution of benefits

With regard to the large gap concerning the economic situation of families within a watershed (see chapter 5.4.1), attention should be paid to a balanced distribution of the benefits of the project. This could be reached by organising economic marginal groups into lobbies in order to place more power in asserting their interests. In addition, importance should be attached to the participation of all existing subgroups of a particular watershed during the planning phase of a project.

Exploration of possible socio-cultural constraints

Socio-cultural constraints should be taken into consideration while planning the project measures to reduce the risk of failure. The selling of surplus, for instance, may be prohibited by some cultural beliefs, even if the market is easily accessible, as it was observed in one case (see chapter 5.2.4). To counter the risk of an inadequate design of project measures, a year-long experience of a PIA in the concerned region before the start of a watershed development project could be of advantage. Besides this, local field workers who are familiar with the conditions of the concerned area could be recruited into the watershed development team.

Balancing competencies of the Watershed Development Team

It is important that the staff covers all the disciplines that are required for an integrated watershed development approach. In order to reach this aim it might be necessary to enlarge the watershed development team. Female members and social scientists should always form part of the team. In addition, new general selection criteria for PIAs should be developed and applied. The application forms should include social

skills as selection criteria. The same emphasis should be given to social skills as is given to technical skills.

Qualitative monitoring system

Up to now, only a quantitative and a financial monitoring system was applied in watershed development programmes. However, a qualitative monitoring system should be compulsory for each watershed programme. Such a qualitative monitoring system should measure, for instance, the degree and scope of participation and empowerment processes, achievements in community organisation and capacity building in different fields.

The importance of capacity building

More emphasis should be laid on capacity building at the village level, which means that capacity building should be included in all project phases and not only in the first phase of six to eight months. Furthermore, it is important to enable people, who depend on migration to earn their living, to stay in the village at the time of starting a project. Only then, can they participate in the capacity building and community organising phase within the first months of a project. As migrants generally belong to the poorer parts of the population, they would be excluded of the benefit of being recipients of training measures and being members of an organisational community unit which will be the key cell of further development activities and empowerment.

The importance of Self Help Groups

In addition, more emphasis should be given to the building up of Self Help Groups. The organisational unit of a Self Help Group is important as it serves as a body to provide linkages to other rural support programmes and as receiver of credits. Furthermore, Self Help Groups are recipients of capacity building and this is especially important for the empowerment of deprived subgroups, such as women or the landless.

The starting point activities for women Self Help Groups are usually saving activities. However, in those cases where women do not develop an interest in saving activities, they are excluded from the other benefits, such as empowerment or training measures, that they would get through being a member of an organised group. Therefore, other starting point activities like embroidery work or other handicrafts should be taken into consideration.

Establishment of a network of organised community units

Furthermore, linkages and networks among the various new institutions like Self Help Groups, watershed committees or User Groups need to be

established and strengthened in order to ensure an equal participation of all villagers in the project.

Development of common property resources and wasteland

Improvement of common property resources and wastelands should be pursued wherever possible and to the extent feasible. Apart from the technical and ecological reasons for the *ridge to valley* approach, these conserved resources could be a source of income, in particular, for the landless within a village. Distribution of user rights on these resources and introducing a commonly accepted management system for the rangeland will be beneficial for the ecological balance and supportive for the equity goal. However, one has to be aware of the danger of again overexploiting common properties when developed wastelands provide grazing opportunities for an increased number of livestock. Without combining the development of these resources with economical and socially accepted management practices the measures will probably turn out to be unsustainable.

Flexible financial budget

For a watershed project as a whole, it is necessary to have a more flexible budget depending on regional and local environmental and social conditions. In addition, the allocation of the budget for particular project components should not be fixed. This is because the implementation costs vary depending on regional specifics. In hilly or saline areas, for example, costs would be higher for technical measures. In areas with severe social problems like backwardness or social incoherence higher expenditure would be required for capacity building.

Project boundaries

The target areas for development activities should, wherever possible, comprise the entire village where a watershed is situated. Exclusive development activities in the delineated watershed area would, in many cases, severely undermine the equity goal of the programme. If a village comprises two watersheds and treatment measures would be equally beneficial in both, then both watersheds should receive treatment.

Even if only a part of a village directly benefits from measures by a watershed development project, other parts should not be excluded. It should be the village as a whole, which is promoted, for instance by formation of self-help groups, and by supporting soil and water conservation measures of farmers and by bringing alternative development activities.

Contribution fees

In accordance with regional income variations, the contribution fees of the farmers should be coupled with the regional income average. Furthermore, the contribution fees for measures on private land should be graduated depending on the financial situation of a particular person. It has been observed by some NGOs that richer farmers had to pay up to 50 percent contribution for measures on their private land. The contribution fees according to the government guidelines are at present between 5 and 10 percent. The contribution fees of the IGWDP-guidelines are at 16 percent.

Extension of the contacts of the villagers as a part of empowerment

To extend the contacts and information of the rural population to spheres which go beyond the respective village borders, about 10 to 15 villages within the watersheds could be united to a watershed union. Through this an exchange of knowledge and experiences in all fields can be facilitated. This approach has already been successfully realised by some NGOs in Gujarat. In the case of JFM, a State Level Federation of Peoples Institutions has been established. Its objectives are to strengthen the village institutions, as well as to influence the state administration in the formulation and implementation of policies related to JFM.

The promotion of the watershed development idea among the villagers

In order to create awareness for resource conservation measures in surrounding villages where no watershed development activity has been undertaken so far, people of the village with watershed activities could be encouraged to sensitise the population of the neighbouring villages.

7.4 A facilitating policy environment

Abolishing subsidies for groundwater extractions

The practice of providing heavily subsidised inputs for groundwater extraction should be reviewed and probably abolished completely. There are numerous ways how different measures, aiming at supporting agricultural production in Gujarat, drain valuable financial resources and aggravate the environmental problems already persistent in many districts.

The Government spends hundreds of millions of rupees each year to provide electricity to the agricultural sector at prices far below production costs. In the light of budgetary constraints and electricity production and availability problems, there is mounting pressure from economists and also from foreign donors to use this money in a more

reasonable manner. Power consumed by the farm sector went up to 46 percent of the total production. While per unit cost of power production is Rs 3.20, the Gujarat Electricity Board (GEB) supplies this power to the farmers at a rate of Rs 0.2. Per day additional burden on the GEB as a result of the subsidised power supplied to the farm sector is calculated at Rs 6 crores (1.3Million USD). GEB operates at present with losses of more than Rs 3,200 crores (710Million USD) per year[33], most of which can be attributed to the Government determined pricing policies.

The same applies to subsidised credit for diesel or electric water pumps. The presence and operation of such deep ground water extraction devices is a major obstacle to water conservation attempts.

In-situ water conservation efforts through watershed development are a mockery as long as groundwater extraction outstrips recharging, possibly by many times. Experiences at the village level show that sustainable improvement of local water availability is only possible and closely linked to stopping operations of deep bore wells. However, at the moment all these efforts depend on arrangements agreed upon at the village level. There is no short-term (financial) reason or incentive to stop pumping of groundwater.

Water pricing

Charging appropriate rates for water consumption, either for irrigation or household purposes, should be introduced at least in those places where functioning supply systems are installed. Although this would mean a complete shift away from the subsidy paradigm to a model of efficient resource allocation, there is no long-term alternative to putting a price on the State's most scarce and precious natural resource.

Evidence from other states and from other countries suggests that the general interest in improved service levels is accompanied by the willingness to pay for it (UNDP-WORLD BANK WATER AND SANITATION PROGRAM - SOUTH ASIA, 1999). Where functioning supply systems are in place, people will be able to and be willing to pay. A financially sustainable supply system must aim at least at cost recovery in any case.

33 Articles in the 'Times of India', dated September 22 and 24, 2000, indicated that actual costs of this subsidising policy might even be much higher, i.e. due to the currently increasing electricity demand in agriculture because of the drought situation. Further harm is in fact done by the practice of cutting supplies to urban industries in favour of supplies to rural areas. Overall economic costs can be expected to be tremendous.

At farm level, it is difficult to understand why small farmers and other marginalised communities have to pay the price for decreasing ground water levels. While large farms use ground water at almost no cost[34], the drying up of wells causes additional burden for other households in the same area. There is no system, which provides at least for balancing of costs and benefits between the water users in the same geographical area.

There is the need for further research into technically feasible and socially and culturally acceptable approaches to introduce tariff systems. However, there are easy to introduce mechanisms to start with charging at least for consumption of ground water[35]. There is a willingness to pay but at the same time there is considerable –probably politically coloured– unwillingness to charge.

A state-wide watershed development plan

At least an overall watershed development strategy should be incorporated into a state-wide land-use planning system. There is the need to apply a system of comprehensive and long-term area planning, in particular in the field of water resources, in order to avoid undesired developments and negative impact.

Till date there is little coordination between the individual watershed development projects. Planning at the micro-level is not embedded in an overall strategy and does not take into consideration the interactions between upstream and downstream watershed development measures and impacts. This might cause serious problems. While check dams, for instance, may be instrumental in helping some villages to solve their water problems, this micro-level solution can create water scarcity problems in downstream cities[36].

