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ABSTRACT

Prerequisites which Foster Change within Rural Community Development: A Case Study of Drinking Water Initiatives in Gujarat

by Shawna O'Hearn

April 1996

There are certain prerequisites which foster social and environmental change within community development. The qualitative data will be organized to reveal the nature and interconnectedness of the complex issues within community development. Four prerequisites are identified including the role of the change agents; community development process; gender relations; and village leadership and awareness. An initiative by two Gujarati voluntary organizations is used in order to explore these prerequisites within rural development.

The development initiative responds to the state's serious environmental and natural resource management problem i.e., the shortage of drinking water. In order for the water to remain potable, it must be protected from the saline soil and the shallow groundwater. To achieve this, surface ponds are lined with thick plastic sheets to prevent salinization. This alternative rain water harvesting system incorporates traditional knowledge with technology.

However, the belief held by voluntary organizations is that purely structural and technical solutions to water resource problems are not economic or sufficient to resolve the problem. The voluntary organizations' solution includes a technical component while incorporating the community at all levels of decision-making in the programme. One of the long term goals of a community development initiative should be to effectively organize villagers so they can better their living conditions.

In order to address the issue of change within rural development, five villages were selected and analyzed through a comparative framework. The four phase comparative analysis framework incorporates various disciplines including economic, political, environmental, psychological and sociological aspects when critiquing the five villages. The goal is to reach a common comparative framework which can be used to make conclusions regarding the development hypothesis.

For Nirubahen and our parents, Fran and Bernie

ACKNOWLEDGEMENTS

This report developed from collaborations with the Utthan and Mahiti staff. Each team member supported and helped me during my time in India. They generously translated; answered my numerous questions; taught me Gujarati and how to cook; showed me Gujarat through their eyes; gave me lots of chiah; and allowed me to job shadow for nine months. Above all, they became my extended family and closest friends. I hope that I will be able to repay others with the kindness, patience and dedication that they always showed me.

The women from Kamatalav, Navagam Kama, Mingalpur, Anandpura and Rajpur will always remain very close in my heart. A special mention to Gauribahen, Bhanubahen, Mancoobahen, Jogevabahen, Shantabahen, Samoobahen, and Lamybahen who took me into their homes and families.

The Aga Khan Foundation (Canada) and AKRSP (I) gave me the initial opportunity to work in Gujarat and encouraged me through the confusing and challenging moments. Barry Underwood and Meena Bilgi helped me to connect cultural issues to my new knowledge. My fellow IDM participants showed me the importance of being myself in all situations.

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During my academic career, I spent a great deal of time at the International Education Centre where I was forced to think creatively and to work on exciting projects which showed me the true importance of development education. This work and the friendships that developed from the centre will always be valuable to me.

A special thanks to my family who have always fully supported me and stood by me through the thick and the thin. Without your love and support, I would never have completed this report.

I would like to emphasize that the final product is my responsibility and any omissions or inconsistencies rest on my shoulders.

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ACRONYMS

AKFC	- *Aga Khan Foundation Canada*
AKRSP (I)	- *Aga Khan Rural Support Programme (India)*
ARG	- *Area Resource Groups*
ASAG	- *Ahmedabad Study Action Group*
FWWB	- *Friends of Women's World Bank*
GJTI	- *Jal Seva Training Institute*
GWSSB	- *Gujarat Water Supply and Sanitation Board*
IDM	- *International Development Management Programme*
IDS	- *International Development Studies (Saint Mary's University)*
IPCL	- *Indian Petro-Chemical Limited*
NGOs	- *Nongovernmental Organizations*
RWSS	- *Regional Water Supply Schemes*
VOs	- *Voluntary Organizations*

TRANSLATION

Bhal - Gujarati term which means "forehead where nothing grows" There is a region in Gujarat which is called the Bhal because of the harsh conditions that allow nothing to grow on the land.

Darbar - moneylenders within the caste system

Koli Patel - division within the caste system

Mahila Mandals - women's organizations at a grassroots level

Mahiti - Gujarati term which means "information". It is also the name of a local voluntary organization.

Panchayat - the political organizing body in the village, traditionally with five members

Sarpanch - elected village leader

Talav - traditional village pond

Utthan - Gujarati term which means "upliftment". It is also the name of a local voluntary organization.

CHAPTER ONE

INTRODUCTION

1.1 Background

This report reviews the history of alternative drinking water systems, attempts to examine the strategy behind women, men and village decisions, and draws a picture of the scenario which is occurring in the villages of rural Gujarat.

The purpose of this study is to explore and describe rural community development in Gujarat and the implications that social and environmental change have on a development initiative. Bereday's comparative analysis is used as a framework for the study. The literature on community development, drinking water, gender, environment and development helped inform the investigation. Qualitative data was collected using participant observation and semi-structured individual and group interviews.

1.2 Practicum Requirements

This document is the final component for the completion of a Master of Arts in International Development Studies (IDS) from Saint Mary's University. I examined the research information and, through supervision from the IDS department, decided to write a practicum report.

According to the International Development Studies programme, the requirements for a practicum require the student to:

- describe a development problem, identify the conditions that gave rise to the problem, its various dimensions and whom the problem effects;
- describe the program and/or project that was set up to deal with the problem,
- analyze the program and/or project and the process of implementing it;
- evaluate the project and its results in relation to the problem at issue, and
- use an analytical and descriptive approach.

A practicum report will be beneficial for the two Gujarati organizations (Utthan and Mahiti) which require documentation of their work. More importantly, there is a need to analyze the information and to assist development agency recipients to manage the change process. This report provides an analysis of the research as well as conclusions and recommendations which aim to assist the Gujarati voluntary organizations, government departments and academics to address the increasingly problematic drinking water situation in the state as well as women's participation within natural resource management.

1.3 Purpose of the Study

The development hypothesis for this research project emerged from an evolutionary process which included a literature review, field research and continuous analysis of the information in Canada and India. The qualitative data will be organized to reveal the nature and the interconnectedness of the complex issues within

community development. An initiative by two Gujarati voluntary organizations is explored as a case study. This initiative responds to the state's serious environmental and natural resource management problem i.e., the shortage of drinking water.

There are certain prerequisites which foster change within community development. Drinking water initiatives are also influenced by these prerequisites to change. Four of the proposed prerequisites include the role of change agents, gender relations, the community development process and village leadership and awareness.

Role of the Change Agents

Voluntary organizations[1] and community-based groups play an important role within community development. Utthan and Mahiti, two local voluntary organizations in Gujarat, are one group explored in this research report while the community-based groups include Mahila Mandals[2] and water committees. These change agents portray two levels and perspectives within community development. The voluntary organizations establish and support self-reliant local groups which ultimately handle the development process on their own (i.e. Mahila Mandals and water committees). The local community-based groups support development directly within their communities and villages.

---

[1] "Voluntary organizations" will be used in this report to refer to Utthan and Mahiti. The term "Nongovernmental organization" or "NGO" is considered to have a negative connotation.

[2] Community-based women's groups.

Gender Relations

The research attempts to understand the need for voluntary organizations to follow a gender analysis as opposed to a "women and development" perspective within community development initiatives. The Gender and Development (GAD) approach believes in the empowerment of women in order to improve their position in society relative to that of men. The focus of this practicum report is on natural resource management in a rural community setting. Taking this focus and the GAD definition into account, the Gender, Environment and Development (GED) approach explores the "gender relations within a social framework related to sustainable development" (Shah et al., 1995: 75). This research will follow a GED approach through an examination of the gender component within community development, especially the management of drinking water initiatives.

Community Development Process

The drinking water situation is very serious in the state of Gujarat. The belief held by voluntary organizations is that purely structural and technical solutions to water resource problems are not economic or sufficient to resolve the problem. The voluntary organization's solution will include a technical component while incorporating the community at all levels of decision-making in the programme. One of the long term goals of a community development initiative should be to effectively organize villagers so they can better their living conditions.

This research examines the use of alternative technology to enhance traditional systems. It is important for the local men and women to have a felt need for the new technology This technology must also be durable, easy to maintain and inexpensive in order to be sustainable within a rural village. Installation of the technology should be complemented with training for the men and women in the village which will enable them to manage, maintain and repair their new and old water systems. A drinking water initiative and a community development project require careful planning and facilitation. It is the process of this planning and facilitation which assists in the developmental change within the village. It is important to review and analyze this process.

Village Leadership and Awareness

The research attempts to examine the differences between villages in Dhandhuka taluka in order to determine why some community development initiatives are successful while others are not successful. During the initial community development process, the community organizers identify informal leaders (women and men) within the village. It is also important to determine the role these leaders play within the village and specifically within a potential community development initiative.

The second component of this prerequisite is the village's awareness which incorporates issues of empowerment, participation and acceptance of environmental and social change. The degree of awareness within the village and among the

formal and informal leaders is a necessary aspect in preparing a community development initiative, especially in the drinking water sector.

1.4 Research Partners

The development hypothesis is explored through a review of the relevant literature, field research carried out in Gujarat, and a comparative analysis of the information. The field research included a nine month work term with two local development organizations in Gujarat: Utthan and Mahiti. Utthan is a voluntary organization based in Ahmedabad, Gujarat. Utthan's mandate is to establish and support self-reliant local groups that can ultimately manage the development process on their own. Utthan began its work by supporting the establishment of a local rural development organization known as Mahiti. In 1994, Mahiti became an independent voluntary organization while continuing to work closely with Utthan on various initiatives, particularly within Dhandhuka taluka.

I worked closely with Utthan, Mahiti and the Centre for Drinking Water Resource Management[3]. The Centre for Drinking Water Resource Management (CDWRM) was initiated by Utthan as a response to the increasing demand for advice and help from individuals and agencies interested in Utthan's experience in providing or improving drinking water availability in the drought prone and saline areas in Gujarat. The centre proposes to enhance and expand the drinking water resource

---

[3] More information is available on Utthan, Mahiti and CDWRM in Chapter Four.

management activities to other parts of Gujarat and India by sharing experiences, information and socio-technical knowledge with governmental, private, public and other voluntary sector agencies interested in empowering communities in managing their own local resources.

1.5 Significance of the Study

This practicum report expands on several components within community development, including alternative drinking water initiatives, gender and the NGO movement. The first component is the alternative drinking water initiatives through community participation, which is believed to play a critical role in the future resolution of the state's serious water problem.

This research report also addresses the gender component within natural resource management which is often overlooked by practitioners, academics and government officials. "There is a serious lack of understanding of gender in society, and its implication for development. Much of the research in water resource management contains almost no significant mention of gender" (Conway and Lambrou, 1995: 6). This practicum provides documentation of a gender analysis within drinking water activities in order to help fill the void within the literature.

The literature on drinking water also overlooks another important aspect within this sector, especially within India. This aspect highlights the weakness of the "documentation on the NGO movement in the area of water resource management

and its dissemination" (Venkateswanan, 1992: 4). The voluntary organization, Utthan, attempts to bridge this gap by using various alternatives through their Documentation and Communication Unit. They document their initiatives through photographs, slides and videos. Utthan also produced several documentary films showing the drinking water problem as well as the initiatives of the people supported by voluntary organizations, i.e. Utthan and Mahiti.

Documentation of voluntary organization's initiatives within natural resource management is necessary to raise awareness, provide support to other voluntary organizations (and NGOs) working in the field and also to use as a tool to lobby the government. It is believed that the government can play a more participatory role within natural resource management in Gujarat.

> "NGOs are attempting community participation in developing water management strategies which are suitable for their localities and implementing them. But they are often not well documented thereby fail to make impact at the policy level. This results in such approaches not being accepted by government agencies for large scale implementation" (Viksat, 1993: 43).

Utthan addresses this concern through their support of a research project which examines the state's drinking water situation. The written report from this research offers an excellent overview of the problems and some attempts by the government, community and NGOs to address the issues.

Utthan and Mahiti receive positive feedback and support on their drinking water initiatives from villagers, government, other voluntary agencies and academics.

However, the documentation available on these interventions focuses on the technical aspects of the initiatives and individual case studies. Unfortunately, little written documentation highlights the process of Utthan's community development activities or conducts a comparative analysis of its work. An objective of this research is to assist Utthan through documentation of its community development process within the drinking water initiatives. There is a need to explore, analyze and document the involvement of the community, particularly women's participation and management of these systems.

1.6 Research Purpose

It is necessary to highlight the dual purpose of this research project. First, the information is compiled into a report for the voluntary organizations; Utthan and Mahiti. The objective of this report is to attempt to enhance the work of the voluntary organizations in rural villages, especially their drinking water initiatives in Gujarat. The voluntary organizations can use the report and its comparative methodology to assist in the planning and monitoring of their community development initiatives. At the policy level, this research can be used as an instrument to lobby the state government regarding drinking water programmes.

Secondly, this report attempts to make a contribution to the community development, gender and water literature. It also aims to raise awareness of alternative water harvesting techniques as well as women's role within the management of drinking water systems.

1.7 Practicum Outline

This practicum report is arranged into seven chapters beginning with the Introduction in Chapter One. This chapter outlines the development hypothesis as well as the purpose and significance of the research in relation to the development literature and field work.

Chapter Two reviews the drinking water situation in Gujarat with a brief summary of the geo-climatic environmental conditions which affect the drinking water sector. There is also an outline of the government technology and policies implemented in the state since the 1960s.

Chapter Three explains traditional water management systems found in Gujarat. An example of alternative technology which is used to enhance traditional rain water harvesting systems is highlighted. This chapter also shows the role of community participation in addressing specific water problems.

Chapter Four examines the philosophy, approach and history of the change agents. This chapter includes definitions which follow the work of the change agents in rural Gujarat. The concepts include the difference between communities and villages, a discussion of empowerment; consciousness-raising; and participation. An understanding of these concepts will assist the reader throughout the remainder of the document.

Chapter Five outlines the research methodology and the process used to determine village selection for the case study. Challenges to the data collection are also highlighted to ensure the reader has a full understanding of the research.

Chapter Six deals with the comparative analysis of the five villages. Drawing on the framework developed by George Z.F. Bereday (1964), a four step comparative analysis used includes the "descriptive," "interpretative," "juxtaposition" and "comparative" phases of the comparative methodology.