In the course of planning, all possible impact on other watersheds should be taken into consideration. At the micro-level, the optimum location of structures can only be identified if all neighbouring watersheds are also considered. This is only possible within a system of integrated land use planning for watershed development.

34 Water charges for irrigation are on a per hectare basis. The average charge is Rs162 per hectare and season (Times Of India, September 27, 2000)

35 The Government of Gujarat is currently discussing a steep hike in irrigation water charges by 250 percent (Times Of India, September 27, 2000). At the same time, the system is intended to shift from per hectare charges to volume charges. However, implementation of higher tariffs is postponed due to the current drought situation. It remains doubtful how serious this shift in water pricing will be pursued and, whether, at least in the medium-term cost coverage could be achieved.

36 There are examples of such development in the Rajkot area cited in the 'Times of India', September 14, 2000.

In the long-term, such land use planning should also take into consideration regional infrastructure development, the location of natural reserves, rural industries, etc. At the moment, efforts in this direction are, at best, made locally and depend on the knowledge and interest of the concerned implementing agencies.

Embedding watershed development planning in an overall land use policy for rural areas could certainly enhance the positive sustainable impact of the approach. Hence, joint development efforts in a larger watershed area could make better use of synergetic effects within a larger treated area.

7.5 Alternative watershed development strategies

The watershed development projects, which the study team visited, varied a lot in their degree of comprehensively applying an integrated approach. It depended on the area and actual requirements and, more important, on the approach taken by the PIA. The latter observation is explained in detail in chapter 4.3.3. The (Government) guidelines demand for an approach, which takes into consideration all groups present in a village and calls for comprehensive participation in planning and implementation. However, it must be noted that a village is hardly congruent with a watershed. Even with the existing possibility of splitting a village into several watersheds and treating them simultaneously, in practice, watershed development activities take place only in parts of the villages.

The idea for collaboration with complementary programmes is stressed, while again, the presence of corresponding programmes in watersheds that were already treated depend more on the implementing agency and their knowledge about such possibilities than on the actual requirements at the village level. The budgetary provisions made for parallel activities is limited and will at best act as start-up finance for a limited number of pilot activities.

Project implementing agencies might also be overburdened with activities that lie outside their main field of expertise. Implementing and monitoring a multiple-objective project is difficult while drawing only on the staff allocation, which is envisaged in the guidelines. Natural resource management (NRM) projects do have other requirements concerning staff than comprehensive IRDPs. To pursue an integrated approach there is a need for involving expertise from a very broad range of professional backgrounds.

Based on the field observations and evaluation of literature from and about different projects, there are basically three different strategies that could be pursued for successful and sustainable implementation of watershed projects under the Indo-German Watershed Development Programme[37].

Watershed development as a natural resource management project

Limiting activities under the IGWDP to soil and water conservation measures would cut back on the broader objective concerning poverty orientation. However, the impact of improving natural resources in a watershed would nevertheless also be positive for the poorer strata of the village population. Even in a purely technically oriented NRM project trickle-down effects will enable broader participation in the benefits. But without touching on issues like equal distribution of economic improvements or advancements, the actual gap between rich and poor, more precisely, between landowners and landless, will probably widen.

The advantage of a purely technical NRM project would be that it concentrates on addressing soil and water problems, which are acute in many places. The approach would not dilute its efforts by trying to solve the multiple problems at the village level. From the limited budget though, a larger number of villages could benefit, albeit, with a limited equity scope. Nevertheless, the long term success here could only be secured by also investing in awareness raising and community mobilisation, in particular, as far as maintenance is concerned.

Watershed development as an integrated rural development approach

Implementing watershed development projects in a way as to cover comprehensively all the socio-economic problems within a village would be very demanding in terms of financial resources required and PIA capacity needed. Participative planning of integrated rural development demands a range of skills, which would probably not be available in one single PIA. In addition, all planning issues would have to be embedded into a regional economic development plan. This is actually a government task and could hardly be expected from an NGO.

Although such approaches are pursued by some agencies and donors under the name of Rural Livelihood Support, for instance, such projects seem hardly feasible to implement on a broader regional scale and by a single financing agency. There is no doubt about the benefits that can

37 An interesting study on assessing the poverty reduction perspective of different European-aided watershed development was conducted by CDR (CDR, 1998). Part of its research was also to assess objectives and strategies of different projects.

be created for a village as a whole. Designing small 'sub-projects', addressing the needs of specific sub-groups can help to narrow wealth gaps. Individual needs can be taken into account and embedded in an overall development strategy.

However, to put all the planning, financing and management burden on a single programme and/or having a single NGO implementing the project might be possible on a case to case basis but would be over-demanding in a broader regional context.

Watershed development as a natural resources focused project with a pilot character for other village level based development activities

Using a watershed development project as a starting point for other development efforts in a village provides most likely the most suitable and sustainable development alternative. The attempt should consist in combining synergetic programmes without putting overall responsibility for different components on one single project or one single institution.

Provided that the necessary budgetary allocations are made, village mobilisation and formation of self help groups for soil and water conservation measures could also form the starting point for other development activities outside the field of natural resource management. Institutions formed during the capacity building phase — or later— could serve as contact points for other programmes. PIAs would still be responsible for the mobilisation of village population. Additionally, they should identify other accessible development programmes, suitable for mitigating or solving existing socio-economic problems at village level. This approach is already successfully practised by a number of the NGOs in Gujarat (see 4.3.3).

Another possibility could be approaching the village with an entry point activity, which addresses an acute problem, possibly outside the scope of soil and water conservation measures. A small pilot project, e.g. building of a small health post, could be handed over to the respective authority that could then further support this development effort, e.g. through the provision of teachers.
How far the support of PIAs for such activities could go depends partly on their experience in fields other than soil and water conservation measures. Partly, it is also a question of project budgets and the willingness of other programmes to cooperate. There is certainly a need for mutual information exchange between actors in different development programmes. Knowledge about accessibility and functioning of the various programmes (see 4.2.5) should be spread at least amongst all NGOs working in rural development. Until the year

2000, funds for these programmes remain partly untapped, presumably due to a lack of suitable proposals. PIAs for watershed development under the IGWDP should be made aware of these programmes.

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Annexes

Annex 3: Comprehensive description of the 15 Non-Governmental Organisations studied

- Action for Social Advancement (ASA)
- Aga Khan Rural Support Programme (India)
- ANaRDe Foundation
- Development Support Centre (DSC)
- Gramin Vikas Trust (GVT)
- Gujarat Rural Institute for Socio-Economic Reconstruction (GRISERV)
- International Rural Educational and Cultural Association (INRECA)
- Manav Kalyan Trust (MKT)
- Medhavi
- N M Sadguru Water and Development Foundation (Sadguru)
- Prakriti Foundation for Natural Resources Regeneration
- Shree Vivekanand Research and Training Institute (VRTI)
- Social Action for Rural and Tribal In-Habitants of India (SARTHI)
- Utthan
- VIKAS Centre for Development

Action for Social Advancement (ASA)
founded in 1995

Headquarter: 2nd floor, Utkarsh Apartment
Sahayog Nagar
Dahod 389151
Phone and Fax: (02673) 21546/30484

Objectives: Empowerment of community based organisations through intensive capacity building interventions with special focus on the role of women and the socio-economicly deprived groups.

Fields of activities:
- watershed development
- micro credit and income generation
- action research (testing and promoting appropriate agricultual technologies and practices)
- skill enhancement at target group level
- consultancy services for other NGOs and GOs

Regional coverage: Dahod, but mainly in the state of Madhya Pradesh

Field Offices: 3 field offices in Madhya Pradesh

Staff: Total number of professional staff: 24; in addition: 30 staff members from local villages

Experience in watershed development: Since its foundation in 1995, ASA has implemented 36 watershed development projects. All of them are located in Madhya Pradesh.

Capacity building for other NGOs: ASA provides consultancy services to other NGOs and GOs in the form of training, undertaking studies, etc.

Networking: -

Overall characteristics and specifics:
ASA was founded by a group of 5 professionals with an interdisciplinary background and grassroot level experience in the field of natural resource management in the western tribal area of Gujarat.

ASA considers community organisation and capacity building at village level as a very important factor for the success of a watershed development project. The duration of the capacity building phase of projects implemented by ASA varies between 1 and 1.5 years.

In addition, ASA puts much emphasis on aspects of participation and sustainability. It developed several implementation strategies and modifications of the watershed development approach to increase the positive outcomes of a project. To enhance the degree of participation within a project and to balance political power in a watershed, ASA strives to organise the entire watershed population in Self Help Groups, which will then be the key cells of development activities (see chapter 4.3.3). To improve the self-responsibility of the target group for the maintenance of physical structures, ASA increased and graduated the contribution fees for measures on private land. It also introduced the arrangement that a share of the contribution fee has to be paid in cash. Concerning structures on common land, farmers have to negotiate about the amount of contribution fee of each user to create more transparency, self-responsibility and common sense among the users.
ASA has a comprehensive monitoring system which covers both, quantitative and a qualitative aspects.

Aga Khan Rural Support Programme (India)
AKRSP(I)
founded in 1983

Headquarter: Choice Premises, Swastik Cross Road
Navrangpura
Ahmedabad 380 009
Ph: (079) 6427729
Fax: (079) 6420864
e-mail: AKRSP(I)i@icenet.net

Objectives: AKRSP(I) aims at empowering rural communities and groups, particularly the underprivileged and women, to take control over their own lives and to manage their environment. Additionally, the objective of AKRSP(I) is to increase the rural income by giving villagers access to knowledge and material inputs. AKRSP(I) promotes cost effective and environmentally sound ways to improve yields from land, water and forest resources.

Fields of activities:
- natural resources development and management (water resource development, soil and water conservation, forestry, bio-gas, agriculture)
- human resource development (community organisation and mobilisation, gender and development)

Regional coverage: Bharouch, Surendranagar and Junagadh; 450 villages have been covered until 2000.

Field Offices: Netrang (Bharouch), Sayla (Surendranagar), Gadu (Junagadh); several cluster offices in the respective districts

Staff: Total: 150 (21 female, 129 male)

Experience in watershed development: From 1995 until the year 2000 AKRSP(I) has implemented 37 watershed development projects; 30 staff members have been trained in the watershed development approach so far.

Capacity building for other NGOs: Since 1990, AKRSP(I) has provided participatory training to other NGOs and government organisations in the fields of participatory rural appraisal, gender and participatory irrigation management; 15 trainers are at the disposal of AKRSP(I).

Networking: AKRSP(I) is member of different non-governmental and governmental networks in the field of irrigation, watershed development, salinity, forest and women empowerment.

Overall characteristics and specifics:
The work of AKRSP(I) is based on the formation of different kinds of village institutions in order to provide communities with the structure they need to manage their own development. For this purpose, different groups, such as Gram Vikas Mandals, Mahila Vikas Mandals, Self Help Groups and User Groups, are formed. Since 1999 AKRSP(I) has applied a systematic approach to identify women's resource needs and means for their empowerment. The aim is to involve women in all project components.

The watershed development projects of AKRSP(I) always include income generating measures and focus on the establishment of linkages to other governmental programmes and banks. Further on, poorer

sections of the village population have to pay lower contributions. In this way, AKRSP wants to assure more equity.
The organisation applies the strategy of creating federations of 10 to 15 watershed villages in order to improve their communication and the exchange of knowledge.

In order to have a closer contact with the target group, AKRSP(I) works with extension volunteers. Their task is to act as a bridge between the rural communities and AKRSP(I). They are supposed to familiarise villagers with project objectives, to motivate them to participate in the project activities, to supervise the project implementation, and to undertake monitoring. AKRSP(I) actively encourages women to undertake this task.

Ongoing research and monitoring activities are the basis for flexibility in adapting the work to different environmental, social and economic circumstances. The organisation considers itself as a learning organisation, which strives for a continuos improvement of future efforts by learning from the lessons of the past.

AKRSP(I) has shown very good performance in the field of natural resource development and management, as well as agriculture development. This good performance is based on extensive experience, sound knowledge about the physical environment of the project region and on a large number of technically qualified staff. There are at least three technicians working in a watershed development team.

The performance of AKRSP(I) could still be improved in the fields of pasture development and animal husbandry. Less efforts are made in awareness raising, using indigenous knowledge and the involvement of women in natural resource management.

ANaRDe Foundation (North-Central Gujarat) [1]
founded in 1979

Headoffice: Shreeji Krupa Building
Ambawadi
Himatnagar 383 001
Distr. Sabarkantha
Phone and Fax: (02772) 40709

[1] ANaRDe Foundation is acting in various states of India. Three autonomous branches exist in North-Central Gujarat, South Gujarat and Saurashtra and Kachchh regions. The following data relates to the North-Central branch of ANaRDe.

Objectives: AnaRDe strives for enhancing the quality of life of rural people, especially of small/marginal farmers, the landless and women, through economic uplifting and community organisation. By means of effective participation, and by promoting a sense of self-help, the rural population shall be made self-reliant and self-sufficient.

Fields of activities:
- economic development programmes (60%)
- health programmes (10%)
- educational programmes (10%)
- environmental programmes (10%)
- social development programmes (10%)

Regional coverage: Sabarkantha, Banaskantha, Ahmadabad, Mehsana/Patan, Panchmahal/Dahod, Godhra, Anand, Gandhinagar and Kheda

Field offices: -

Staff: Total: 60 (7 female, 53 male)

Experience in watershed development: Since 1995; 52 watersheds implemented in four districts until 2000; 20 persons trained in watershed approach so far

Capacity building for other NGOs: About 3 years ago, ANaRDe started to provide training measures for smaller NGOs in North-Central Gujarat, mainly in the fields of credit and SHGs.

Networking: ANaRDe maintains informal contacts with other NGOs but is not a member of a formal NGO networking body.

Overall characteristics and specifics:
The organisational structure of ANaRDe is characterised by a high degree of decentralisation. As far as possible, decision-making is done autonomously at each organisational level in order to take advantage of local expertise.

As the objectives of ANaRDe are the self-reliant economic upliftment of rural poor and marginal groups, their main activities lie in the fields of credit and Self Help Groups. In the North-Central region more than 3,000 SHGs have been created so far. For many of them linkages to

banks have been established. Their focus on poverty alleviation and women is demonstrated by specific empowerment strategies such as the calculated membership to the watershed committee of a WDP.

ANaRDe considers itself as an organisation, which works at the grassroots level. It is rarely engaged in research and policy making activities. A large share of the staff consists of locally based social workers to assure a close contact and relation to the target group. ANaRDe considers its main task as a PIA being a facilitator of self-help processes. In this role, AnaRDe, for instance, encouraged a village watershed committee to take over the role of a PIA for a watershed development project in a neighbouring village.

ANaRDe sees its strengths in social aspects such as contact with and knowledge about the target group, community organisation and mobilisation, conflict resolution, realisation of participatory approaches as well as soil and water conservation measures, afforestation and credit issues. It has more than twenty years of experience in rural development. Room for improvement can be identified in the fields of animal husbandry, pasture development and agricultural development. ANaRDe is aware of the existing lack of technicians among its personnel.

Development Support Centre (DSC)
founded in 1994

Headquarter: 2, Prakruti Apartment
Opp. Red Rose Restaurant
Ff S.V. Desai Road, Navrangpura
Ahmedabad 380 009
Ph: (079) 6301892
Fax (079) 6303296
e-mail: dsc@satyam.net.in

Objectives: DSC was established to provide support to people centered organisations, programmes and policies in natural resource development with an emphasis on participation, equity, efficiency, cost-effectiveness, sustainability, honesty and transparency.

Fields of activities: DSC provides support and services to NGOs, government agencies, village level organisations and other institutions working in the field of natural resource development. Their services and support mainly relate to Watershed Development, Participatory Irrigation Management and Joint Forest Management Programmes. They include the following aspects:

- Training on Watershed Development and Participatory Irrigation Management Programmes for NGOs, government and village level functionaries.
- One-to-one support for non-governmental and governmental partners in natural resource management programmes.
- Production of video, audio and print material for distribution to NGOs, government and other institutions.
- Support of the Rural Development Comissionerate and the District Rural Development Agencies (DRDA) in developing more innovative forms for appraisal and monitoring of watershed works.
- Influencing policies related to natural resource management through interaction with key players at various levels.
- Implementation of own natural resource management based projects.
- Research on developmental issues.

Regional coverage: DSC operates in most districts in Gujarat through support services and implementation of Watershed Development, Participatory Irrigation Management and Joint Forest Management Programmes. The watershed development projects of DSC are implemented in Amreli and Sabarkantha districts.

Field Offices: Amreli, Sabarkantha, Mehsana and Banaskantha.

Staff: Total number of staff: 34 (4 female, 30 male)

Experience in watershed development: Until October 2000, DSC has completed 5 watershed development projects and has been involved in the implementation of 14 projects. Most of the staff at DSC has been trained in the watershed approach.

Capacity building for other NGOs: The Centre for Participatory Learning is the unit of DSC dedicated to training and support services for the watershed development programme. Training programmes are designed for GO, NGO and village functionaries in watershed management and participatory irrigation management. Training courses

include essential elements of participatory planning, implementation, and technical requirements of natural resource management (NRM). DSC applies particular training methods, such as group discussions, role playing and study-cum-exposure visits. The participants´ feedback ensure on-going improvements of the design of the training courses. The course duration ranges from a few days to a full month. Between 1994 and 1999, 98 programmes were organised.

Networking: The sharing of and learning from experiences within the organisation and outside is integral part of the DSC system. Therefore, DSC is in regular contact with most of the NGOs and governmental organisations in Gujarat. At the government level, DSC is a member of various committees working on the issues of watershed development and participatory irrigation management. Besides this, DSC is a founding member of the SAJATA network (see chapter 4.3.2).