Chapter Seven addresses the analysis as well as a final conclusion of the information. An extensive appendix is included to offer further information for the reader.

CHAPTER TWO

DRINKING WATER SITUATION IN GUJARAT STATE

2.1 Drinking Water Situation in Gujarat State

The state of Gujarat suffers from a serious drinking water shortage and this problem is extremely grave in the rural areas. Drinking water supply difficulties are experienced in 14 000 of the total 18 000 rural villages in Gujarat (Barot, 1992: 10). Most villages in Gujarat rely on rain water throughout the year yet the only rain is during the monsoon season (June to September). By the arrival of summer, in March, there is barely enough water to survive. The problem is exacerbated when the state experiences a drought. During a drought period, about "70 - 75% of the state villages suffer from drinking water problems" (Barot, 1993: 5).

The situation continues to deteriorate across the state. The government, NGOs and academics are working together to understand the complexity of the issues. The drinking water scenario is not uniform across the state and the diversity of the issues makes it difficult to resolve the problems. Hirway and Patel (1994) conducted a study of the water situation in Gujarat and, as a result of this study, the state's water situation has been divided into the five problem areas explained below.

(1) the eastern tribal belt where large scale deforestation has resulted in low water retention and depleting water resources on one hand, and soil erosion on the

other (including the Panchmahal where Utthan's Tribal Area Development team is working)[4];

(2) the northern arid and semi-arid regions where deforestation and mismanagement of water resources results in the depletion of groundwater tables as well as desertification;

(3) the coastal saline regions of Saurashtra and around the Gulf of Cambay where salinity is increasing in land and water resulting in a decline in vegetation (Dhandhuka taluka is included in this region);

(4) the canal irrigated areas of central and south Gujarat where overuse of water for cultivation increases waterlogging and salinity of the soil, and raises the water table to dangerous levels; and

(5) the regions in central Gujarat and Saurashtra where overuse of groundwater results in agricultural prosperity which is now difficult to sustain because of the dangerously deepening groundwater resources and/or deteriorating quality of groundwater (Hirway and Patel, 1994: 10).

Before addressing the specific case study, it is important to have a better understanding of the drinking water situation and government schemes implemented to deal with the problems in the rural areas. These strategies have tended to make people dependent on the welfare programs of the government, deplete natural resources and increase the drinking water problem in the rural areas.

---

[4] Refer to the map in Appendix 1.

2.2 Drinking Water Problems in Gujarat State

Out of 18 000 villages in Gujarat, there are more than 14 500 villages which are officially recognized as no-source villages[5] The problem goes beyond the issue of low rainfall by highlighting the mismanagement of available resources The state suffers from a natural uneven distribution of water resources However, the roots of the state's drinking water problem lie in four categories

- mismanagement of water resources (i.e. over drafting of groundwater, neglect of rain water and mismanagement of surface water),
- total neglect of traditional water management systems at the village level,
- general environmental degradation of Gujarat state; and
- inadequate policies and programmes with regard to provision of drinking water

Another water-related problem plaguing Gujarat is the excessive amount of natural fluoride and high salinity levels found in the available water in many villages More

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[5] Government of Gujarat applies the following criteria to define a no-source village.
- villages not having a public well;
- villages having a public well but the well dries up in the summer;
- villages having water supply source at a distance of more than one kilometre;
- villages where it is not possible to have a simple well;
- villages where a local scheme is implemented but could not be put to use due to lack of funds; and
- villages with public wells within one kilometre which give less than ten litres per head in the summer (Hirway & Patel, 1994: 53).

There is a great deal of controversy over the above definition of a no-source village because it does not take into account seasonal differences or the sustainability of the water supply in the village.

than 2300 villages suffer from excessive fluoride while salinity has affected 1800 villages. The causes of this serious problem can be categorized into four parts:

1 inherent salinity of land and groundwater (natural occurrence of salt in the soil and groundwater due to its geological formation);
2 sea water ingress due to excess pumping out of fresh water from the ground which is close to the sea;
3 human-made salinity due to over irrigation; and
4 deterioration of water quality due to depletion of sources and pollution of water, e.g. in the case of excessive fluoride in the water.

The problem of fluoride and salinity, which is at present identified in sixty-one talukas of fifteen districts in Gujarat, is spreading rapidly across the remainder of the state. The approach to the solution must combine short and long term answers. For these reasons, it is important to understand the nature and root causes of the problems, especially the geo-climatic environmental factors. A brief outline will be drawn from Hirway (1994) in order to point out the main geo-climatic environmental factors that must be addressed when dealing with the salinity problem in Gujarat, particularly in Dhandhuka taluka. This outline will also provide a framework for understanding the limited range of technological options available to address the state's drinking water problem. The six geo-climatic environmental factors are described below:

2.21 Land Salinity and Groundwater Quality

The groundwater is recharged from surface water sources which are already high in salinity. The close proximity to the ocean also results in the groundwater receiving a high percentage of salt. The groundwater table is high and water often escapes allowing the salt to deposit on the surface.

2.22 Flooding and Inundation

The topography of Dhandhuka taluka is very flat increasing the constant threat of flooding or inundation from fresh or sea water. As this excess water evaporates, more salt deposits are left on the soil. Waterlogging is common in areas where the soil contains a high percentage of clay.

2.23 Land Erosion and River Migration

Erosion of the land is rapid and constant, especially because of the strong winds during the summer and the fast flowing water during the monsoon season. Erosion becomes worse as most of the rivers often deviate from their course

2.24 Sedimentation

The mouth of the river is particularly vulnerable to siltation which prevents fresh water from pushing back the sea water.

2.25 *Extreme Climate*

Temperatures vary considerably from very low in the winter season to extremely high during the summer months. The climate also offers the extremes of drought and flood. Monsoon storms and high tides cause sea water to spread extensively over the coastal lowland. These natural conditions have a strong impact on the environment.

2.26 *Evaporation*

The evaporation rate is very high due to the dry climate and heavy wind velocity. It is important to record the evaporation rate on a daily basis in order to plan water harvesting techniques.

The solution in all fluoride and saline affected areas may not necessarily be the same but all solutions essentially have to be based on the principal approach of harvesting fresh water, recharging groundwater, storing water on the surface and sub-surface soils. The most important component to the solution is the involvement of local people in decision-making, implementation, management and maintenance of the systems. This information is not new but ensuring theory is practiced proves to be a challenge. In 1986, several voluntary organizations (i.e. Utthan and Mahiti) started working on this alternative and decentralized approach to rural development. The experiences gained from these efforts are conclusive enough for the state to make important changes in its policies, program approach and execution in order to join the participatory efforts of voluntary organizations and NGOs.

2.3 Government Solutions to Drinking Water Problems in Gujarat State

As the drinking water shortage continued to escalate across the state of Gujarat, the government was forced to focus on this critical environmental issue. In the 1960s, the government of Gujarat began to develop five-year plans in order to address the state's drinking water problem. By 1981, the sixth five-year plan, known as the Regional Water Supply Scheme (RWSS), created the emergence of pipelines across the state. The objective of these pipelines is to provide water to rural villages. However, the problems with this scheme are immense and, as stated by Hirway (1994), include the use of groundwater which is not easy to recharge, high initial costs; reliance on electricity; and dependence on distant authorities.

In Ahmedabad district, there are eleven RWSS schemes and three of these schemes serve the villages of Dhandhuka taluka. The largest of these three schemes, Sabarmati, spreads to about seventy-five villages and is designed to cater to the drinking water needs of 86 000 people. There are a total of eight bore wells at the intake point but only three of these bore wells supply water continuously. Two are used in emergency during the summer while the other three have failed due to the depleting water table and salinization of the water.

At the village level, water tanks are constructed and attached to a standpost. The tank is connected to the pipeline system and then conveyed to the standpost. In almost eighty percent of the villages, water failed to come into these tanks and

hence the people requested underground sumps. These sumps are uncovered leaving them exposed to the elements of nature[6]. The system is also dependent on electricity which is sporadic and unpredictable, leading to a loss of pressure.

Another problem affecting the villages in Dhandhuka taluka is the location of the village in relationship to the pipeline. The villages at the front of the pipeline often have enough water for their domestic and agricultural needs. However, the villages at the end of the pipeline do not have adequate water because there are numerous illegal breakages and faulty pipelines. These structural problems result in leakage which provides even smaller amounts of water for end villages. The high frequency of illegal breakages is difficult to control and impossible to monitor.

Water tankers are a second component of RWSS. This programme is used throughout the year, especially during the summer season and drought periods. However, the sporadic tanker delivery results in increased pressure for the village, especially women, to find water for their daily survival. It is not uncommon to see verbal and physical fighting amongst the villagers when the water tanker arrives. This initiative is a band-aid answer to a serious and complex natural resource management problem in rural villages.

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[6] Refer to Appendix 3.

In 1985, the seventh five-year plan focused on the Rehabilitation of the Regional Water Supply Scheme (RRWSS). RWSS was not working due to technical problems and lack of funds for addressing the limitations within the scheme The government schemes are criticized for being centralized with a huge technical emphasis on infrastructure and technology. Voluntary organizations, on the other hand, believe that these drinking water schemes should address the concerns of people and should be decentralized through community participation and water harvesting techniques. When the government proposed the eighth five-year plan (1990 - 95), the objective was to address water harvesting and conservation methods through community participation. Voluntary organizations were eager to observe and assist this plan into action. Unfortunately, the process is slow and the action phase is still not implemented within the state (Hirway & Patel, 1993: 47)

The government of Gujarat set up the Gujarat Water and Sanitation Supply Board (GWSSB) in response to the growing demand for drinking water in the state. The purpose of GWSSB is to provide water and sanitation to rural and urban areas in the state. While linked to the government, GWSSB is relatively independent which offers more flexibility, especially with regard to policies and procedures (Manikutty and Mavalankar, 1995). Voluntary organizations work with GWSSB in an attempt to promote community participation and women's involvement in alternative water harvesting techniques.

2.4 Summary

The drinking water situation in Gujarat continues to worsen, especially with the increasingly negative impact of the geo-climatic environmental factors. A variety of strategies are required in order to resolve the state's drinking water problems. The government developed five-year plans which focus on top-down approaches to the water situation. These centralized government schemes rely on infrastructure and technology yet clearly have not resolved the drinking water problem in the state. The following chapter reviews traditional and alternative water management systems.

CHAPTER THREE

TRADITIONAL WATER MANAGEMENT SYSTEMS

3.1 Traditional Water Management Systems

The drinking water crisis was not always visible in Gujarat. Traditional water management systems were successfully used for many centuries as a means of providing adequate water supply to rural villages. Over the past fifty years, however, these systems have declined in use and popularity. The reasons for this change include the introduction and use of technology, rapidly deteriorating environmental conditions and the decreasing role of the village community in natural resource management.

Nevertheless, the voluntary organizations, Utthan and Mahiti, believe that these same traditional systems could be part of the answer to Gujarat's water problem, if revived through the help of the people. With the assistance of Utthan and Mahiti and through a community management approach, some villages in Dhandhuka taluka have already improved their traditional water harvesting initiatives.

Three types of traditional water management systems have developed across rural Gujarat. One of these systems uses tankas, also known as kunds, which are:

> "designed to collect rain water and store it for lean periods. The tanka is an underground tank for collection and storage of surface run off from a natural and artificially prepared catchment. When this structure is plastered with

> lime and ash it is known as a kund. The top of these structures are closed except for a small opening to draw water with a rope and bucket" (Hirway and Patel, 1994: 99).

Villages in rural Gujarat do not currently rely on this type of structure for their drinking water.

A second traditional water management system, known as the water conveyance, collects water from rivulets, streams or small falls and stores it in structures. In addition to collecting surface water, these structures recharge groundwater for irrigation and drinking water purposes (Hirway and Patel, 1994: 99).

The most common traditional water management system in rural Gujarat is the talav, also known as a pond or tank[7]. Each village has at least one talav where the rain water collects and is stored in a natural structure for domestic and agricultural needs. Traditionally, each family contributed to the upkeep of the talav, deepening and cleaning it, and upgrading the walls on a regular basis. In some villages, there is a well in the talav which stores drinking water separately. The step well[8] is a similar structure common to Gujarat and Rajasthan. The talavs are still used in rural

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[7] Refer to Appendix 4 and 5.

[8] A step well is a deep well with steps leading to the water. In Rajasthan, villages have altered these systems either by installing hand pumps or using a persian wheel. The purpose of these alterations is to prevent contamination of the water (Venkateswanan, 1992).

Gujarat but the quality of the water is often very poor in areas which suffer from high salinity. Talavs are an integral water source in Dhandhuka taluka

3.2 Dhandhuka taluka

Dholera region is a coastal belt of Dhandhuka taluka which is part of Ahmedabad district in the state of Gujarat[9]. This region comprises a section of the "Bhal" which also covers coastal parts of two other districts, namely Kheda and Bhavnagar, on the coast of the Gulf of Cambay. In the local language of Gujarati, "Bhal" means forehead where nothing grows, a term which aptly describes the extreme conditions of the region.

About 35-40 years ago, the port at Dholera was a centre for trade and commerce For several reasons, the Dholera area has lost its economic strength, resulting in a large migration to other regions of the state. One of the environmental problems which affects migration is the rapid and vast amount of deforestation in the area. Wood is required for fuel and the low lying bushes are used as free grazing for animals, especially camels from Kachch. The environmental conditions continue to deteriorate which add pressure to the natural resources in the area.

In the neighbouring port of Bhavnagar, increased business resulted in a decline in the importance of Dholera as a commercial centre. Its population fell from 40 000

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[9] Refer to Appendix 6.

to less than 5 000. The natural environmental conditions continued to worsen. In 1979 and 1980, about 49 percent of the land, equally 601 736 hectares, in the forty villages of Dholera region was unfit for cultivation. On a village to village basis, this percentage of barren wasteland rose to as high as 91 percent of the total area. Though the mean rainfall is about 500 millimetres, large annual variations in the rainfall result in both drought and floods.

The resource-poor Bhal region faces many development problems including a critical shortage of drinking water, large wasteland areas, poor quality agricultural lands, large scale family migration, an exploitative socio-economic structure, government indifference to the local problems and poor health and education (Wilkinson, 1990).