Overall characteristics and specifics:
Being a pioneer organisation in policy influencing on watershed development and participatory irrigation management programmes, DSC has a very good linkage to the government departments. It always plays a proactive role in procedural or policy level changes at the state or national levels. Until the year 2000, it influenced 55 procedural/policies at the national and state levels in order to create a more enabling environment for participatory natural resource management programmes.

To turn these policy changes into reality, DSC brings NGOs and GOs together in workshops and training programmes on focused themes.

DSC is one of the six Training and Support Voluntary Organisations (TSVO) in India selected by CAPART to conduct training for organisations implementing their watershed development programme. In the year 2000, the Commissionerate of Rural Development in Gujarat has selected DSC to conduct training for organisations implementing the Watershed Development Programme of the Ministry of Rural Areas and Employment. The State Institute of Rural Development (SIRD) has also approached DSC to conduct village level training programmes.

DSC was involved in developing the guidelines for the Watershed Development Programme of the Ministry of Rural Areas and Employment.

With regard to its implementation skills, DSC sees its strengths in its participatory approach, in its ability to establish village institutions and to address gender issues and in its strategy to blend technical inputs with indigenous knowledge. It sees further room for improvement in the fields of agriculture, animal husbandry, micro finance and computer usage in NRM.

Gramin Vikas Trust[2]

State Office in Dahod: Kanchan Kunj
Anand Bhawan Compound
Near Post Basic High School
Chakaliya Road
Dahod 389 151
Ph: (02673) 30984/21311
Fax: (02673) 30392

Objectives: The participative, poverty and gender focused approach of Gramin Vikas Trust aims at the improvement of livelihoods of poor rural people. It focuses on the development of sustainable farming systems and an increased farming systems production. In order to sustain the process of participatory agricultural development, village based institutions are established and the rural population is enabled to use links with government and other institutions.

Fields of activities: Gramin Vikas Trust (GVT) undertakes activities in the fields of agriculture, animal husbandry, natural resource

[2] Since 1999, Gramin Vikas Trust promoted by Krishak Bharti Cooperative Limited (KRIBHCO), has been, implementing phase II of the Western India Rainfed Farming Project with technical and financial help from the Department of International Development (DFID), U.K. and the Government of India. Phase I of the project started in 1993. The Western India Rainfed Farming Project covers two districts in Gujarat, two in Rajastan and three in Madhya Pradesh. The Project Office is located at Udaipur (Rajastan).

development and management, Joint Forest Management, procurement of technologies, saving and credit, enterprise promotion, health, education and migrant support.

Regional coverage: In Gujarat, GVT is working in the Panch Mahals and Dahod districts.

Staff: Total number of staff involved in the Western India Rainfed Farming Project: 136 (15 female, 121 male)

Experience in watershed development: Watershed activities of GVT are mainly linked to the Western India Rainfed Farming Project. In Gujarat and Madhya Pradesh, GVT has also implemented watershed projects under the National Watershed Guidelines. It has undertaken special research projects in the field of watershed development with the Indian Council of Agricultural Research (ICAR) and related research centres.

Capacity building for other NGOs: GVT provides consultancy, training and technical advice to smaller NGOs and GOs.

Networking: GVT collaborates with a number of agriculture research and rural development institutes mainly in the fields of generation and improvement of technologies for crop improvement and natural resource management.

Overall characteristics and specifics:
The Western India Rainfed Farming Project implemented by GVT aims at the improvement of livelihood of the rural poor. 86 percent of its funds are provided by DFID, 4 percent by KRIBHCO, 5 percent by the village communities and 5 percent by State and Central Government. Watershed development efforts, such as soil and water conservation measures, are embedded in this integrated project. As a consequence, GVT does not depend on governmental funds for the implementation of watershed development measures and can follow its own approach in a more flexible way.

It is part of the approach of GVT to focus on local institutions and Self Help Groups. SHGs are generally headed by local para-professionals (*Jankars*). They are female and male members of the communities which are selected by the community in order to facilitate both planning and monitoring sessions. GVT has developed its own participatory planning approach in order to analyse complex and

interrelated problems of farming systems development. In order to focus only on poor villages, GVT has elaborated precise village selection criteria which take into consideration a number of different aspects concerning poverty.

GVT employs qualified staff, which cover all disciplines necessary for the implementation of an integrated programme.

GVT considers its strengths in the fields of participatory approaches, soil and water conservation measures, group formation as well as in its monitoring system. It has a close contact with the target group as well as a very good knowledge about the social and physical conditions in their project region. Project components such as afforestation, pasture development and animal husbandry as well as the ability of GVT to work with conflict resolution strategies could still be improved.

Gujarat Rural Institute for Socio-Economic Reconstruction (GRISERV)[3] since 1986 in Gujarat

Headquarter: 3rd floor, Indra Complex
Manjalpur
Baroda 390 004
Phone and Fax: (0265) 651802
e-mail: BAIF.GRISERV@BPNL.COM

Objectives: The upliftment of rural poor through self employment and sustainable development, using available natural resources and appropriate science and technology.

Fields of activities:
- cattle development programme
- watershed development programme
- agro-forestry/horticulture development programme
- women empowerment programme
- village health and hygiene
- training in development related fields

Regional coverage: GRISERV operates in about 3,000 villages in the districts of Baroda, Ahmedabad, Panch Mahal, Dahod, Bharouch,

[3] GRISERV is the Gujarat branch office of the BAIF organisation, which operates all over India with approximately 1,700 employees. BAIF was founded in 1967 in Maharashtra. Its first activity was in the field of cattle breeding.

Nandod, Surat, Valsad, Navsari, Bhavnagar, Junagadh, Amreli, Kachchh, Rajkot and Mehsana.

Field Offices: In addition to the head office at Baroda, GRISERV runs 4 regional offices and 3 demonstration farms.

Staff: total number: 240 (4 female; 236 male)

Experience in watershed development: Until March 2000 GRISERV has run a total number of 131 watershed development projects in 8 districts (Panch Mahals, Ahmedabad, Bharouch, Valsad, Bhavnagar, Amreli, Junagadh, Rajkot). About 60 employees have worked in watershed development. An equal number are already trained to take over watershed development tasks.

Capacity building for other NGOs: Since 1986, GRISERV has been providing training facilities for other NGOs in the fields of animal husbandry, fodder production, agriculture/horticulture and women and child care. Since 1995, GRISERV has been conducting training in watershed development. The training centres are located in Baroda, Ahmedabad and Bharouch.

Networking: GRISERV is in contact with other NGOs and is engaged in network systems.

Overall characteristics and specifics:
GRISERV is one of the largest NGOs in Gujarat and operates on a wide regional scale. It has a rich experience in watershed development and a good theoretical overview about issues and policies related to watershed development. Furthermore, it is engaged in agriculture research activities, and provides training. It has off-farm training facilities in 3 districts.

As far as the staff is concerned, GRISERV considers an academic qualification as an important factor. It has a bias in technical and agricultural related fields. The number of employees with a professional background in social sciences is, however, very low. The same is the case relating to the number of female staff members.

GRISERV has a very good track record in technical fields and in the fields of agriculture and animal husbandry. Room for improvement can be identified in the fields of community organisation and mobilisation,

the formation of SHGs, monitoring and evaluation, credit, as well as pasture development.

International Rural Educational and Cultural Association (INRECA)[4]
founded in 1984

Headquarter: INRECA Complex
Rajpipla Road
Dediapada 393040
Distr. Narmada
Ph: (02649) 32024
Fax: (02649) 34592

Objectives: INRECA aims at helping the poor and under privileged sections of rural societies by improving the standard of living and through a sustainable development of natural resources.

Fields of activities: Rural and urban development with special focus on education, health, nutrition, water resources, conservation, sustainable agriculture and animal husbandry, harnessing and developing renewable energy resources and technologies, cottage industries, food processing and preservation, housing, forestry and fishery.

Regional coverage: INRECA is working in about 50 villages in the districts of Bharouch and Narmada.

Field Offices: -

Staff: Total number: 60 (25 female; 35 male)

Experience in watershed development: INRECA has been involved in the implementation of 12 watershed development projects so far. The projects were run since 1995 in the districts of Bharouch and Narmada. 9 staff members are involved in watershed development.

Capacity building for other NGOs: -

[4] INRECA has its head office in New Delhi

Networking: INRECA is not involved in networking activities with other NGOs.

Overall characteristics and specifics:
Apart form the permanent staff of 60 employees, INRECA has about 90 volunteers who are mainly engaged as field workers.

INRECA considers its skills in the fields of indigenous knowledge and the intensity of contact with the target group as very good. The organisation sees possibilities for further improvement in the fields of agricultural and pastoral development, capacity building at village level, as well as in their monitoring system.

Manav Kalyan Trust
founded in 1984

Headquarter: Bhaktinagar, At and Post Khedbrahma
Khedbrahma 383 255
Distr. Sabarkantha
Ph: (02775) 20085

Objectives: Manav Kalyan Trust (MKT) focuses on group based interventions in order to ensure an integrated, balanced and equitable development of human and natural resources irrespective of geographical, cultural and economic diversity. It strives for supportive development policies and aims at improving the socio-economic conditions of the rural population. The principles of MKT are democracy, gender equity and self-reliance.