With eighty percent migration, only elders and children remain in the villages of the Bhal. Initially, Mahiti members, primarily men, showed enthusiasm towards improving their environment. Over a period of time, and as the work of the organization grew, women's issues and groups began to emerge as a distinct focus. The groups clearly identified the need to have a woman leader as well as more women in the group. Women's major roles in the interventions and activities of the communities have demonstrated that sustainable development is possible only through their active involvement.

3.3 Main Solution in the Village: Rain Water Harvesting Initiatives

Unreliable water supply forces the village to resort to various coping methods Villagers sleep around the water tank because the water could come at any time during the day or night. Children (mostly girls) must jump into the sumps to retrieve water because the water does not reach the top of the tank (refer to Appendix 3) Some villagers dig "viradas" pits in the dry talavs to get small amounts of muddy water; these pits are then heavily guarded by family members. Other villagers walk or use carts to collect water about eight to ten kilometres away from their home.

The extreme efforts needed to collect drinking water put a strain on individuals, families and communities. In 1984, the people from the villages in Dhandhuka taluka suggested to Utthan the idea of harvesting rainwater in surface ponds. The talav in each village collects and stores rainwater during the four-month monsoon season. However, in order for the water to remain potable, it must be protected from the saline soil and the shallow groundwater.[10] To achieve this, the surface ponds are lined with thick plastic sheets to prevent further salinization and the stored water is then tapped through a handpump after it has passed through a slow sand filter outside the tank[11].

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[10] Water from the groundwater table has a salinity level of 50 000 ppm while sea water only contains 35 000 ppm of salinity (Tushar, 1994).

[11] Refer to Appendix 11.

The lined pond project underwent many difficulties due to opposition from the government and corrupt individuals within the communities. The initiative became a women's programme because women played an important role during the various phases of the project and supported its successful implementation. Despite the initial management obstacles, twenty lined ponds were completed in Dhandhuka taluka.[12]

Initial acceptance of the lined pond technology by government authorities was one of the obstacles faced by the villages and voluntary organizations. (Refer to Appendix 9) Early on, the government resisted the initiative as a proven alternative rainwater harvesting technique, arguing that the lined pond was not in the approved technology list provided by the Gujarat Water Supply and Sanitation Board (GWSSB). Consequently, the organizations struggled to demonstrate the efficacy of the approach and to have the lined ponds accepted by the policy-makers who ultimately allocated the financial assistance (Barot, 1992). The lined pond construction costs about Rs 34[13] per cubic metre of storage. The estimated capital cost per litre of water, with depreciation over fifteen years, is just Rs 0.19 - 0.24. The first eight ponds cost Rs 36.5 lakhs. (Refer to Appendix 7 and 10)

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[12] Refer to Appendix 8.

[13] One rupee is equivalent to about 23 Canadian dollars (1995).

3.4 Objectives

Drawing on lessons learned from previous community-based management systems, it is observed that an organization at the village level must be responsible for maintaining and managing the lined ponds. Village level water committees are identified as a tool by which a group of people from the community (men and women) can take responsibility for the lined pond.[14]

The drinking water initiative in Dhandhuka taluka is facilitated by Utthan and Mahiti. This community development programme incorporates four objectives which are outlined below.

Overall Community Understanding

Awareness-raising is an important component of this initiative because it ensures the village has a clear understanding of this drinking water alternative, as well as its viability, implementation, funding and maintenance.

Adoption and Internalization

The second objective of this programme is to ensure that the people in the village understand the responsibility of maintaining and managing the drinking water system.

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[14] Water committees are discussed in Chapter Six.

Participation of the Community with the Main Focus on Women

The third objective of the programme is to ensure that the community, especially women, have input into decision-making, site selection, technical and non-technical skills building as well as the general planning of the work schedule and the division of responsibilities. Village involvement is important for the physical implementation and the future maintenance of this drinking water alternative.

Community Management

The main objective of the intervention is to involve the community in developing and managing appropriately all the water resources available at the local level. A systematic local support system will be developed in order to manage the village drinking water systems. An awareness programme facilitated through the voluntary organizations will assist the community structures to address the drinking water issues with the village.

3.5 Summary

Villages in rural Gujarat have developed water management systems for their people. Utthan's research recommends an integrated approach and the development of water resource management at the local level as opposed to a centralized control of the systems. The lined pond is an alternative water harvesting technique which prevents salinity seepage into the water. This initiative was developed by the people from Dhandhuka taluka and implemented with the assistance and facilitation of two voluntary organizations, Utthan and Mahiti. The

next chapter summarizes the history and initiatives of these two voluntary organizations.

CHAPTER FOUR

APPROACH OF UTTHAN AND MAHITI TO THE PROBLEM[15]

4.1 History

In 1979, the Gujarat government wanted to involve nongovernmental organizations (NGOs) in the planning process of Dhandhuka taluka in Ahmedabad district[16]. A Block Level Plan for this coastal region was proposed and submitted by a team of professionals known as the Ahmedabad Study Action Group (ASAG). However, the government did little to implement this plan. After submission of the plan, members of ASAG were eager to work with the people in this area on development initiatives. They realized the people needed to explore the potential natural and human resources available. They also knew the villagers were aware of these resources but were unable to connect and make linkages with the information in order to initiate development plans. ASAG believed that, if these two aspects were bridged, the villages could work toward their own development.

In 1981, four members of ASAG set up an organization in order to stimulate development action. Under the legal entity of Utthan Trust, a process of building a local team in Dhandhuka taluka was initiated known as the Mahiti team. Mahiti was initiated to foster the evolution of information and to make linkages between the

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[15] The information in this section is compiled from O'Hearn (1995).

[16] Refer to Appendix 6.

people and government. The team believes that community knowledge leads to awareness and, consequently, leads to self-sustained development, action and empowerment.

Utthan, the "outsider group," provides a support structure and consists of the founders who prepared the Block Level Plan, some dedicated professionals and occasional associates. Mahiti is the primary action group and, initially, it consisted of a group of "insiders" from the villages who actively participated in the Block Level Plan as well as local individuals, especially women.

Utthan's role includes the promotion of information exchange, increasing people's awareness of government programmes, and training and supporting the Mahiti team so they can ultimately take responsibility for the development of the area in an effective and sustainable manner. In this process of initiating and supporting the efforts of Mahiti as well as promoting a self-sustainable process of development, Utthan also developed its own group of development workers.

4.2 Utthan Trust[17]

Over the past three years, the Utthan team has expanded their work into other geographic areas of Gujarat. They continue to approach development with the same belief, which support the following tenets:

- of all people, local people are best suited to contribute towards the improvement and development of local resources;
- local youth, men and women care for and want to improve their villages;
- there is an increasing need to simplify techno-professional knowledge and make it accessible to the local community-based groups;
- there is a need to understand and learn from the local traditions of doing and knowing; and
- it is possible to adopt and adapt modern technological development to solve specific problems of natural resource management on a local scale.

After reviewing their previous experiences with Mahiti in Dhandhuka taluka, Utthan divided their activities into three teams: Tribal Area Development, Coastal Area Development and Centre for Drinking Water Resource Management[18]. Each team is described in the following section.

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[17] Refer to Appendix 12.

[18] I worked with the Centre for Drinking Water Resource Management (CDWRM) team.

4.21 Tribal Area Development

In 1993, Utthan began to visit the Panchmahal district of Gujarat. The problems faced by this "tribal"[19] region include the depletion of natural resources, poor transfer of technology to the "tribals," low educational standards, poor health facilities and highly exploitative developmental administrations. In 1994, the Utthan team (known as Tribal Area Development or TAD) began their work in the Limkheda taluka of Panchmahal district.

4.22 Coastal Area Development

Natural resources in the coastal area of Gujarat are deteriorating rapidly. The thick forest of mangroves and piloo have disappeared, leading to soil erosion and other environmental degradation. In response to the growing problems, Utthan organized the Coastal Area Development (CAD) team. CAD will identify the most critical areas on the coast where degradation of natural resources occurs and then develop action plans with the people.

4.23 Centre For Drinking Water Resource Management (CDWRM)

The centre strengthens and supports NGO agencies and local groups by learning and working on continuous initiatives and programmes. The ultimate goal is to develop local resource groups which ensure community participation, especially

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[19] The term "tribal" refers to the indigenous people in India.

women's involvement. The centre offers help and support in improving capacity, skills and knowledge through interactions, exchanges, exposure visits, demonstrations, experiments and workshops These efforts enable local communities and voluntary groups to work with the local people in improving their own environment through water resource management. The major focus of efforts involves women in all aspects including decision-making as well as technical and non-technical skills building. Experience shows that this focus empowers women and allows them to play a dynamic leading role in challenging and affecting changes in government policies and in the implementation mechanism.

This centre also promotes a technical effort to recharge the groundwater and conserve water through alternative methods. This approach develops the water source and focuses on equitable distribution systems which allow access to water for basic needs. The centre believes that both women and men can manage and maintain natural resources. The appropriate alternatives may effectively prevent the "drying up" of water resources in the future. Low income and disadvantaged communities will be equipped with necessary resources to overcome the physical, social and economic constraints facing them due to the inadequate and unsustainable supply of drinking water.

The immediate advantage of having the centre as an active participant is the alleviation of acute drinking water shortage. In the long term, however, the villagers will realize they can effectively organize themselves to better their living conditions.

CDWRM incorporates these short and long term advantages by focusing on five central areas;

1. evaluation of the drinking water scene in different regions of Gujarat,
2. examination of the genesis of the problem while critically examining government policies and programmes on drinking water;
3. finding relevant, decentralized, traditional water management systems through the assistance of active people participation (there is an opportunity for women to take part in the decision-making process and various aspects of developing and managing their drinking water resources and systems);
4. supporting local level groups, especially women, through their drinking water crisis; and
5. developing policy on drinking water and decentralizing management so as to optimize the use of water resources with the least environmental and economic costs, through active participation and involvement of women and communities

4.3 Mahiti

In 1994, Mahiti became an independent and registered organization. Mahiti still works closely with Utthan, especially with CDWRM and the Documentation and Communication Unit. At the same time, Mahiti is increasing its capacity to work in more villages within the Bhal region. Mahiti is supporting the women's groups of the Bhal who are planning to form an Area Network. Mahiti and the women's groups initiate Area Resource Groups (ARG) which include area individuals who are interested in biogas, sanitation, health training, nonformal education, land issues

and social afforestation. ARGs support this network and other community groups who address various technical and non-technical issues. Team members are supported and trained to address community issues. They will initially be supported by Mahiti but will later function independently.

The ARG plays an important role in the sustainability of any programme because they are accountable to communities, especially women. It is envisaged that, for implementation of any project at the community level, the funds will be raised by the groups and individuals assisted by the ARG.

One of the initiatives undertaken by Mahiti and Utthan was the acquisition of twenty hectares of government wasteland in Dhandhuka taluka which was used as a site for the People's Learning Centre. The two main purposes of this centre are to demonstrate scientific experimentation and to provide a base for people to meet. The centre continues to explore experimental techniques in farming (i.e. social afforestation), rain water harvesting approaches (i.e. roof water collection and ponds), drinking water alternatives (i.e. reverse osmosis and solar distillation) and prawn cultivation. A meeting place for people in the area, the centre has a hall, office, kitchen and washroom facilities as well as accommodations for the Mahiti team and visitors. The centre allows for people to come together in order to exchange information and participate in workshops, meetings and seminars.

4.4 Definitions within Community Development

4.41 Community versus Village

It would be misleading and unrealistic to portray a village as one unit with the same objectives and goals towards community development. In reality, villages are divided into many communities for reasons of caste, class, gender, family ties, power and politics. Each community member sees the village in a different way It is the role of the voluntary organization's community organizers to bring these diverse communities together. Once communities begin to realize the importance of working together, the collective strength and awareness helps them to work towards village improvements.

4.42 Community Participation

Community participation is a process by which people control or influence decisions that affect them (Manikutty & Mavalankar, 1995). This definition reflects Utthan and Mahiti's view of participation while working in the Bhal region of Gujarat.

When Utthan began to work in the Dhandhuka taluka of Gujarat State, they understood community participation to encompass attendance of community meetings and discussion regarding local issues and problems on the part of the villagers. The voluntary organization soon learned that their understanding of community participation did not match that of the villagers. The villagers believe an individual is informally selected by the community to be the leader and

spokesperson during a meeting with the outsiders. This person may control a large part of the formal discussion during a meeting, but if the community does not agree with the leader, they voice their opinions and concern. Alternatively, the villagers may act according to their beliefs and this action could appear to be the opposite of what the "leader" stated in the group meeting. The group action prevents the informal leader from taking advantage of the opportunity to acquire personal gain or benefit.

Understanding, this difference of opinion between Utthan and the community is important in gaining an awareness of the community and/or village. The substance of community development comes from this voluntary organization's community organizer. The work in the village depends on this person's level of understanding of the issues and his or her facilitation skills. When the community organizer develops a level of trust within the village, the meetings and discussions become more "participatory." For this reason, it is important for the voluntary organizations to take the time to build a relationship within the village.

4.43 Consciousness-raising

In Pedagogy of the Oppressed, Paulo Freire developed the concept of *conscientization* or consciousness-raising. *Conscientization* is reached when people comprehend the structure of oppression and also become aware of their role within the transformation of their situation (Freire, 1972). In this research, consciousness-raising is viewed as awareness and is an integral component of the voluntary

organization's work.

Utthan's team facilitates the exchange of information in order to raise awareness within the community, especially women's organization and mobilization. They believe that awareness leads to action which in turn promotes change. Popular education also addresses the need to strengthen a group of people through consciousness-raising and awareness. This theory recognizes that oppressed people are not necessarily aware of their oppression. The popular education process allows people to name their own realities, analyze the structures which oppress them and act to transform them. Innovative approaches and techniques, including the use of traditional knowledge are used to raise consciousness.

Although this practicum does not deal directly with popular education, it is an underlying tool used by the voluntary organization's community organizers to ensure consciousness-raising, participation and empowerment within the community development initiative. For example, an awareness programme was organized by CDWRM, Utthan's Documentation and Communication Unit and Mahiti for the nineteen villages with lined ponds in Dhandhuka taluka. The objective of this programme is to raise village awareness about the proper management of drinking water systems; to provide a platform for the village to discuss problems, and to introduce the role of the water committees. A variety of tools are used to meet these objectives including drama, photos, facilitated discussions, songs, videos and charts.

4.44 Empowerment

Enabling is the first phase of the empowerment process (Wilkinson, 1990). Enabling "involves organizing people into a collective group and supporting and equipping them to better meet their daily needs and struggles" (Young, 1988: 9). In the Bhal, people work individually without a focus or an understanding of the complexity of the problems within their village. However, as the people begin to organize into village groups, they are able to collectively address some of their problems. Utthan assists the rural villages in the Bhal to organize, build local leadership and develop strategies to confront their social problems.

"Empowerment seeks to combine both consciousness-raising and participation so that individuals not only understand their society and the place they currently have in it, but that they undertake efforts to modify social relations" (Stromquist, 1988: 12) The Utthan and Mahiti teams believe that empowerment is a process which takes time, patience and facilitation. It is connected and entwined with consciousness-raising, participation and the management of change.

Utthan's development process incorporates the three components of empowerment which Stromquist (1988) views as difficult for women to achieve at one time. She describes these components in the following way:

> "The cognitive component refers to women's understanding of their conditions of subordination and the reasons creating such conditions. The psychological component includes the development of feelings so

> that women can improve their condition The economics of empowerment signifies that women must be able to engage in a productive activity that allows them some degree of financial independence" (Stromquist, 1988, p. 13).

Utthan's work places a special emphasis on enabling and empowering women Through the assistance of Utthan and Mahiti, the women in the Bhal have organized into village groups called Mahila Mandals which help women to address their concerns about the village's social problems, their relationship to the problems and the potential solutions. In this way, women begin to learn and understand the complexity of the issues fulfilling the cognitive component of empowerment.

It is important for women and men in the villages to comprehend the complexity of oppression in order to challenge the power structures. Through the Mahila Mandals, women support each other during family conflicts and sickness Women feel strongly that it is important to receive training in health to help their family and village. While these women attend workshops, other mandal members take over their household responsibilities in order to prevent conflict within the home Women learn to feel positive about themselves and their work. The psychological aspect of empowerment can be fulfilled in many avenues once women become aware of their daily environment and situation.

The economic component is addressed because these Mahila Mandals are also savings and credit groups which offer women financial independence from the

moneylenders and their husbands. Some of the Mahila Mandals are also engaged in income generating activities, i.e. seed marketing.

'Empowerment is the process in which people assume an increased involvement in defining and promoting their own agenda for political and social projects designed to enact change' (Young, 1988: 9). Utthan and Mahiti firmly believe that empowerment of women and the village is a time consuming process and they will go through various positive and negative changes during this process.

4.5 Summary

Two Gujarati voluntary organizations, Utthan and Mahiti, believe that knowledge leads to awareness which, in turn, leads to self-sustained development, action and empowerment. Both organizations focus their initiatives on natural resource management issues within a community development framework in rural Gujarat. Over the past four years, Utthan and Mahiti have expanded their work while following the philosophy that local people are best suited to contribute towards the improvement and development of local resources. The next chapter reviews the research methodology incorporated in this report.

CHAPTER FIVE

METHODOLOGY

5.1 Design

The research approach used throughout this practicum incorporates techniques from the traditional and the alternative research paradigms.[20] Shook (1993) argues that research is not purely participatory or positivist but it is a mixture of various methodologies. Another important component within research is the combination of different indicators by using an alternative triangulation approach (e.g. Reinharz 1992; Beck 1994). With these assumptions in mind, a triangulation approach is utilized in order to address all the issues in this research project.

The research approach used in this practicum incorporates various indicators and methodologies. The research can be divided into two components; primary and secondary data collection. Each component is explained in further detail below.

Secondary Data Collection through Document Analysis

I reviewed and analyzed the internal documents and reports from Utthan and Mahiti to gain an understanding of their mandate, philosophy, objectives, programmes,

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[20] Refer to Appendix 13.

history, achievements and their future direction. This process began in September 1994 and continued throughout my field placement.

I collected and reviewed documents (i.e. books, journals, periodicals, magazines and newspapers) which focus on natural resource management, gender and development, and drinking water issues in Gujarat, India and globally. The document analysis was a continuous component of research in India and Canada.

Primary Data Collection through Field Research

Field research includes primary data collected through meetings with the Utthan and Mahiti teams as well as participant observation and interviews (informal and formal).

Meetings were held with the Utthan and Mahiti teams at intervals throughout my field placement in India. The initial purpose of these meetings was to fill in the gaps left out by the document analysis. The senior staff members were fundamental in the development of frameworks and critical assumptions and they also translated, interpreted and assisted in the preliminary analysis of the information.

Participant observation was the main tool used to conduct the field research. I recorded observations during projects meetings and field trips to the rural areas. I met with village men and women as well as groups such as the Mahila Mandals. I also attended various workshops and conferences in Dhandhuka taluka, Ahmedabad, Delhi and Bangalore. Since language is a barrier and simultaneous

translation is not always possible, I rely on observations as well as the summaries and translations from the staff.[21]

5.2 Research History

I was a participant in the International Development Management (IDM) Programme through the Aga Khan Foundation Canada (AKFC). In July 1994, the IDM programme began with a one month seminar focusing on the conceptual issues of strategic planning, organizational and programme management as well as the practical skills related to human resource and financial management. The second component of the IDM programme includes an overseas placement with a local development organization in South Asia. In August 1994, I began a six month training placement with Utthan and Mahiti, two local organizations in India.[22]

My responsibilities during this six month placement included assisting the Utthan team in writing funding reports and six monthly reports; preparing a brochure on the organization; writing a manual (entitled Utthan and Mahiti: Who are We?) which outlined the organizations activities over the past ten years; and researching the role of community organizers.

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[21] Refer to 5.4.

[22] Information on Utthan and Mahiti is provided in Chapter Four.

A three month extension until June 1995 (total of nine months) allowed me to document Utthan's and Mahiti's drinking water activities with an emphasis on women's management of these systems. The research is based on my experience and the need defined by the voluntary organizations.

From September 1994 to February 1995, I made numerous field visits with the community organizers to the rural villages. These visits provided me with a better understanding of Utthan's and Mahiti's work in the past, present and future. They are both expanding into new areas, geographically and sectorally, so it is a very dynamic and exciting time to work with them.

I attended Mahila Mandal meetings, made regular day visits with community organizers to villages, participated in workshops on health and nonformal education, and joined the team during monitoring sessions of the water committees, handpumps and lined ponds. As a result of these encounters, I became familiar with the villages, people and cultures in Dhandhuka taluka.

5.3 Village Selection

Villages were chosen through the assistance and guidance of Utthan's Executive Trustee, Mahiti's Leader, CDWRM and the team members of Utthan and Mahiti. Since there are twenty lined ponds in nineteen villages in the Dhandhuka taluka,[23]

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[23] Refer to Appendix 8.

it was decided that I would visit five. The villages in Dhandhuka taluka share common geo-climatic environmental conditions as well as locally managed and decentralized systems, especially water systems. The village selection is based on the following criteria[24]:

Construction Time

In 1987 and 1988, seven villages in Dhandhuka taluka wrote proposals to receive funding in order to have a lined pond constructed in their village. A total of eight ponds were constructed in this time period. In 1992, twelve villages requested the assistance of Utthan and Mahiti to deal with their serious drinking water problem For the present research, the Utthan and Mahiti teams feel that it is important to study two villages from the first construction phase in 1987 and another two from the later phase in 1992.

Management of Lined Ponds

According to Mahiti, some villages are not managing their drinking water systems properly. In many of these villages, people misuse the source (i.e. washing clothes, cleaning dishes and vessels, bathing or washing cattle) or in other cases, the lined ponds are ignored by the village. This factor is viewed as an integral part of the research. Through the assistance of the community organizers, villages were selected based on their management of the community drinking water systems

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[24] Refer to Appendix 14.

Two villages who were unable to manage their ponds and two villages who manage their systems were chosen by the Utthan and Mahiti teams.

Voluntary Organization's Relationship with Village

Even though there are nineteen villages with lined ponds, Mahiti is no longer working in all of them. Due to the time constraints and language barrier, the research team decided to study villages where Mahiti community organizers work on a regular basis.

Water Committees

Water committees are organized in each village in order to assist in the maintenance and the management of the drinking water systems. Some of these committees are still in the beginning phases and are experiencing some difficulties. Four villages were selected based on the status of the water committee (two villages with functional water committees and two villages facing problems with their water committee).

Documentation

Over the years, Mahiti and Utthan have documented various initiatives which include some of the villages in the Dhandhuka taluka. My research is providing information on villages which have limited documentation.

Special Case of the Village of Mingalpur

The village of Mingalpur is one of the first villages to have a lined pond. The Utthan and Mahiti teams believe that the work of the Mahila Mandal in Mingalpur impacts other villages in the area.

Four villages were chosen solely by Utthan and Mahiti as the researcher did not know the history or present status of each village. There was continuous monitoring by the voluntary organizations and the researcher during the information collection and preliminary analysis. This monitoring resulted in revisions to the village list. For example, Hebatpur was selected but Mahiti and CDWRM are experiencing problems within this village. The lined pond is not completed and people are not co-operative or working together. It is believed that the research team will not receive proper information or be welcome in the village until the situation is resolved. In the meantime, an alternative village with matching criteria was selected by the team.

5.4 Challenges to Data Collection

There were several challenges to the data collection that relate to language, time and my role as a researcher. A brief explanation of the challenges follows:

Language

The main barrier throughout the field work was language. In Gujarat, people speak Hindi and/or Gujarati. The rural areas have very distinct dialects of Gujarati. I took formal language classes for several weeks and continued an informal learning

process with co-workers. After nine months, I was capable of having a rudimentary conversation.

Time

The field research was conducted over a nine month period which crosses the end of monsoon, winter and summer seasons in Gujarat. The final three months of data collection were integral yet they occurred during the summer months when the temperature reaches an unbearable 50 degrees Celsius. Villagers slow down with the intense heat and it is a busy time with preparations for the upcoming monsoon. Moreover, the wedding season also falls at this time which makes it difficult to arrange and organize meetings.

Researcher's Role

My role as a researcher is not to conduct an evaluation of the projects but rather to observe and document the social processes involved in establishing the drinking water alternatives in the villages over the years. Through this documentation process, there will be a platform for the Utthan and Mahiti team members to review, evaluate and re-formulate some of their ideas with the communities.

5.5 Summary

A nine month research project which examined five villages with lined ponds in Dhandhuka taluka was conducted with two voluntary organizations. The community development approach followed by these two organizations was documented after careful observation and informal interviews. The following chapter analyses the information using a comparative framework.

CHAPTER SIX

COMPARATIVE ANALYSIS

6.1 Comparative Analysis

Five villages in Dhandhuka taluka of Gujarat State were selected for a research project in consultation with the Utthan and Mahiti teams. The information collected during nine months of field research was compiled and is analyzed through a comparative analysis framework. The theoretical framework developed by George Z.F. Bereday is integrated into the research. Bereday divides comparative analysis into four steps: the "descriptive" phase refers to the documentation of the research into categories; the second step is the "interpretative" component which incorporates social sciences into an analysis of the descriptive information; and the third step is "juxtaposition" which begins to combine the information in an attempt to "focus on the common comparative framework in which analysis can be made" (Bereday, 1964: 42). The development hypothesis is formulated during this step. The fourth and final phase in this framework is "comparison" which combines the individual reports into one analysis while making conclusions regarding the development hypothesis.

6.2 Descriptive Phase

According to Bereday's framework, the comparative analysis begins with the descriptive phase which refers to the "cataloguing of purely pedagogical details"

(Bereday, 1964: 30). The research data is arranged into categories for each village. This descriptive phase is divided into eight categories: migration; resource mobilization (human, financial and other initiatives); villages relationship to the community organizers and voluntary organizations; women's involvement (gender relations); interrelationship; community dynamics; water situation; and the community development process. A general description of each category follows.[25]

Migration

Many people and families in the Bhal are forced to leave to search for employment in other parts of the state. The summer months are the most challenging due to the lack of water for them and their cattle. Migration plays an important role in a community development initiative. Migration reduces village populations and diminishes the people's strong commitment to their village. When these migrants are not permanent residents, they do not understand the problems within the communities. Furthermore, sustainability of an initiative becomes difficult when the population is constantly changing. Even community leaders are forced to leave for several months, impacting the village and community groups.

Resource Mobilization

This category is divided into three sections: human, financial and other initiatives. Human resources focuses on the organization of women and men in the village as

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[25] Refer to Appendix 15 for a full description of the categories in relationship to the five villages.

well as their participation levels, awareness and attitudes. Financial resources examines the village's access to funding sources. It is also important to be aware of women's access to finances and credit and the moneylender's power within the village. Other initiatives refers to other development projects and initiatives in the village and/or area which developed due to the drinking water initiatives. One example is the community health programme defined by the villages to complement and support the drinking water initiatives.

Villages Relationship to Community Organizer and Voluntary Organizations

This category examines the village's relationship with external change agents, i.e. community organizers and voluntary organizations. Some of the questions raised include: Do the voluntary organizations, Utthan and Mahiti, work in this village on a regular basis? When did they start to work in this village? Who do they work with? Is there a positive working relationship between the village and the organizations?

Women's Involvement (Gender Relations)

This category explores the Gender and Development framework which is designed to empower women and improve their position in society relative to men. Some of the issues addressed include: women's involvement within the various processes of community development; gender relations; participation within group activities; formation of groups and their sustainability.

Interrelationship

The relationship between each village is an important consideration in a rural area, especially in Dhandhuka taluka where there are similar geo-climatic, environmental and social problems. This category reviews the correlation between each village, the mandals and other development organizations. The positive and negative issues are outlined and later analyzed.

Community Dynamics

This category explores the relationship between the community and village and investigates how the internal community dynamics may impact on development initiatives. The way in which the community works to solve social and environmental problems is an important component of this category.

Water Situation

Because of the changing seasons, it is important to understand the need for water initiatives in the village.