Fields of activities: Besides its empowerment activities, such as struggle against exploitation and injustice faced by the tribal population, MKT undertakes various developmental activities in the fields of natural resource development and management, agriculture, joint forest management, food security and bio-diversity, education, health, income generation, and saving and credit.

Regional coverage: Sabarkantha, Banaskantha, Kachchh, Mehsana, and Gandhinagar.

Field Offices: One coordinating office at Gandhinagar, 3 training centres.

Staff: Total number of permanent professional staff: 76 (34 female, 42 male)

Experience in watershed development: Since 1995; until the year 2000, MKT has been involved in the implementation of 21 watershed development projects.

Capacity building for other NGOs: -

Networking: In order to share knowledge and expertise with other organisations and to advocate particular issues at an appropriate level, MKT has developed contacts with a number of national and international agencies.

Overall characteristics and specifics:
The activities of MKT are based on the principles of rural development as conveyed by Mahatma Gandhi. Following Gandhi's philosophy, MKT focuses on social action on the one hand and on constructive work on the other. In its initial stage, MKT was exclusively devoted to the eradication of oppression, exploitation and injustice towards the tribal and underprivileged groups of the rural population. In line with its advocacy function, MKT was involved in various disputes with the government. In this way, MKT achieved, for instance, the reclamation of traditional cultivation rights for tribals in the catchment area of the Dharoi river. MKT stopped the construction of Hathipagla dam and proposed a suitable and sustainable alternative, which was finally realised without relocating the seven villages threatened by the planned construction of the dam. MKT developed special methodologies, such as role playing or particular participatory approaches, to address the tribal population.

MKT is very sensitive on gender issues. The NGO provides special training programmes for women, especially in the field of awareness building. In order to ensure women's rights under the Panchayat Raj Act, MKT is, for instance, providing training programmes to elected women leaders of Panchayat Raj Institutions. In this way, they can develop skills and knowledge in order to carry the responsibility of the administration and to participate effectively in rural development.
It is part of the approach of MKT to work with village volunteers and community leaders who are the promoters of the philosophy of the organisation.

As the degradation of natural resources has a direct bearing on the rural population, especially on the tribal communities, natural resource development has always been one of its concerns. In some of its JFM and watershed development projects, MKT focuses exclusively on fostering the participation of women.

MKT considers its close contact with the target group as its major strengths. Because of its long presence in the project area, the NGO has built up a relationship of trust with the target group.

Medhavi founded in 1993

Headquarter: Shreeji House, behind M.J. Library
Ashram Road
Ahmedabad 380 006
Ph: (079) 6578594/6575762
e-mail: medhavi@icenet.net

Objectives: Medhavi aims for an integrated development of rural and urban areas, to achieve in-built system of positive change and sustained growth by utilising the principles of self-development, unity, participation and self-reliance along with optimum utilisation of available resources.

Fields of activities: In rural areas, Medhavi is involved in undertaking watershed and wasteland development projects, in drinking water supply, sanitation and health programmes and in the field of micro-credit.

Regional coverage: Medhavi operates in all districts of Gujarat and in the Pali district in Rajasthan. The NGO covers 106 villages and 143 municipalities of Gujarat.

Field Offices: 10 field offices

Staff: Total 151 (101 female, 50 male)

Experience in watershed development: Experience since 1995; until the year 2000, Medhavi has been involved in 105 watershed projects. 27 staff members are trained in the watershed development approach.

Capacity building for other NGOs: -

Networking: Medhavi is integrated in a network which focuses on gender issues.

Overall characteristics and specifics:
The rapid development of Medhavi has to be pointed out. The NGO, which was founded in 1993, is already involved in more than 100 watershed development projects and covers all 25 districts of Gujarat. Medhavi preferentially recruits young professionals with less than 5 years experience, in order to better incorporate them to the specific goals and objectives of the NGO. Apart from the 151 employees working on a permanent basis, Medhavi has a large number of part time employees at its disposal which are employed on project basis.

Medhavi considers its experience in watershed development, especially in the field of water conservation, as one of its major strengths. On the other hand, it still sees room for improvement in the fields of health and sanitation, education, micro credit and community mobilisation/organisation and participation.

Although the NGO has quite a good knowledge about the target group and its specific situation, the relationship of Medhavi to the target group could still be intensified. The NGO has a good theoretical knowledge of the guidelines and its principles and reflects on them in a critical way.
Medhavi does not yet have its own monitoring system.

N M Sadguru Water and Development Foundation
founded in 1974

Headquarter: Post Box No. 71
Dahod 389151
Ph: (02673) 22030/31350/40215
Fax: (02673) 30749
e-mail: nmsadguru@yahoo.com

Objectives: Sadguru strives to improve the social and environmental living conditions of rural and tribal people, mainly by developing and expanding environmentally, technically and socially sound natural resource interventions in order to ensure equitable and sustainable development.

Fields of activities: The programme activities of Sadguru include water resources development through community managed lift irrigation and water harvesting structures, micro watershed development, community forestry, joint forest management, horticulture development, agriculture extension, women milk-producer cooperatives, micro credit activities, rural energy as well as off-farm income generating activities.

Regional coverage: Sadguru is working in the districts of Dahod and Panch Mahals (Gujarat) as well as in one district of Madhya Pradesh and in two districts of Rajasthan. Until 2000, more than 375 villages have been reached by activities of Sadguru.

Field Offices: Sadguru has three field offices in Dahod, Chosala and Jhalod.

Staff: Total: 82 (24 female, 58 male)

Experience in watershed development: Sadguru has rich experience in watershed development. Until the year 2000, Sadguru has been involved in 36 government funded watershed development projects. Before their involvement in government funded programmes in 1995, Sadguru already followed the watershed development approach and implemented 70 own projects at village level. About 25 persons are trained in the watershed approach.

Capacity building: Since its creation in 1974, Sadguru has implemented different training programmes. In 1995/96 the Sadguru Training Institute was established. Those who are trained are grassroot level workers, government and NGO officers as well as other interested individuals. Sadguru is one of the three organisations, selected by the Department of Rural Development, Government of Gujarat, to train Watershed Development Teams (WDTs). The field based training programmes are related to social as well as technical fields and are based on own experiences of Sadguru in natural resource management. More than 30 trainers are at disposal of Sadguru.

Networking: Sadguru has contacts with various institutions and organisations at local, regional, national and international levels.

Overall characteristics and specifics:
Sadguru is one of the most reputable NGOs in Gujarat working in the field of natural resource development and management. This is due to

its rich experience as well as to its large number of well trained and qualified technical staff. Focusing on water resource and watershed development, Sadguru has provided a noteworthy contribution to the improvement of living conditions in rural areas.

The training institute of Sadguru has a reputation for its variety of participatory training courses, which are based on 25 years of solid field experience. Due to its reputation, it easily cooperates with government departments as well as with banks. It is one of its strategies to link people with government schemes in order to provide additional support to the rural population, especially in fields, which are not covered by projects. It makes considerable efforts in supporting handicraft activities of women through training and support in production and marketing. In this way, the NGO contributes to the economic empowerment of women. Nevertheless, it still sees room for improvement concerning its performance in the field of non-farm activities through various income generating sources. Strategies of women empowerment and the involvement of marginal groups in their projects could be further elaborated and improved. Sadguru has little experience in animal husbandry and is aware of its weaknesses concerning its monitoring system.

Sadguru is a member of different government committees and is in this way participating in a critical discussion of present watershed development policies.

Prakriti Foundation for Natural Resources Regeneration
founded in 1994

Headquarter: Post Box No. 5
Dahod Road
Muwada
Jhalod 389 170
Distr. Dahod
Ph: (02679) 24884
Fax: (02679) 24227

Objectives: Prakriti aims at organising tribals for self-governance and sustainable management of their resources, particularly land, water and forest, for self-sufficiency in terms of their livelihood. The working strategy of the organisation is marked by participation, motivation and empowerment.

Fields of activities: Rural development in the fields of
- watershed development
- water, soil and forest regeneration
- women's organisation and empowerment
- participatory irrigation management
- Panchayat Raj Institution
- Reproductive Health and Child Care Programme

Regional coverage: Prakriti is working in 32 villages of 2 districts of Gujarat (Dahod, Panch Mahals).[5]

Field Offices: -

Staff: Total: 16 (6 female, 10 male); number of staff members in Gujarat: 14

Experience in watershed development: Prakriti has implemented 5 watershed development projects in Gujarat. 8 staff members have been trained in the watershed development approach.

Capacity building for other NGOs: Since 1994, Prakriti is engaged in capacity building for other NGOs in the fields of natural resource management, Joint Forest Management and watershed development.

Networking: Prakriti is an active member of several networking systems of NGOs which are engaged in exchange of information and experience and in policy advocating in various fields, e.g. watershed development and women's issues.

Overall characteristics and specifics:
Prakriti was founded by 7 members of different organisations and institutions, among them, Sadguru, Sarthi, IRMA and the Rajasthan University. The idea was to involve rural areas, which are particularly backward and not yet covered by development activities. The organisation laid its initial focus on the regeneration and sustainable

[5] Prakriti´s work also covers the state of Rajasthan, where it is running 8 watershed development projects. The organisation has a field office in Rajasthan.

use of natural resources such as water, soil and forest. A particular emphasis is laid on awareness building and empowerment of women and resource poor who are motivated to take over responsibility for development processes. Therefore, Prakriti considers the aspects of community organisation and mobilisation as very important for the success of development processes. One of its aims is to enable the rural population for self-governance, and to widen people's involvement in areas of socio-political life, which go beyond their present involvement. Its work is target group oriented and the staff members keep intense contacts at the grassroot level. The organisation considers its knowledge about the physical environment of the project region and its adaptation of the watershed development approach to the local environmental and social conditions as very good. Prakriti sees room for its improvement in the field of pasture development, as well as in the field of monitoring and documentation.

The NGO is also engaged in research activities and the publication of research work, mainly in sociological fields of rural development.

Shree Vivekanand Research and Training Institute (VRTI)
founded in 1975

Headquarter: Nagalpur Road
Near Jain Ashram
Mandvi-Kachchh 370465
Ph: (02834) 20253/20934
Fax: (02834) 20838

Objectives: VRTI aims at assisting rural people in their endeavour to become self sufficient and to raise their socio-economic standard.

Fields of activities: VRTI is engaged in various fields related to rural development:
- agriculture development and research
- watershed development
- improvement of local animal husbandry activities
- renewable energy resources

- employment generation
- health and hygiene
- education
- People's Awareness Programme
- capacity building for other organisations

Regional coverage: VRTI is working in 250 villages in Amreli, Bhavnagar and Kachchh districts.

Field Offices: in Naliya (Kachchh), Dayapar (Kachchh), Shihor (Bhavnagar), Damnagar (Amreli)

Staff: total: 120; number of staff in Kachchh: 55 (0 female; 55 male)

Experience in watershed development: since 1995 until the year 2000 VRTI has been involved in the implementation of 47 watershed development projects. 21 staff members have been trained in the watershed development approach so far.

Capacity building for other NGOs: VRTI has conducted training courses for other NGOs for 5 years. Until the year 2000, staff members of 12 NGOs have been trained in the fields of project planning and implementation, watershed development, bee keeping and biological plant protection.

Networking: VRTI keeps contacts for exchanging information with various NGOs and is a member of networking systems in Gujarat. VRTI also cooperates with government organisations, research centres and the Gujarat Agriculture University.

Overall characteristics and specifics:
The starting point of VRTI´s activities in rural development was in water related fields. VRTI has a 25 years long experience in the field of rural development. Its focus lies on natural resource management. It is also engaged in various activities other than the implementation of rural development projects such as research activities in the field of agriculture. VRTI also edits various publications on issues of agriculture and rural development. In addition, it participates in a vivid exchange of information and research results with different governmental and non-governmental organisations and institutions.

VRTI has a monitoring and evaluation department consisting of 3 members who undertake monitoring tasks on a regular basis.

VRTI identifies its strengths in its contribution to agricultural research and development issues, its performances in water management and soil conservation measures, as well as in employment generation.

Room for improvement lies in the fields of methods and tools related to social fields in the project implementation process. The absence of female field workers may have an impact on the assessment of specific problems, needs and requirements of rural women, as well as on the involvement of women in the development process.

VRTI sees the areas for further improvement of its work in pasture development, afforestation and animal husbandry.

Social Action for Rural and Tribal In-Habitants of India (SARTHI) founded in 1980[6]

Headquarter: P.. Godhar West
Via Lunavada Santrampur Taluka
Distr. Panch Mahals
Gujarat 389 230
Ph: (02674) 83306

Objectives: Sarthi aims at promoting activities related to the management of natural and human resources of rural communities in a participative way. This includes the strengthening of people´s institutions at the village level, the empowerment of women and the encouragement of self-reliance of local communities in the field of health, economic empowerment and education.

Fields of activities: Sarthi is mainly engaged in natural resource management and women´s development:
- water resource development
- women´s development
- agriculture & animal husbandry

[6] Sarthi, as well as other NGOs, evolved from the Social Work and Research Centre (SWRC) in Tilionia, Rajasthan. Therefore, Sarthi´s work also covers regions in Rajasthan.

- community health
- alternative energy
- rural industries
- rural sanitation
- non-formal education
- social forestry & forest protection groups

Regional coverage: Sarthi operates in 229 villages in Gujarat in the districts of Dahod, Panch Mahals, Sabarkhanta and Baroda.

Field Offices: Sarthi runs several small field offices, which also serve as training centres for members of the target group.

Staff: Total number of permanent staff: 61 (15 female; 46 male), 30 of them are working in the head office. In addition, Sarthi has a number of volunteer field workers.

Experience in watershed development: Until the year 2000, Sarthi has been involved in the implementation of 27 watershed development projects in 4 districts of Gujarat.

Capacity building for other NGOs: -

Networking: Sarthi is a member of several NGO-networks.

Overall characteristics and specifics: The initial objective of Sarthi was to improve the drinking water situation in drought prone areas. It then shifted the focus to leadership development and the promotion of organised action by groups of underprivileged sections of the community, particularly women. The focus of the organisation lies on the binding of local natural and human resources to the regional context, which means the support of local crafts, the employment of local personnel as field workers, and the development of a functioning regional community.

Its projects are promoted from the field centres, and are managed in a decentralised way, using participatory planning methods. Sarthi shows good knowledge about social methods and tools such as participative approaches and strategies for conflict resolution. The organisation applies a qualitative monitoring system. Comprehensive qualitative monitoring is done by an interdisciplinary team on a regular basis. Proper training of the staff members is considered as crucial for successful projects.

The strengths of the NGO lie in the fields of community organisation and mobilisation, empowerment and the promotion of self-reliance and self-responsibility. Sarthi keeps intense contacts with the target group by employing more field workers than required by the governmental guidelines. Sarthi stated that besides the various positive impact of the employment of local field workers, it is sometimes difficult, to create a common understanding between locally recruited staff and members of the organisation about which implementation philosophies should be applied for reaching development aims.

Utthan Development Action Planning Team founded in 1981

Headquarter: 36, Chitrakut Twins
Management Enclave
Vastrapur
Ahmadabad 380015
Ph.: (079) 6751023, 6750213
Fax: (079) 6754447
e-mail: utthan@Iwahm.net

Objectives: Utthan strives to establish and support self-reliant local groups in resource poor rural areas, which can handle the development process on their own.

Fields of activities: Facilitation and implementation of community based natural resource management development processes and programmes under:
- Tribal Area Development Programme
- Centre for Drinking Water Resource Management Programme
- Coastal Area Development Programme
- Technical Innovation Projects

Regional coverage: Dahod, Bhavnagar, Amreli, Patan

Field Offices: Dahod, Bhavnagar and Amreli

Staff: Total: 43 (15 female, 28 male)

Experience in watershed development: Since 1995, has been involved in the implementation of 20 projects in 3 districts (Dahod, Bhavnagar, Amreli) Until the year 2000, 20 persons were trained in the watershed development approach.

Capacity building for other NGOs: Since 1995 in the fields of water resource management and gender, 5 to 6 trainers, own training facilities and guesthouse are available.

Networking: Active in three NGO networks, two of them founded by Utthan:
- Pravah: 125 to 150 NGOs working on the issue of drinking water supply
- Mahila Swarajana Abhiyan: 65 NGOs working on the topic of women empowerment

Overall characteristics and specifics:
Utthan lays its emphasis on the treatment of coastal areas with their specific problem of salinity, and on the issue of drinking water supply. It considers it as very important to embed the management of natural resources in the overall socio-political and ecological context of the respective region. Utthan is engaged in the enhancement and upgrading of skills and knowledge of the target group. Special emphasis is put on recognising and respecting the indigenous knowledge of the people. Utthan encourages community participation with a particular focus on women's groups.

Utthan considers the exchange of information and experience with other NGOs as crucial for success. Furthermore, the promotion of new policies for rural development is seen as very important. In this regard, Utthan is already actively involved in various networking systems.

Utthan sees its strengths in community organisation and mobilisation, empowerment of resource poor, gender issues, and the realisation of participatory approaches. The field workers keep in close contact with the target group and have a good ability to motivate people. In addition, Utthan assesses its skills in water conservation measures as very good.

Skills which could further be elaborated lie in the fields of agriculture development and pasture development, as well as monitoring and evaluation. Furthermore, the number of technicians could be increased.

VIKAS Centre for Development
founded in 1978

Headquarter: 101/102 Padmashree Apartments
9, Shantipath Society
Near Dada Saheb Pagla
Navrangpura
Ahmadabad 380 009
Ph: (079) 6403061
Fax: (079) 6401796
e-mail: saveltd@ad1.vsn1.net.in

Objectives: VIKAS aims at addressing the issue of poverty and under-development through the process of awareness generation leading to initiation and strengthening of organisations of economicly, socially and educationally deprived people. Its approach emphasises experiential learning through the continuos cycle of action and reflection, leading to greater awareness, sensitivity and empowerment of people.