Community Development Process

This category reviews the development process followed by the voluntary organizations and the community organizers during the lined pond initiative. This process outlines various phases of a community development programme, including needs assessment, implementation, monitoring, training and the awareness programme.

6.21 Villages in Dhandhuka Taluka

Utthan and Mahiti work in Dhandhuka taluka focusing on natural resource management issues in rural villages through a participatory development approach. The drinking water problem is continuously worsening in this taluka as well as across the entire state of Gujarat. Government initiatives have not alleviated the problem but have made the villages reliant on technology and centralized systems.

Nineteen villages in this area decided to address their drinking water problems by improving their traditional water harvesting systems through a participatory approach and with the assistance of Utthan and Mahiti. These villages constructed lined ponds to harvest rainwater and confront the salinity problem in their area.

Each of the five villages selected is unique and has its own special characteristics. A brief summary of the five villages is provided in order to give the reader a glimpse into these dynamics.

6.211 Rajpur

The village of Rajpur is located close to the villages of Rahatalav[26], Mingalpur[27] and Bavalyira[28]. Rajpur has no electricity, water or roads but must rely on Mingalpur for provisions and to employ a few of their young boys in the diamond polishing business. Due to the extreme environmental conditions and inadequate infrastructure, young and old must move to other areas in search of employment. There are about eighty to a hundred households, less than forty are occupied.

The water situation in Rajpur intensifies as summer approaches. Until 1987, the only water sources were the talav (which was dry five to six months of the year) and the government pipelines. Rajpur is at the end of the government pipeline scheme which means a limited availability of water (i.e. thirty minutes per week). People were forced to walk ten to fifteen kilometres a day in order to collect water for basic survival. Women are responsible for water collection[29] but men assist if they have access to a bullock cart.

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[26] In 1985, the first lined pond was constructed in Rahatalav. This experimental process raised awareness of the community's power to address their natural resource management problems.

[27] The village of Mingalpur is discussed in 6.215.

[28] The village of Bavalyira is predominantly a darbar community. These darbars verbally and physically pressured the people in Rajpur in an attempt to prevent the Rajpur women from organizing and talking to government and nongovernmental organizations about their severe social and environmental situation.

[29] Refer to Appendix 16.

In 1986, the women formed a Mahila Mandal in order to collectively address the problems in their village[30]. They received advice and support from the Mingalpur Mahila Mandal before they approached Mahiti for assistance with their water crisis. (Refer to Appendix 2) In 1987, a lined pond was constructed by the village with the assistance of Utthan and Mahiti. The pond has reduced stress and labour for the village throughout the year, especially the summer season. The community-based organizations take responsibility for its maintenance, monitoring and management. Unless the villagers abide by the rules and regulations for all the water systems, they will be fined.

Once the lined pond was constructed, Mahiti suggested that the women increase their activities into a savings and credit group. The difference of opinion which resulted spurred some women to resign from the mandal, though they still support the mandal's activities. The mandal is registered and receives loans from FWWB[31].

The women of Rajpur are very outspoken and eager to stand up and fight for the rights of their village. Their work and determination is recognized in the taluka as they share their experiences with other women and men involved with the Area Resource Group. They are also assisting the women from Bavalyira form their own mandal.

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[30] Refer to Appendix 2.

[31] In 1982, Friends of Women's World Bank (India) was founded as a support network for women who possess entrepreneurial qualities but lack the capital, management skills and confidence to start a viable business. FWWB (India) has an office in Ahmedabad, Gujarat.

6.212 Anandpura

Anandpura has a population of about 1000 with seasonal migration. The Sarpanch is shared with the neighbouring village and the darbars have a strong influence here

Anandpura is informally divided into at least three groups who constantly quarrel with each other, making community organizing very difficult. A Mahila Mandal was organized for about one year but it disbanded partially as a result of the increasing social conflicts. Superstition and mistrust are only two of the underlying problems which need to be resolved by the communities.

There are three water sources in the village: talav, pipeline and the lined pond. Two months following the monsoon rains, the water in the talav can only be used for washing because it becomes too saline. The government pipeline provides sporadic amounts of water for very short intervals. In 1992, a lined pond was constructed with the assistance of Utthan, Mahiti and CDWRM. The site selection for the lined pond was difficult because there were very few options and little available land. Ultimately, the pond was constructed across the road from the village and on the other side of a farmer's field. The distance and location of the pond make accessibility difficult. Though, the village planned to build a pipeline from the lined pond to the village, they were unable to organize and raise funds for this pipeline

In 1995, a water committee was organized to participate in handpump training sessions as well as to manage, maintain and monitor the lined pond and the other drinking water systems in the village. This water committee is predominantly male and some of these men claim they never visited the lined pond. One female joined the water committee because she wants to help resolve the issue: "many problems in the village over water and the community is not working together to solve these problems."

In April 1995, the water committee attended an Area Resource Group (ARG) meeting which raised their awareness to women's needs, village problems and their role in mediating and resolving the problems. Anandpura's water committee will receive positive benefits through the support and guidance from other villages who have lined ponds and belong to the ARG.

Mahiti has five community organizers who work in about thirty villages in Dhandhuka taluka and Bhavnagar district[32]. A community organizer is responsible for Anandpura but this individual feels uncomfortable and overwhelmed by the community conflicts and is unable to work here on a regular basis. The many social problems in this village require a skilled facilitator.

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[32] Bhavnagar is one of Mahiti's new working areas. Bhavnagar district neighbours Ahmedabad district in Gujarat State. Dhandhuka taluka is located in Ahmedabad district.

CDWRM continues to work on handpump training and an awareness programme in Anandpura with the water committee. CDWRM's chief engineer, a male, has developed a strong and positive relationship with the water committee. The water committee respects CDWRM's engineer which shows that a male and female team could work in this village to assist in the facilitation of community development initiatives.

6.213 Kamatalav

Kamatalav has a population of about 1200 with seasonal migration. There are some families have returned to Kamatalav with their diamond polishing equipment[33]. The Sarpanch who lives in the village, takes his responsibilities very seriously and is very supportive of community development in Kamatalav.

Water availability is limited, especially during the summer months. The two village talavs are almost empty in February[34] while the remaining water is saline and nonpotable. Water from the government pipeline comes on a regular basis until the summer season. In 1993, a lined pond was constructed through the assistance of

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[33] Many people, especially young boys, migrate to south Gujarat and other cities in the state in order to make money in the diamond polishing industry. Special equipment is required to conduct this job. Most people remain in factories in the city although there is a growing number of individuals who are purchasing their own equipment in order to return to their villages.

[34] Rain water is naturally collected in the talavs during the monsoon season from June to September. This is the only rainfall in Dhandhuka taluka throughout the year. If there is no water in the talav in February, the village will have to wait until the monsoon arrives four to five months later. The villages in Dhandhuka taluka always fear a drought or a low amount of rainfall during the monsoon.

Utthan and Mahiti. The village debated and discussed the potential choices available for the lined pond site. The final location was selected based on two factors determined by the village and the voluntary organizations. First, it was convenient for people who were going to their farms as they would pass by this site and be able to collect water. Secondly, this site matched technical surveys which show the possibility of diverting some water from the talav into this catchment site.

In 1992, some of the women began to organize in Kamatalav. They formed a Mahila Mandal which focused on savings and credit and was a key player in the lined pond process. They now participate in income generating activities (i.e. seed marketing) through the assistance of loans from the FWWB. An active health worker in the village was trained by Mahiti.

Gauribahen is the wife of the present Sarpanch. She is one of the leading members in the Mahila Mandal as well as the village health worker. She represents Kamatalav's Mahila Mandal when she goes to Ahmedabad once a month with Mahiti and several other women from the area. They meet with government officials and FWWB staff regarding funding for their community development initiatives and receive the necessary support, advice and guidance from Mahiti staff and community organizers. Gauribahen also attends meetings and workshops at Mahiti centre. Mahiti's community organizer is very busy orienting new staff and she is also pregnant with her first child. She was worried that she would be unable to assist Kamatalav's mandal with their seed marketing activities. Gauribahen

responded to her concern with "Don't worry, I'll take care of that for you. After all, it is our mandal and our village." This response is indicative of the attitude towards the community development initiatives in their village. The initiatives are not the responsibility of Mahiti or Utthan but the women and men of Kamatalav

6.214 Navagam Karna

Navagam Karna has a population of about 800. The Sarpanch resides in this village but he does not support the Mahila Mandal or the lined pond initiative. Migration is seasonal and boys go to the city for eight months of the year in search of employment. The village of Pipli is about five kilometres away and it is home to the darbars who regularly visit Navagam Karna to pressure, threaten and ensure control and fear with the families who owe them money.

There are several water sources including the talav, step well, government pipeline and lined pond. The village talav was repaired about fifteen years ago through a government project. The repairs included the construction of steps, strengthening the sides and digging the pond deeper. The step well[35] about two kilometres outside the village is used by Karna and other villages during the summer months. There is always water in this step well and it is treated with respect as it holds precious

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[35] Step wells, traditional structures to Gujarat and Rajasthan, has a series of steps which lead to a lower platform. The step well in Navagam Karna is located in a traditional talav or pond. Though the pond is empty, the step well remains filled with water. There is a temple for worship attached to the step well and trees surrounding it (trees are not common in Dhandhuka taluka). The voluntary organizations worked in this village since 1991 but they just learned about the step well in 1995!

water during the summer season. The government pipeline is not a reliable source of water.

In 1992, Utthan and Mahiti helped the people of Karna build a lined pond in their village. There were problems in selecting the site, finding adequate numbers of workers plus a number of internal village problems. The solution for employment involved hiring a tractor instead of human labour to do some of the digging. Time constraints placed a limitation on the construction of the pond.

In 1992, the women formed a mandal in order to address their credit problems. Having heard about other villages where women organized into groups Karna was able to begin a woman's savings and credit group, through the assistance and support of Mahiti and Utthan. This group also played a strong role in the lined pond construction and its management. In 1995, the mandal decided on their future direction; some members would like to develop an income generating programme focusing on seed marketing.

The water committee in this village is comprised of mandal members as well as several men. The objective is to broaden the ownership of the lined pond into the village and develop a committee from women and men. However, because they are not home throughout the year, the men and boys who are involved in this water committee do not feel a part of the village. Their participation in the water committee is limited until they regain a feeling of community.

6.215 Mingalpur

The population of Mingalp ... bout 3000. The Sarpanch lives and works in this village. Over the years, he ... aused friction and conflict for the Mahila Mandal, especially related to the lin- ... d. Darbars are also a strong force in the village. They have used physical p ... re as a means to ensure their control.

Mingalpur has several pot- ... vater sources including two talavs, a government pipeline and two lined po ... he two talavs in the village are used as much as possible before the summ ... ason, though one dries out in February and the second one has water un ... middle of the summer. The water in this second talav is used for all purp ... cluding washing animals, bathing, drinking and washing clothes. The bel ... any villages is that the water in the lined pond is unclean because the plast ... prevents the dirt from purifying itself with the soil, not because they wash ... nes and cattle in it.

The village is at the end o ... overnment pipeline so competition for this limited amount of water has resu ... ighting (verbal and physical).

Two lined ponds were c ... ted in this village due to the large population. Unfortunately, the first po ... destroyed when people stole most of the bricks and cla ... c. Water still co ... his pond and it is used by the village for bathing,

washing clothes and cattle. The second lined pond is the only source of water during the summer and it is used only when there are no other alternatives. A community guard is hired by the village and paid Rs 500 per month (a very high salary) to ensure proper management of the pond. Its water is very important during the summer months when the talavs are empty and the government pipeline does not provide a drop of water for weeks.

The site selection for the lined ponds was difficult because the Sarpanch's agenda conflicted with the mandal and the village. "The women told the people to dig where they felt was the best location. For three days, people dug without an official government supervisor. Women kept a register and recorded the work. The women then convinced the collector and pressured local officials to make payment" (Utthan, n/d).

In 1985, the women in Bhangadh organized into a group. Six months later, the Mingalpur women began their savings and credit group. They organized around the water issue and are now a strong component to the construction, maintenance and management of the lined ponds. They are involved in various activities including sanitation and biogas. They borrowed money from the FWWB but there are problems with the distribution of this money, resulting in the voluntary organizations not working in the village for six months and an internal loss of faith and trust among the village women.

6.3 INTERPRETATIVE PHASE

The descriptive phase outlines the unique characteristics within each village Bereday's second step of comparative analysis incorporates social science into this descriptive information. The researcher's academic background assists in the social science category selection. Five categories are selected for the interpretation of the descriptive information including: economic, environmental, political, social psychological and sociological. These five categories are outlined with a brief example from each village. Refer to Appendix 17 for the complete interpretative analysis of each village based on the five social science categories. An outline of the interpretative phase follows.

6.31 Economic Aspects[36]

It is important to understand the economic impact of migrational patterns, employment opportunities and dependency on moneylenders on the village. For example, migration leaves only the young and old to take care of the village because some families are forced to leave their homes to find employment in order to pay their debts to the moneylenders. For example, in Navagam Kama where the people were experiencing difficulties from the darbars (moneylenders), the threats, intimidation tactics and fear increased over the years. The women were frustrated with the darbars control within their village and they began to meet as a group. The Utthan and Mahiti teams explained what was happening in other villages, like Rajpur

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[36] Refer to Appendix 17 for a full description of the economic aspects.

and Mingalpur, where the women organized into groups to collectively address the village problems. The women of Navagam Karna decided to form a savings and credit group in order to reduce their reliance on the darbars. These women have access to credit at a much lower interest rate than the darbar's money and now, for the first time, women are able to control their own credit without relying on their husbands for household or emergency funds. The Navagam Karna group is discussing an expansion of their credit program into income generating activities where they would receive loans from outside development agencies and consider marketing strategies.

6.32 Environmental Aspects[17]

Throughout this category, the environmental situation of the village will be reviewed with an emphasis on water, women's involvement and the village's future environmental management plans. One environmental issue impacting several villages is the destruction of land, farms, homes and water due to sea ingress. Mangroves were one form of protection against the dangers of the sea until camels began migrating from other areas to graze on these mangroves. In November 1993, the destruction of this valuable natural barrier has resulted in the sea water rising to the villages of Mingalpur and Rajpur. The sea also rose over nine kilometres into the Dhandhuka taluka destroying crops and threatening villages. The land in this

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[17] Refer to Appendix 17 for details on each village.

area is already extremely high in salt. Unfortunately, after years of careful cultivation, the land was awash in sea water.