Fields of activities:
In rural areas VIKAS focuses on:
- poverty alleviation through collective income generation Programmes
- gender integration
- regeneration of natural resources in the coastal areas of Gujarat
- micro credit and enterprises
- initiating and strengthening democratic village level institutions

Regional coverage: VIKAS is working in Bharouch and Vadodara districts in Gujarat. It covers 230 villages.

Field Offices: VIKAS has six field offices in Jambusar, Amod, Vagra, Hansod and Ankleshwar.

Staff: Total: 45 (17 female, 28 male)

Experience in watershed development: Experience since 1995; until the year 2000, VIKAS has implemented 13 watershed development projects; 6 persons were trained in the watershed approach.

Capacity building for other NGOs: –

Networking: VIKAS has a vivid exchange of experience and knowledge with other NGOs and regularly attends meetings and workshops. It is a member of the Sajata network.

Overall characteristics and specifics:
The work of VIKAS is based on the principles of empowerment and equity. The NGO considers itself as a facilitator, which supports empowerment processes in a village by forming suitable platforms for disadvantaged groups. An example for a successful strategy of women empowerment are the legal centres for women created by VIKAS in order to generate awareness among women concerning legal issues and to provide them with legal support. Empowerment is also an important part of the watershed development projects of VIKAS. According to its motto, watershed for all, VIKAS makes a lot of efforts to involve all subgroups in its projects. Furthermore, VIKAS focuses on an equal distribution of benefits. In this regard, at least 30 percent of the project budget should be for the benefit of the poorest groups in a village. VIKAS selects villages according to their degree of poverty. In order to cope with possible conflicts, it integrates conflict resolution strategies in its capacity building programmes for villagers.

As VIKAS works mainly in coastal areas, its watershed approach is adapted to the particular problems of this ecological unit, such as the problem of salinity. VIKAS initiated the Saline Area Vitalisation Enterprise (SAVE) which acts as an associated organisation and provides technical services in planning and implementation of natural resource regeneration activities.

Within the Integrated Wasteland Development Programme, VIKAS encouraged landless agricultural labourers to access unutilised public wasteland. Eight co-operative societies were created and, with the support of VIKAS, these cooperatives received from the government a total of 1144 ha of saline wasteland on lease for 20 years. In order to improve the quality of land and water, VIKAS has undertaken watershed development projects on these lands.

VIKAS sees its own strengths in the fields of community mobilisation, conflict resolution and in its deep knowledge about the physical environment of their project area. It sees further room for improvement in the fields of pasture development and animal husbandry.

Annex 4: Questionnaire for the analysis of Non-Governmental Organisations

Name of the NGO: _____

Interviewed person: _____

A Generalities

1. Could you give us a brief overview about the goals / objectives of your organisation?
2. What are the main activities of your organisation?
3. In which governmental programmes / schemes are you involved?
4. Who is your main target group?
5. What are names of the districts you are working in?
6. How many villages are you currently working in?
7. What is the total number of villages you have reached in the past?
8. Who is funding your organsisation?

B Staff and equipment

1. Staff

Total number of staff: _____ (female: ___ male:___)

Work experience and qualification of professional staff working mainly in the field:

Fieldworker	**Male**	**Female**
1. Total number		
2. Experience:		
> 5 years work experience		
< 5 years work experience		
3. Qualification:		
Graduates		
Non-graduates		
4. Technical/ social background:		
Technicians		
Social scientists		

Task and qualification of all women-workers:

Female worker	*Field of activity*	*Office bearer*	*Qualification*
1		Yes Y no Y	Dipl. Y graduate Y
2		Yes Y no Y	Dipl. Y graduate Y
3		Yes Y no Y	Dipl. Y graduate Y
4		Yes Y no Y	Dipl. Y graduate Y

2. Material and technical equipment

Number and location of offices:

Number of computers:

Media (videos / own publications/ others)?

Training facilities (training building/ hall/ OHP/ slide projector/ charts/others)?

Guesthouse?

Technical equipment/ machines?

C Skills

1. Please assess the skills of your organisation in the following tasks/ fields (5=very good, 1=still to be improved)

Task/ field	1	2	3	4	5
Soil conservation measures					
Water conservation measures					
Afforestation					
Agriculture development					
Pasture development					
Animal husbandry					
credit					
Experience in Watershed Dev.-approach					
Knowledge about physical environment of project region					
Knowledge about target group					
Awareness/ use of indigenous knowledge					
Intensity of relation to target group					
Strategies of participatory approach					
Conflict resolution ability					
Ability to motivate people					
Ability to teach people					
Ability to reach all subgroups					
Monitoring system					
Regional coverage					
Methods to adapt WD-approach to regional (social/ environmental) specifics					

Comments:

2. In which fields do you see the strengths of your organisations?
3. In which fields could you improve your performance?

D Networking and Capacity building

1. Do you have contacts with and an exchange of experience with other NGOs / institutions?
   Are you integrated in a network system?
2. Do you have contacts with and cooperation with government agencies?
3. Do you have contacts with research institutes in the field of rural development?
4. Are you active in the field of capacity building or consulting for other NGOs?
   Since when?
   For whom?
   In which fields?
   Training in technical and / or social skills?
   By which training methods?
   Number of trainers?
   Number of persons trained per year?
   Duration of training courses?
5. What do you think are the capacity building needs of NGOs in WD-approach?
   Social aspects:
   Technical aspects:

E Questions concerning Watershed Development activities of the NGO

1. In how many WD-projects is your organisation involved in at the moment?
2. How many Watershed Development projects have been implemented by your organisation so far?
3. What was your motivation to work in the field of Watershed Development?
4. How many members of your organisation have been trained in the WD approach?
5. In which training centres / training institutes?
6. In which fields do you think further training for your staff would be helpful / necessary?
7. Number of staff working in Watershed Development?
   No. of technical staff _____/ male:_____ female:_____
   No. of social scientists ____/ male:_____ female:_____
8. What is the composition of a Watershed-Development-team?
9. How many watersheds are generally supervised by one Watershed-Development-team?
10. For how many WD-projects do you have capacity?
11. Concerning PRA-phase in the beginning of a WD project:

- Duration of the PRA-phase?

- What is the composition of the PRA-team (gender, qualification)?
- Methods / tools used?

12. Which subgroups exist in the watersheds you are working in?

1._____ 5._____ 9._____
2._____ 6._____ 10._____
3._____ 7._____ 11._____
4._____ 8._____ 12._____

13. Which subgroups are you working with?

What are the benefits of the project for the specific subgroup?

What are the (potential) negative impacts of the project on the subgroups?

SUBGROUP	BENEFITS	NEGATIVE IMPACTS

14. Which methods/ tools did you use to identify these interest groups/ subgroups?
15. What kind of maintenance structures do you implement to guarantee the sustainibility of your projects after implementation phase?
16. Do you establish linkages with other programmes / schemes in order to solve problems which are not addressed by watershed approach?
17. How is the coordination / cooperation of PIA with:

- District Line Departments
- Forest Department
- Banks

18. Why didn´t the villagers undertake measures by themselves before project implementation?

F Questions concerning Watershed Development approach in general

1. Which guidelines are relevant for your Watershed Development projects?
2. Did you meet difficulties concerning the realisation of certain guidelines?
3. What are your suggestions to avoid / solve these dificulties / problems?

4. What is your critique (positive / negative) of the Watershed Development concept in general?
5. What do you propose to improve the implementation phase of a Watershed Development project ?
6. Do you think that the budget for the different components of the programme is realistic?
7. Do you think that the time-budget for the different phases of the project is realistic/ sufficient?
8. What are the most important tasks of a PIA concerning Watershed Development? (please rank)
9. What are the main problems of the people in your project region?
   (please rank)
10. Is the Watershed Development approach able to solve these problems?
11. What should be, in your eyes, the most important factors for selecting a watershed for a new project?

Annex 5: Guiding questions for interviews and observations during the field visits with selected NGOs

- Beginning of the project?
- Embedded in which programme?
- Composition of the WD-team?
- How often are the field workers in the village?

Environment	**ha**
Total area	
Forest land	
Common land	
Irrigated area	
Average size of a holding	
Population	**Families**
total	
SC/ST	
Farmers	
Landless	
Breeders	
No. of animals	
Craftsmen/ -women	
Literates	

- Main environmental problems specific to the region (salinity, …)?
- Were these problems addressed in the project plan? How? Successfully?
- Main social problems?
- Were these problems addressed in the project plan? How? Situation after project?
- Which subgroups are you working with?
- What are the benefits of the project for the specific subgroup?
- What are the (potential) negative impacts of the project on the subgroups?