> "Since 1963, when a similar flash advance of sea on agricultural lands had taken place in the area, every second year there has been a flash flood or heavy rains or a drought in these villages. This year, an estimated 800 families have to deal with a dual disaster: sea invasion and drought" (Bhatt, 1993 5)

The people of the area met with government officials in order to plan for short and long term relief. The villages lost agricultural land and people are migrating to South Gujarat in search of employment.

6.33 Political Aspects[38]

An attempt must also be made to understand the political situation in each village, the status of the village leader as well as the political status of women and their strategic needs. For example, Rajpur does not have its own village leader (Sarpanch); rather, they share with the neighbouring village of Bavalyira Bavalyira has a strong darbar community which often uses physical threats in order to collect their money. These intimidating tactics keep the people of Rajpur from visiting this village and the Sarpanch. A second issue within the political framework is the increasing strategic needs of women resulting from their involvement in the Mahila Mandal. The mandal has helped to bring a great deal of change within the community. They receive respect and support from the men as well as other

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[38] Refer to Appendix 17 for political details on each village.

women who are not in the mandal. The women attend meetings and workshops in other villages in the area as well as the city of Ahmedabad.

6.34 Social Psychological Aspects[39]

Community dynamics can have a very important impact on a community development initiative. Community organizers must analyze and always be aware of the morale of the village in order to determine the potential difficulties which may require special attention because these difficulties may impact on their work and on the villages. For example, in 1995, Mahiti had a shortage of staff and everyone was expected to assist the organization overcome this difficult time. In the process, community organizers were unable to visit and work in several villages which resulted in tension between the voluntary organization, villages and the mandals. Kamatalav was one of these villages directly affected by Mahiti's problems. Five Mahiti community organizers were dismissed, one of whom is a resident of Kamatalav. The obvious tension within the village affected the water committee and the Mahila Mandal, and limited response to a training program and workshop organized by Mahiti. Finally, the problem was addressed and resolved through an open discussion between Mahiti and the village organizations. The positive relationship between the mandals and the voluntary organization was a strong factor in resolving some of the confusion and misunderstandings, although the situation will require constant monitoring.

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[39] Refer to Appendix 17 for psychological aspects in relation to each village.

6.35 Sociological Aspects

The sociological aspects include the influence of outside factors on the village, community organizing, process and participation levels. The women of Anandpura experienced difficulties based on the social problems within the village. The villagers divided into several communities based on internal conflicts which resulted in difficulties working together and joining forces. However, the women attempted to organize a group which would attempt to eliminate their dependence on the darbars. Within a year, when the problems were not resolved, the group dissolved. Still, the women did gain some skills from their short time together. One woman was trained by Mahiti as the village health worker although this woman is not active in the water committee. Through careful facilitation of this process, women could reorganize into a savings and credit group or they could become more active within the village's water committee.

6.4 JUXTAPOSITION PHASE

The information from the "descriptive" and "interpretative" phases is taken to another level of analysis which is known as "juxtaposition." The "juxtaposition phase" incorporates a "simultaneous review of several systems to determine the framework for comparison" (Bereday, 1964: 42).

6.41 Similarities within the Research

A review of the similarities and differences in the information assists in developing the framework for comparison. The similarities are divided into five categories: environmental issues, socio-cultural issues, role of the change agents, gender and drinking water needs. Each similarity is explained in detail below.

6.411 Environmental Issues

Dhandhuka taluka experiences severe salinity problems which increase due to the geo-climatic environmental factors[40]. The five villages in Dhandhuka taluka selected for this research project have similar environmental problems concerning saline land and salinity in the water. The region frequently experiences drought and flooding which cause further damage to the land and people.

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[40] These geo-climatic environmental factors are discussed in Chapter Two. The factors include: land salinity and groundwater quality; flooding and inundation; land erosion and river migration, sedimentation; extreme climate; and evaporation.

Though each village has a traditional talav which collects and stores rain water during the monsoon season, problems develop after the monsoon when the water becomes saline and is nonpotable by summer.

6.412 Socio-Cultural Factors

The population of Dhandhuka taluka has a high percentage of the Koli Patel caste and some of the villages are caste homogenous. The five villages chosen for this research project are predominantly Koli Patel. It is a challenge for community development initiatives to incorporate all castes as this issue is a barrier against the empowerment of all people.

The darbar caste is present in all five villages and has significant control and power in Dhandhuka taluka resulting in fear, exploitation and a continuous cycle of poverty due to financial dependence on these moneylenders. However, some people have developed strategies to deal with their dependence on these moneylenders, i.e savings and credit groups.

Migration and marriages assist in creating a transient society in the rural villages of Dhandhuka taluka. Through seasonal migration, many families go to cities or other centres in search of employment and return home only for a few months each year. Their time in the city teaches them a new lifestyle which alters their views towards village life. When they return home, some migrants are more interested in pop culture than the social and environmental problems in their village. Following from

this, migrants often feel a lack of commitment toward their home villages. Because they live in the rural areas for only a short period of time, it is difficult for them to become actively involved in community development initiatives.

Marriage is another ingredient within a transient society which results in information exchange and awareness raising. Many of the girls from Dhandhuka taluka are married to boys within the same taluka. Villages like Navagam Kama, Mingalpur and Kamatalav have numerous community development initiatives which include women. The unmarried girls learn about savings and credit groups, community development initiatives, Utthan and Mahiti. They take this knowledge with them to their new village. Through this type of networking, voluntary organizations have increased their work, especially organizing women and communities around their social problems.

6.413 Role of the Change Agents

The voluntary organizations, Utthan and Mahiti, attempt to work in all villages with the same philosophy and objectives towards community development. The outcome and approach may not be the same but their work ethics are consistent.

6.414 Gender and Community Organizing

Utthan's mandate is to "establish and support, in resource poor rural areas, self-reliant, local groups that can ultimately handle the development process on their own." Utthan facilitates the organization of women into groups in order to overcome

their isolation, increase their awareness of their own potential and help them articulate problems and perceptions. Utthan now works to organize men and women into water committees which attempt to distribute the responsibilities and commitment to the water systems.

6.415 Drinking Water Issues

The lack of drinking water is one factor attributing to the high migration out of this area. There are two water systems common to these villages; traditional talavs and government pipeline. Unfortunately, both systems are unable to provide adequate water all year. Most of the talavs are dry in February or the remaining water is not potable due to the high salinity levels.

6.42 Differences within the Villages

The similarities of these five villages, however, are not without their differences. The differences include community issues (population, culture, village leaders and village networking); community development process (problem identification, technology identification, acceptance of technology and village development); and approaches developed by the change agents (gender). These differences are described below

6.421 Community Issues

Population

The village of Rajpur has a small population due to high migration. The population is homogenous regarding caste and religion (Koli Patel and Hindu, respectively). Mingalpur's population is about 3000 with a variety of castes.

Culture

Only one village, Rajpur, does not have access to electricity while the other four villages have sporadic power sources. The lack of electricity makes Rajpur less dependent on outside media and, therefore, it continues to maintain a strong sense of community and traditional culture. For example, the social entertainment for women, young girls and boys includes singing and dancing to traditional songs. The younger generation participates by creating their own songs based on traditional folk songs. As the people migrate or girls move due to marriage, they take this community and family pride with them.

The other four villages' accessibility to electricity includes the use of radio and television. Because people watch Hindi soap operas and listen to the radio in the evening, the village culture has a broader awareness of state, national and some international issues.

Village Leaders

Two issues of concern with respect to the Sarpanch are his home location and his reaction to the community development initiatives. On the first issue, two of the five villages share their Sarpanch with a neighbouring village. The second issue focuses on the Sarpanch's reaction to the initiatives. One village has experienced extreme difficulties from the Sarpanch who did not support community development initiatives, especially drinking water. In another village, the Sarpanch was apathetic towards the community process and involvement of outside organizations in the village's development. There was only one village where the Sarpanch approached the voluntary organizations for assistance and strongly supported community development for the entire village.

Village Networking

The connection between Mingalpur and Rajpur is important. Because Rajpur must rely on Mingalpur for provisions, it maintains a continuous contact and link with this village. As the women of Mingalpur learn how to organize into groups, they share their experiences with Rajpur where the women are strong, independent and able to manage their resources. Still, they learn from Mingalpur, a village where the women are constantly facing difficulties from the Sarpanch, other men and the rest of the village. The population of Mingalpur is much higher at about 3000 with a multi-caste culture. The neighbouring village of Bhangadh is the home to the Mahiti leader. These two villages often work together and receive extra support from Mahiti. In 1994, Mingalpur borrowed some money which was not distributed

according to the guidelines by the funding agency and the Mahila Mandal. The money was used for personal benefits as opposed to the development of the group and the village. This action resulted in divisions within the mandal and the village. Mingalpur is considered to be the role model for community organizing and development in the Bhal but this incident tarnishes the reputation of the mandal.

Navagam Karna also received ideas and support from Mingalpur. Though they experience difficulties, they are able to manage their systems. The Mahila Mandal began with savings and credit before it ventured into drinking water initiatives. Because the women did not want to rely on or be controlled by the darbars, the mandal's savings and credit was a welcome alternative to the exploitative moneylending system. The Mandal welcomes all women, even the newlyweds who are glad to meet people in their new homes. An awareness programme conducted in June 1995 brought the village together to discuss the issues of management of water systems. Women and men voiced their concerns and began to plan the future of their systems.

6.422 *Community Development Process*

Problem Identification

Every village is unique. There is not one formula for community development which will answer all questions and resolve all problems; each village must go through its own unique problem solving even though they are in the same taluka and suffer similar geo-climatic environmental problems but each village must be examined as

a new case. For example, the salinity issue is more severe in two of five villages. The voluntary organizations believe that the water in the lined ponds will become less saline two years after the construction is completed. It takes about two years for the salinity levels to reduce (Researcher's interview with Barot, 1996)

Technology Identification

The drinking water technology used in the villages of Dhandhuka taluka includes a combination of indigenous knowledge and alternative strategies. The idea developed when villagers, who migrated to work on dam construction, transferred their knowledge to the village's salinity problem. The dams were lined with plastic and the villagers felt that this simple technique could be used to prevent salinity from seeping into their drinking water.

Acceptance of Technology

The technology incorporated into the five villages is culturally acceptable, relevant and appropriate for each village. A village may need a new water supply but this does not mean the village is ready to take on a community development initiative which includes drinking water programmes. For example, Rajpur approached Utthan and Mahiti for assistance regarding the village's drinking water problem. A lined pond was constructed so that presently the village manages their drinking water systems. On the other hand, Anandpura was selected by Utthan in the second phase. The village does not claim responsibility for the lined pond nor do they manage or maintain their system.

Village Development

The villages are at various phases within the community development process. The voluntary organizations believe it takes about two years for a village to fully accept the responsibility of a new water system. Mingalpur has ten years of previous experience and received a great deal of attention and support from external agents (i.e. government and voluntary organizations). While Rajpur is only recently being recognized for their work and commitment to community development, other villages, like Anandpura, recently completed their lined pond and must now begin monitoring and management training.

6.423 Approaches Developed by Change Agents

Change agents play an important role in community development initiatives, institutionalization of decision-making and community management. The two change agents are the voluntary organizations and the community-based groups (i.e. Mahila Mandals and water committees). All of the villages have worked with Utthan and Mahiti to some degree, but not all have a Mahila Mandal or water committee to assist in facilitating the community development initiatives in the villages. There is resistance within the village if the community-based group is not well-established, organized and trained in various community development techniques (i.e. problem solving). There are water committees in three out of the five villages while Mahila Mandals are organized in four of the villages.

Gender Factor

The power structure within the village and the family is an important part of the Mahila Mandals. Women have learned to work through an informal agenda which focuses on their personal concerns, family issues and the need to be recognized by the power holders within the village. "The Mahila Mandal recognizes the need to have their organization and its activities sanctioned and legitimized by those who currently hold power and authority" (Wilkinson, 1990 p. 13). The Mahila Mandal realizes they need support from the village men in order to successfully carry out a community development programme so the women are careful to work on their needs without neglecting them. For example, when the Mahila Mandal in Mingalpur began to meet and decide on their action plan, there was a conflict. The women explained that they wanted to buy water buffaloes so they could sell the milk. After discussions, it was determined that the women were being pressured by the men who wanted the water buffaloes in order to develop economic activity within the household.

Women were aware of the serious drinking water problem faced by the entire village. Women continued their dialogue with the Utthan and Mahiti team members and "slowly re-focused their attention away from concern for individual income towards their own concern for household and community well-being" (Sreenivasan, 1991: p.16). They needed to receive the support of the men in order to have a successful community development initiative. The women reworked their approach and re-evaluated the benefits to improving the community's drinking water systems.

The benefits for the women and men are different. The women carefully redefined the purpose of constructing a lined pond in order to address the needs of men. The emphasis of the initiative was placed on the employment opportunities during the construction phase.

Utthan and Mahiti believe that women are the leaders within natural resource management in their villages. Drinking water is a woman's issue at the household level but at the village level, men want to maintain power and control. When one reviews the villages of Dhandhuka, it becomes apparent that women's participation is not enough to ensure the proper management and maintenance of a community drinking water system. Women are actively involved in Kamatalav, Mingalpur and Navagam Kama yet the village does not manage, monitor and maintain their drinking water systems. Rajpur includes women, men and children into the process and the entire village claims ownership and responsibility for all their water sources. In Navagam Karna, the village feels that the lined pond belongs to the Mahila Mandal, so they do not want to take responsibility for the pond. Anandpura shows that men's involvement is important but it is not enough to change the village situation. Though women are the main users of water facilities and they must be included in the process, men must not be excluded.

The voluntary organizations realize that overlooking men in some of the community development process results in tension and difficulties within the village. In an attempt to remedy this problem, water committees are organized as a means to

bring women and men together to manage, monitor and maintain community water systems.

6.43 Summary

The drinking water crises in the Bhal is reduced through community participation and management of water systems. A special emphasis on women without excluding men results in positive participation, management and action in the village. The women assist in strategically planning action. The voluntary organizations strategically plan the process which brings women and men together to focus and work on their village problems.

There are certain prerequisites which foster change within community development. Drinking water initiatives also are influenced by these prerequisites to change. Four of these prerequisites include gender relations; role of the change agents; community development process; and village leadership and awareness. The next section will explore the development hypothesis through a comparison analysis

6.5 COMPARISON PHASE

"Comparison" is the final phase in Bereday's comparative analysis framework. The qualitative data will be organized to reveal the nature and the interconnectedness of the complex issues. The development hypothesis states that there are certain prerequisites which foster change within community development. Four of these prerequisites include the role of the change agents; gender relations; the community development process; and village leadership and awareness. Each prerequisite or condition is explained below.

6.51 Role of Change Agents

There are two levels of change agents which impact community development in rural villages in Dhandhuka taluka. These change agents serve as interdependent mechanisms for delivery of social services in the community. The first change agent is the voluntary organization; the second is the community-based groups, i.e. Mahila Mandals and water committees. In Dhandhuka taluka, the voluntary organizations have information on government services and programmes, funding sources and connections to state and national issues involving community development. This information and networking is shared with the community-based groups in order to raise awareness, develop community programmes and remove the feeling of isolation which arises from a lack of community organizing as well as insufficient services and attention to the entire Bhal area. The Bhal region, including Dhandhuka taluka, is known as the "Area in Red" originating from a government report which designated this area as the most underdeveloped part of the state.

Government felt that the best solution would be to relocate the people to a new region in the state. However, Utthan believes that development and change is possible in this area if the people organize and develop their resources.

It is understandable that village men and women would be reluctant to participate in development programmes. First, the villagers lack confidence in their skills, resources and capabilities. Second, they view outsiders as dominant forces who implement projects regardless of the communities voice and perspective. The village also believes that the projects will be managed, monitored and maintained by the outside agency. The voluntary organizations assist in organizing the villages, providing information on available services and developing trust towards outside agencies. The community-based organizations play an important role in building trust between the various communities in the village. The community group also assists the village to claim ownership and responsibility for their own development.

The voluntary organizations become overwhelmed with the variety and complexity of the problems in the villages. The problems may be similar in all of the villages but the internal factors are different because each village has its own unique traits. These traits must be taken into account when developing community initiatives. Though the approach for each village may have some underlying similarities, one formula can not be used to resolve all of the problems. Since there is a continuous process which is developing and growing, the voluntary organizations are constantly learning from their previous successes and failures. This process of self-evaluation

is important for the success and continuation of any community development initiative.

6.52 Gender Relations

A gender analysis explores the impact of men and women on community development initiatives, especially drinking water programmes. This gender perspective examines the impact of the initiative to enhance the role of women and improve their position in society relative to men. Through an examination of natural resource management, it is apparent that women and men are affected differently. Women are actively involved on a daily basis with various aspects in natural resource management, especially drinking water. Elmendorf and Isely define four areas where women's involvement in water activities are important;

> "1. As accepters or rejecters of technology which is based on their knowledge of water and sanitation issues as they affect the family
> 2. As users of improved facilities
> 3. As managers of water supply and sanitation programs
> 4. As agents of behavioral change in the use of facilities"
> (in Assad, el Karsha and Watts, 1994: 116).

Regardless of these four areas of involvement, various cultural, social and political factors prevent women from fully participating in community development projects, especially drinking water initiatives. Two specific reasons include economics and power. First, the economic reason addresses the monetary value placed on work. The household responsibilities placed on women are a large component of their daily work, though they do not receive monetary payments for this work. One of

their main responsibilities is the collection and distribution of water. Since an economic value is not placed on women's daily informal responsibilities, they are often overlooked by men and community development workers. Second, the formal political power within the village is controlled by men. When an outside organization visits the village, meetings are often held with these male political leaders. It is difficult for an outsider to speak with the women of the village and it may be necessary for the outsider to work in the kitchen or collect water with the women in order to talk to them.

It is important for women and men to manage community resources like a drinking water system. The people of Rajpur work together to ensure the proper use, management and maintenance of their water systems. They view all their water sources as important resources which must be carefully monitored and managed. One approach used in Rajpur and Navagam Kama is to connect religion with the village resources. For example, if a goddess and a small temple are placed near the water source (i.e. lined pond or talav), the villagers will maintain this water system and follow community guidelines and rules about the use of the water. The place holds special spiritual value to the entire village. Several of the other villages are considering this approach as an option to controlling the misuse of the water systems.

When a water system is misused, the initial reaction is to blame an individual or a group. In the case of Dhandhuka taluka, women are the main users of the water

facilities. Because they collect drinking water, wash clothes and vessels as well as take care of the cattle, women are often blamed for abusing the water systems when they are doing their daily chores in the system (i.e. lined pond). In many cases, there are no alternatives for the women or the village. Women wash their clothes where there is available water. Individuals and groups are not at fault or to blame for using the water systems. It is necessary to develop alternatives which best suit the individual village and the users of the facilities. For example, in Rajpur, each household has a place to bathe, wash dishes and utensils close to their home. The village has developed an alternative which is suitable for everyone. Two of the villages in Dhandhuka taluka plan to build a separate place for washing clothes and utensils, a place which would be close to the handpumps.

6.53 Community Development Process

All villages are unique. The culture in each village is distinctive which indicates that a community development formula can not be designed and followed by the voluntary organizations. Although the voluntary organizations can learn from past successes and failures in an attempt to improve future endeavours. Through this analysis, there will be a broader understanding of community development initiatives for the voluntary organizations and the community-based groups.

The drinking water initiatives are a long term and continuous process between Utthan, CDWRM, Mahiti and the people. The objective of the process is self-reliance where the people will need little support from the voluntary organizations.

Utthan's Executive Trustee explains that she is not worried about internal social problems with the drinking water systems in the villages. Each village experiences difficulties but they must learn to work these discrepancies out among themselves in order to develop, manage and maintain their common property resource. It could take more than two years for some villages to work through their problems and claim full responsibility and ownership for their water system (Researcher's interview with Barot, 1995).

The drinking water initiative does not end with the construction of the lined pond and the installation of the handpumps. It is a continuous process that is based on the organization of the people. Villages address problems through different approaches For example, there was a conflict in Navagam Karna over a labour issue and the Mahila Mandal reacted to the village problem by discontinuing meetings until the problem was resolved. The problem was settled and the women gained respect for their approach to the issue. The women now manage the lined pond and ensure the sustainability of the initiative.

In Anandpura, the water committee began by participating in a handpump training session. Over several months, CDWRM's chief engineer and Mahiti staff met with the water committee in order to discuss the lined pond and the potential awareness programme. The attitude of the men towards the lined pond became positive as they continued to meet with the voluntary organization and a new understanding evolved towards the importance of the lined pond and other village water systems.

It will be interesting to follow the development of Anandpura and the water committee over the next couple of years.

Each village must go through its own process. There is not a formula which works for all villages. Community development is difficult, time consuming and requires a lot of patience and devotion on the part of everyone involved. If one is to examine the lined ponds as only a technical "project" then the twenty completed ponds are successful and functional. However, this analysis would be an injustice to the voluntary organizations who believe that the long term goal of the lined pond initiative is to organize people to address and take responsibility for their social problems. Community organizing is necessary to attain village ownership of community issues and natural resource management systems.

6.54 Village Leadership and Awareness

Most villages in Dhandhuka taluka are in desperate need of water, especially in the summer months, but a need does not mean that a village is ready to take the responsibility of a new system. Some villages approached the voluntary organizations for assistance with their water problems. In this research, three out of five villages approached Utthan and Mahiti regarding the lined pond initiative. Rajpur organized themselves into a group in order to address the village's water problems. They learned about Utthan and Mahiti through another village and approached the voluntary organizations for assistance.

A second example in Kamatalav stems from the Sarpanch's desire to improve the living conditions in his village. He heard about Utthan and Mahiti and attended a workshop organized by the voluntary organizations. The Sarpanch learned about village problems and solutions in other parts of Dhandhuka taluka and he asked Utthan and Mahiti to help organize his village.

The third village, Navagam Karna, learned about Utthan and Mahiti's lined pond initiative from other villages (i.e. Mingalpur and Rajpur) and they became excited and eager to have one for themselves and to start working towards change. The village of Anandpura was not at the same level of awareness. Utthan and Mahiti brought the lined pond idea to the village. This village needs to continue building informal and formal leaders as well as organizing the people around their social and environmental problems. There are many internal social conflicts which demonstrate a lack of cooperation and interest to work towards a common goal.

Four of the villages have strong and independent informal leaders (i.e. Gauribahen in Kamatalav) who take the initiative to ensure that the work is completed and the village is aware of the issues and actions. Through the identification of informal leaders and awareness and consciousness-raising of these individuals, the community begins to work together under their guidance. These informal leaders, essentially, are the most important change agents to a community. They motivate, challenge, initiate and facilitate the community development process. They live in the village and know the cultures and dynamics of the communities. They have

gained respect and credibility from their people. An example of the importance of this leadership is the leader of Mahiti who is from Dhandhuka taluka Through her concern for her village and her family, she wanted to improve the living conditions in the area. She has challenged the power structures and the dominating forces affecting her life and her village. Through her struggles, she has gained self-confidence as well as respect from the people of Dhandhuka taluka.

CHAPTER SEVEN

CONCLUSIONS

7.1 Development Hypothesis

The development hypothesis explores the complexities of community development in rural Gujarat. The findings attempt to determine the nature and the interconnectedness of these complex issues. The development hypothesis states that there are certain prerequisites which foster change within community development. Four of these prerequisites include gender relations; role of the change agents; the community development process; and village leadership and awareness.

7.2 Additional Prerequisites

The comparative assessment of the research findings supported the development hypothesis that there are certain prerequisites which foster change. There were four prerequisites highlighted in the analysis. However, there are some remaining issues which impact community development initiatives in rural Gujarat. These issues focus on the change agents, particularly the voluntary organizations. These components are divided into two categories: internal and external factors. A brief explanation of these factors will clarify their relevance to community development in rural Gujarat, specifically to the work of Utthan and Mahiti. The explanation of these factors follows.

7.21 Internal Factors

There are several internal factors which affect the working environment of the voluntary organizations. It is important to discuss these factors and consider their impact on community development. In 1994, Mahiti legally became an independent organization. This independence requires some changes within the organizational structure and management. The following issues and recommendations remain critical for the Utthan and Mahiti staff. The factors include: management structure, management training and experience; low benefits and conceptual understanding Each factor is explained in detail below.

Management Structure

In 1981, Utthan organized Mahiti in an attempt to foster a locally run movement for regional development. From the beginning, Utthan and Mahiti discussed the independence of Mahiti as a self-reliant group. In 1994, Mahiti officially became an independent organization. Unfortunately, there are weaknesses within the separation plan. Utthan maintained control over Mahiti's project development and management processes. This control led to Mahiti's dependence on Utthan to write funding proposals, budgets and reports.

The inadequate facilities at Mahiti Centre (i.e. no phone or computer; electricity is seldom available) also makes it difficult to write reports and maintain contact with funding agencies. The reality of community development in Gujarat is that organizations applying for funding outside of the state must know how to speak and

write in English and Hindi. Mahiti's dependence on Utthan to contact external funding agencies must be addressed by both voluntary organizations and the funding agencies.

Management Training and Experience

Community organizers must also receive additional training pertaining to their responsibilities, including management approaches and communication skills. Mahiti and Utthan team members do attend some government programmes which offer training on specific issues (i.e. biogas, health) but there is still a need to conduct internal training sessions on community organizing in order to diversify their organizational skills, re-energize ideas and develop new approaches to organizing rural villages in Gujarat. Training programmes, institutions and appropriate courses must be identified by Mahiti and Utthan.

Low Benefits

The low salary structure of the two voluntary organizations has disheartened staff. The increased workload and responsibilities coupled with the limited staff adds pressure and stress on the team motivation. Utthan and Mahiti are aware of the need to recruit more people with technical skills and experiences to join the teams, though it is difficult to find skilled individuals who will work for the uncompetitive salary offered by the voluntary organizations.

Conceptual Understanding

There are different levels of understanding of the conceptual issues within community development. For example, Utthan's leader views the issues and problems through an awareness and understanding of national and internationally development issues. She is exploring natural resource management and gender issues on a national and international platform. The community organizers in Utthan and Mahiti do not always understand or share this perspective on development. The different levels of understanding and interpretation of the information has caused some confusion with regards to strategic planning.

One of the reasons for the diversity of development comprehension is that Utthan's and Mahiti's work has often focused on individual initiatives as opposed to reviewing and analyzing all the projects. The teams must begin to review all their activities through a holistic analysis.

7.22 External Factors

Other factors affecting change are a component of the voluntary organization's external environment. These factors include funding agencies and networking among the external change agents. The issues pertaining to these factors are explained below.

Funding Agencies

Some funding agencies place pressure on voluntary organizations to produce quantitative results. Money is allocated for a specific project and funding agencies want concrete results for their financial contribution. The funders often believe that the process of community development is not important if quantitative results can not be visibly measured. Voluntary organizations, like Utthan and Mahiti, believe in the process including the empowerment of communities in order to attain self-reliant local groups. This difference of opinions between the voluntary organizations and funding agencies results in problems and pressure. The main problem is when community development initiatives are rushed to produce concrete results in order to secure funding.

One example is the handpump[41] training programme which is an integral part of developing water committees. The training programme objectives are to train local community members (women and men) on handpump installation, maintenance and repair. The funding agencies provided unrealistic deadlines for the installation of the handpumps. The voluntary organizations conducted several training sessions but in the end were forced to install the handpumps without the community's water committees involvement or training sessions. The training sessions were organized for a later time with the committee members but interest was low because the work was already completed by the outside agents.