SUBGROUP	BENEFITS	NEGATIVE IMPACTS

- Who profited most?
- Did you help the people who could not directly benefit from the project to get support of other programmes/ projects/ funds (women project, credit, handicraft,…)
- Which methods/ tools did you use to identify these interest groups/ subgroups?
- How did you establish the contact (with all subgroups)?
- How intense is the contact (with all subgroups)?
- Beside the gram panchayat are there other institutions functioning within the village?
- What is their purpose and membership profile?
- What has been done to integrate these structures in the WD-Plan/ community organisation process?
- What is the composition of the Watershed Committee? Were non-villagers also members?
- When was it formed? How?
- Difficulties / conflicts in forming the Watershed Committee?
- How often does the Watershed Committee meet?
- How often does the whole village community meet? Who attends these meetings (subgroups)?
- Which villagers were trained in which fields? Where?
- Were there any conflicts between subgroups or between subgroups and NGO during project implementation phase?
- If so, have these problems been solved?
- Who was involved in the realisation of the watershed plan?
- What difficulties/problems were faced?
- Did practices in the field of natural resource management already exist in the village? What and by whom?
- If not, why didn´t the villagers undertake measures by themselves before project implementation?
- What are the most important tasks of PIAs concerning WD?
- Which of the field workers are originally out of the region?
- Where do you get the cards and data you are working with from?
- Did you adapt the WD-approach to the specific regional context?

- How did you empower the people? Is there a certain strategy (different for the subgroups)?
- Have you been successful in empowering the village community?
- Is there still a need for empowerment?
- Did you build up maintenance structures? How? What kind of structures?
- Does the village still need help from the NGO to maintain the structures implemented?
- Do you think that the village is implementing measures on their own in the future?
- Was there a PRA-phase? How long did it last? Which tools were used? What is the PRA-team-composition?
- Do you think that the time-budget for the different WD-phases are adequate?
- Is the financial budget appropriate?

Annex 6: Guiding questions for interviews, observations and transsect walks during the target area analysis[1]

- Introducing questions about water situation, agriculture (cultivated crops, soils), social groups, settlement patterns, main occupations etc.

Water situation

- Which different water sources are available in the village/on the fields?
- What is the importance of different sources?
- Which are the preferred sources and state reasons for preference?
- How is the quality of water from different sources?
- Is there a variation of water availability throughout the year? (Further explanation)
- For which purposes is water used?
- Which water source is used for which purpose?
- What are the needs and requirements concering this issue?

Small/marginal/large farmers

- Cultivated crops;*kharif*/*rabi;*cash crops/food crops
- Crop rotations
- Marketing possibilities of agricultural products
- Working seasons; migration; importance of agricultural production; other sources of income
- Water requirements of different crops
- Rainfall this year and in the last years
- Organisation of water management; rainfed; crops; irrigation; distribution of irrigation water between different crops; technology of irrigation; where does irrigation water come from; traditional water harvesting methods
- Erosion problems (wind/water); what are you doing against soil erosion and erosion in general; indicators for soil erosion
- Salinity of soils and irrigation water
- Yields of the last years; fertilisers
- Wasteland management; private/common land; land ownership
- Access to information, public properties and resources
- What do you think you would need to improve your situation?

Animal husbandry/nomads

- Which kind of animals are kept; number in the last years; on which factors does the amount of animals kept depend?

[1] Many of the questions listed in this Annex were not used as direct questions for the persons interviewed but were used as mnemonic aid for the researchers concerning the information that had to be collected during the interviews and observations.

- How is milk collected and sold?
- Working seasons; migration; importance of animal production; other sources of income.
- Forage cultivation; for which animals?
- Which animals are on the wastelands; access to wastelands; who decides where to go?
- Deterioration of wastelands in the last years; indicators for wasteland deterioration; quality of wasteland plants.
- Where do you get the water for your cattle from? Is there any problem with this?
- Is there anybody using the ground except you? (private/common land)
- What do you think you would need to improve your situation?

Landless people

- What kind of help do you get from the Government?
- What kind of work are you engaged in throughout the year? (daily work for other farmers?)
- Employment in agriculture: on what factors does employment in agriculture depend?
- What do you think you would need to improve your situation?

Use of forests

- What kind of energy is used for household etc.?
- What kind of forest is in the surrounding of the village area?
- Who uses the forests and for which purpose? (gender; firewood/food stuff/medicinal plants)
- Who has access to the forests?
- Deterioration of the forests in the last years; indicators; what is done against the deterioration of the forests?
- Do cattle graze in the forests?
- Do you face erosion problems because of deforestation?
- What do you think would be needed to improve the situation?

Family/housing

- What is the prevailing family concept: joint family or nuclear family?
- How are the houses distributed in the total area of the village?
- What is the condition of the houses: *kaccha* or *pucca*?
- Is electricity available? In the whole village or only in parts/some houses?
- Are there any furnishings or decoration in the houses? (indicators for wealth/poverty)

Economic activities (other than agriculture)

- Which are the existing economic activities besides agriculture?: e.g. agriculture related: food processing; specialisations such as manufacturing and handicrafts; labour work outside agriculture; shop-keeping; transportation; others. Who does it? (gender; age; social group)
- What are common economic activities in the village; village-wise or individually organised? Who does it? (gender; age)

- Are the activities regular/irregular?
- Is it a main/additional activity?
- What is the estimated contribution to the family income?
- Is there potential for future economic activities, e.g. through improvement of an exisiting activity, or through innovation/introduction of economic activities common in the region?

Migration

- Is migration common? Among all social groups?
- Why do people migrate? What kind of work do they do during migration?
- Where do they migrate to?
- How long do they migrate?
- Which family members migrate? (gender; age)
- What are the problems caused by migration? (e.g. fields and houses are abandoned, children cannot attend school, communication between villagers concerning common problems is not possible, etc.)
- Do the migrants send money/goods home to family members staying in the village?

Non economic activities including housework

- What is the every day routine of women of different social groups?
- (especially for cross-checking:) Who collects water and firewood? (gender; age)
- Who cooks, cleans, washes, takes care of children, milks the cattle? (gender; age)
- Where is the water collected from and for what purposes? or: To which water sources do the people go for different purposes? (drinking, cooking, bathing, washing, cleaning)
- How many times a day is water collected?
- What are the different habits of different social groups concerning water collection? (who; from where; along which way; when; how often)
- Is the water for drinking treated in any way in order to purify it? (filtering/boiling)
- (especially for cross-checking:) where does the cattle go for drinking?

Health

- Which are the common health problems/diseases in the village?
- Is primary health care facility available in the village? others? (private person/midwife)
- If not, where is the next primary health facility?
- How do people get there?
- Is traditional medical knowledge present and practised in the village?
- What are the main food items?
- Is there consumption of animal products? (milk, dairy products, meat, eggs; by which social group)
- Are there any health problems related to the consumption of contaminated water? (e.g. worms)

- How is the health status of different subgroups? (wealth; gender; age)
- Check malnutrition-related visible indicators: goitre (iodine-deficiency), milky eyes/loosing eye sight (vitamin A-deviciency); marasm/kwashiorkor (oedema/big belly etc.) (protein-energy-deficiency); paleness/tiredness (iron-deficiency)
- Is there abuse of home made liquor (containing methylic alcohol)? (long-term indicators: stupidity, blindness) By whom? (gender; age)

Education

- Is there a primary school in the village? What about higher education?
- What are the conditions of the school building, interior etc.
- How many teachers work in the school? Do they live in the same village?
- Do they participate in the decision making process in the village? Do they try to organise the farmers or advise them concerning their problems?
- Is education important for the families, and why?
- How many children go to school (registered/normally/today)? How many girls and boys (dito)?
- Why do children not go to school?
- Who finishes primary school? (gender; social group)
- Do they visit the school in other villages?
- How is the literacy situation among adults? (gender; age)
- Is there an adult education programme working in the village?

Subgroups/social groups

- Which different subgroups can be identified? (gender; age; cultural aspects; wealth etc.)
- How is their specific situation in the village? (resources; workload; wealth etc.)
- How many and which social groups live in the village?
- How many families belong to each social group? Do the live mixed or among their own social group?
- How is the relation between the social groups?
- Which groups have problems with other groups?
- Which groups have a good relation? (personal relations; neighbourhood help)

Communication and decision making

- How and in which occasions do the villagers communicate with the other people of the village? (with the other social groups; with people living further away)
- Are problems concerning the village discussed among the villagers? If so, who takes part (actively)? (gender; age; social group)
- How often do the people in the village come together to talk about common problems?
- Are there formal village meetings to discuss problems concerning the village?

- How is the communication between men and women?
- How often do you get news from the other hamlets (Dahod)?
- If there is a problem in the village, what do you do?
- How are important decisions made in the village?
- Who takes final decisions on village level?
- How is the decision making process at home? Do men and women discuss together about problems in the household and fields? Do they discuss or talk about problems in the village? Can the women express their own opinion? Who takes the last decision?
- How are the relations between the farmers/social groups and the *sarpanch*?
- Does the *sarpanch* call the farmers from all subgroups/social groups or hamlets to a meeting to discuss about common problems?
- Who decides which farmers and which parts of the village get facilities like hand pumps, electricity access etc. Does the *sarpanch* favour one group before others concerning those facilities?

Annex 7: Common Approach for Watershed Development (Watershed Development Guidelines)