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[41] *The handpumps are attached to the filters of the lined pond.*

Networking among Governments, Voluntary Organizations and Academics

NGOs and voluntary organizations have proven to be efficient and effective mechanisms for promoting and facilitating community development at the grassroots level. Utthan and Mahiti are two local voluntary organizations which follow community participation theory within their field work. These voluntary organizations play an integral role in raising awareness as well as organizing villages around their natural resource management problems, especially drinking water shortages

NGOs and voluntary organizations can increase and improve their role within the drinking water sector. If these organizations are properly trained and funded, they will have a strong positive impact on the drinking water sector. These organizations must also begin working together and developing partnerships

The objective of increasing the dialogue among the various players (i e government, NGOs and academics) is to gather knowledge, identify the problems and opportunities, establish mechanism for working together to overcome problems and to take advantage of these opportunities. Utthan attempts to bridge the gap between NGOs and government in Gujarat through supporting the creation of PRAVAH. In October 1994, a network called PRAVAH was formed by voluntary organizations and individuals involved in Gujarat's drinking water sector. PRAVAH aims to initiate a process that leads to sustainable solutions to the drinking water problem in all Gujarati villages. A working group, comprised of representatives from NGOs, scientists, academics and journalists, is organized in order to determine the

future direction and role of the network. PRAVAH's task is to enable community development processes which ultimately support women and communities to express their basic rights. Networking is an important tool for the drinking water sector to communicate and develop a unified voice.

7.3 Indicators of Success within Villages

If a voluntary organization and/or government is going to invest time and money on a community development programme which focuses on drinking water initiatives, one would want to chose villages with the greatest likelihood of success. Some criteria for organizations to consider based on this research and the comparative analysis are listed below.

Village Demographics

The population size and the diversity of the villages should be taken into consideration when developing a work plan. A larger village with a variety of castes will take more time to organize and facilitate community development initiatives. From Utthan's and Mahiti's experience, villages which have a smaller population are easier to work with on common property resource issues. Migration, social homogeneity, cooperation, leadership (informal and formal), and awareness of empowerment are factors for consideration when selecting villages for community development initiatives.

Village Leadership

It is important to examine the existing and the potential leadership within the village The capacity for leadership will indicate the level of commitment required by the voluntary organizations. The informal leaders are important resources for a community development initiative.

Village's Level of Interest

The village should accept that they have needs and want to work towards resolving these issues. When a clear interest is expressed by the village, the voluntary organizations can begin working towards social and environmental change and development through community organizing. A willingness to discuss community issues and plan solutions is an important component once the interest is established by the village. The village must also have the potential to make and implement decisions. All these requirements will not be initially obvious within the village. The voluntary organizations must facilitate the strengthening of the village's capacity to address these requirements.

7.4 Criteria within the Community Development Process

Voluntary organizations must plan the community development process. As already stated, the process is not uniform and a formula cannot be followed for each village However, there are lessons learned from previous experiences which allow the process to develop and mature. These lessons become criteria for future community development initiatives. These criteria include water committees,

awareness programmes, Mahila Mandals, water initiatives, ownership and control, viability and sustainability; and internalizing environmental and economic costs. The focus of these criteria are on the water sector but they could also be transferred to other community development initiatives. The criteria reached following the comparative assessment are as follows:

Water Committees

A water committee should be organized and functioning during the initial needs assessment phase. The water committee should consist of women and men from all segments of the village. The roles and responsibilities of this committee should be clearly defined in the beginning to the water committee members and the entire village.

Awareness Programme

The awareness programme should be a continuous initiative in conjunction with the water committee. Presently, the awareness programme is organized by Utthan and Mahiti for the villages after the lined pond is constructed and the handpumps are installed. This programme could incorporate alternative approaches (i.e. popular theatre, drawing, drama) in order to address the issues.

Mahila Mandal

Women should have a platform where they can discuss issues and search for solutions. Mahila Mandals provide this platform for organizing and addressing

personal and community problems. Mahila Mandals should also be organized within the village in conjunction with the water committees. Before women were involved with Mahila Mandals, they worked alone, confronted problems alone and were isolated from each other. Mahila Mandals enable them to overcome this isolation, increases their awareness of their own potential and helps them articulate their problems and perceptions.

When the Mahila Mandals focus on savings and credit, the women escape indebtedness while participating in group credit systems with low interest rates. This group also has non-monetary benefits and require some women to gain minimal literacy and numeracy for record-keeping.

Water Initiatives

Water problems in Gujarat are a result of the mismanagement of the rain water. If the water is properly managed, there will be enough for the year regardless of the amount of rainfall. These lined ponds work because they are locally managed, decentralized and take into account local geo-climatic factors.

The lined pond alternative is successful but it is important to ensure that the village examines all possibilities before making a final decision on one alternative. For example, roof water collection is an alternative discussed for future initiatives to complement present village water systems. Since women are the main users of

water systems, it is important to ensure that they are not blamed when the system is misused. There must be alternatives developed for the village.

Ownership and Control

It is important to ensure that ownership and control of the community development initiative is equally held in the hands of the people. The formation of water committees, Mahila Mandals and the awareness programme would be positive facilitators to assure the ownership is the village's responsibility.

Viability/Sustainability

The initiative must be sustainable for the village and the natural resources. The community could explore the potential economic benefits to be acquired from the initiative. The economic aspect of an initiative will draw the attention of the men from the village.

Internalize Environmental and Economic Costs

In discussion with the community, it would be beneficial to link monetary benefits with personal investment. The next step would be to make the connection between personal investment and natural resource management within the village.

7.5 Conclusions

By its very nature, community development has the potential to arouse conflict because of the shift in power relations that is expected to occur. This conflict can

be productive and positive in changing the power imbalance and this shift in power can be beneficial to the community and the organization. This is likely to occur only if the potential for tension is recognized and planned for in advance.

In the case of Utthan and Mahiti, it is important that they strategically plan their community development initiatives. The actual process will be different for each village but strategies based on their previous work can be discussed, organized and prepared. The drinking water initiatives facilitated by Utthan and Mahiti have a solid community development foundation which shows the effectiveness of a decentralized and participatory programme. The open-minded and critical approach of their work has allowed Utthan and Mahiti to be progressive and on the cutting edge of rural development in Gujarat.

The Utthan and Mahiti teams undergo a process of consciousness-raising and evaluation which assists them to strategically develop their work based on previous experiences. Their process of self-evaluation is more productive through the assistance of an outsider who is knowledgeable of their work yet who can also remain objective.

Through the analysis of the five villages selected for this research, it is apparent that one village rises as a leader within the community development initiative. Through a careful examination of the information, it appears that the voluntary organizations and the community-based groups were able to address social problems in this

village in a systematic and professional manner. The village has reached self-reliance and accepts support from Utthan and Mahiti. They realize the need to develop partnerships and continue networking through the assistance of Utthan and Mahiti. This village claims ownership for all of their water systems. What makes this village unique? They still have social and environmental problems but how were they able to develop self-reliance and ownership over their drinking water systems?

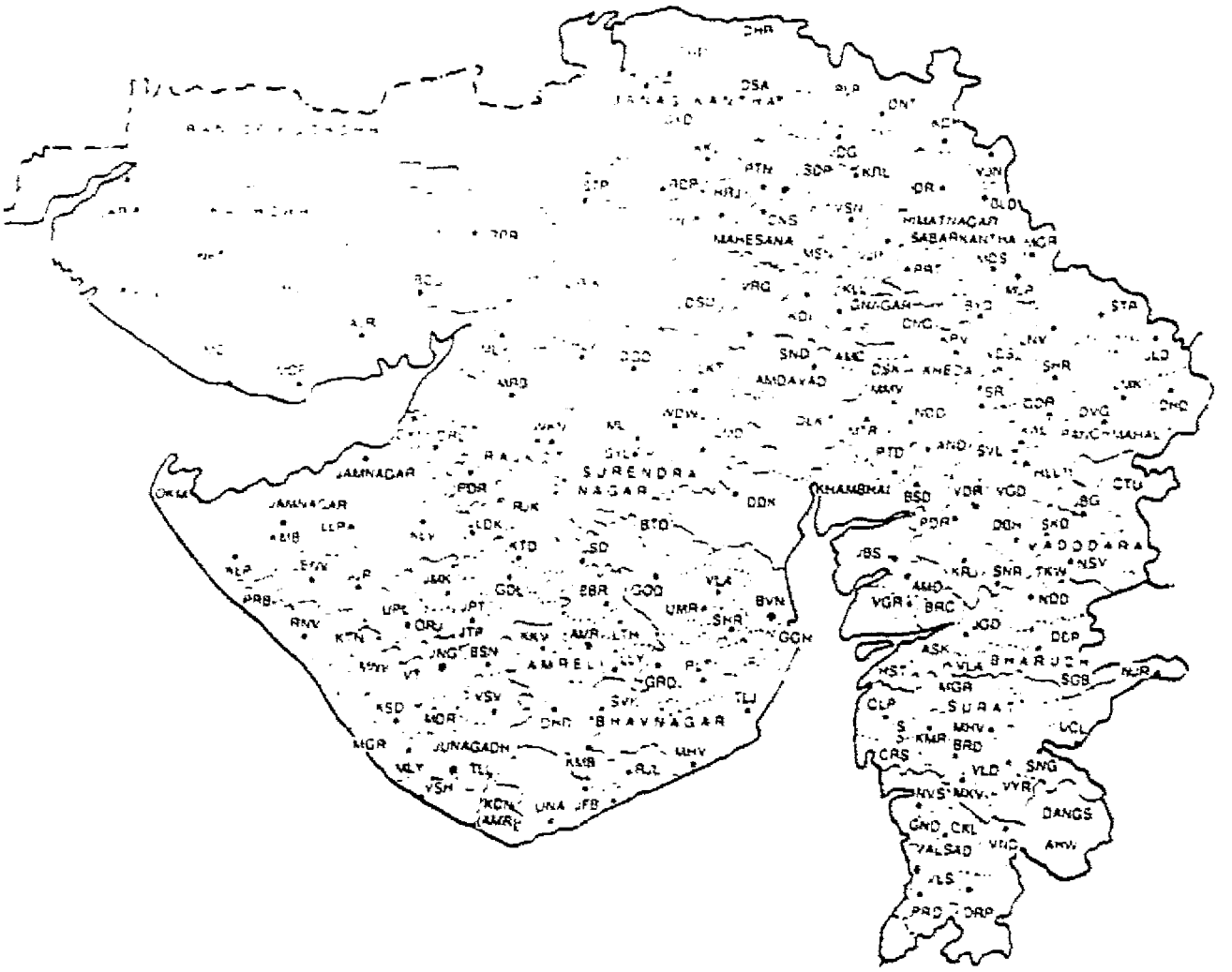
When all the prerequisites discussed in this report are combined, the explanation for the different results becomes apparent. However, village leadership is the prerequisite which offers additional information regarding self-reliance, empowerment and participation. The informal and formal leaders in each village account for the success of any community development initiative. When Utthan and Mahiti enter a new village, one of their first activities is to determine the potential leaders within the village. Through guidance and awareness of the issues, these individuals become the supporting structure to the success of the projects. In each village there are formal and informal leaders who assist in determining the direction of the community development initiative.

Utthan and Mahiti have focused their efforts on developing women's groups as well as informal female leaders within the villages. It is important to provide women the opportunity to develop their leadership skills and self-confidence. Women can not be excluded from the process which means that special consideration must be taken to ensure that they actively participate in community development initiatives.

I hope that Utthan and Mahiti are able to learn from their previous experiences in order to bring their special community organizing and facilitation skills to other regions of the state. Their ability to work with all members of a village and their extensive experience with drinking water issues in Dhandhuka taluka should not be exclusive to only this region. The development approach followed by Utthan and Mahiti is a model of decentralization, use of traditional knowledge, incorporation of gender at all levels of an initiative, and the development of local resources through a self-reliant and sustainable manner. Utthan and Mahiti have extensive skills, knowledge and experience to share with other organizations. Their strong involvement in PRAVAH will assist the state's drinking water sector.

Appendix 1

Map of the State of Gujarat



Appendix # 2

Women's Savings and Credit Groups

(Mahila Mandals)

When Utthan and Mahiti began working in the Bhal region, their work focused on the village with an emphasis on organizing the people around their social problems. As their work progressed, they became aware of the women who were willing to address their problems, search for solutions and stand up and fight for change It seemed that the men had lost faith in the "system". It became apparent that women would work with Utthan and Mahiti. In the attempt to change the social problems in their communities, women became empowered. They gained respect from other women in the village, from the men, government officials and funding agencies They were able to ask for the changes that they wanted. They were no longer afraid to go to the government offices or to take the three hour bus trip to Ahmedabad in order to talk to government and voluntary organizations.

Over the years Utthan and Mahiti realized that they must pay special attention to the women in the villages if there was going to be change in the area. They began their work with initiatives that supported the organizing of community groups, especially women. The acute problems in the village are apparent yet it is difficult for the communities to understand the complexities and interconnectedness of their situation. Once a group is organized, discussions revolve around what activities

would be important for the village. Through these meetings, people begin to understand the fundamental problems which must be addressed first.

The women in the Dhandhuka taluka organized around social issues which affected them within their own villages. These women's groups are called mahila mandals in Gujarati. Once organized and established, some of the mahila mandals discussed the possibility of becoming registered including the advantages and disadvantages for their group and village. As a registered group, you are able to apply for funding from the government for projects and initiatives through your mandal.

Mahila Mandals were organized by women in the villages of the Bhal with support from Mahiti's community organizers. The women decided to focus their activities in certain areas which was dependent on the problems within their village. A number of the villages began by addressing the serious economic constraints faced by families due to their dependence on moneylenders. Women decided that they could begin their own savings and credit group.

In a number of villages, the savings and credit groups were the main activity of the mahila mandals. Some of these mandals expanded their invcivement with the community through health programmes, drinking water activities, kindergartens and marketing of seeds.

Women in each village follow a principal of meeting and interacting on a regular basis. The operational system evolved through the initial development of the group The basic objectives are;

- to gain economic freedom from the moneylenders
- to have access and control over their own resources
- to mobilize more resources
- to create some kind of asset for themselves and their families in the future

The savings and credit groups became a strong component within a number of villages in the Bhal. There is a simple procedure which is followed by the mandal In order to join a Women's Savings Group, a woman must attend one meeting and make a nominal deposit of Rs 10. There are regular meetings where every member must give Rs 5 to the group. The responsibility of the money is divided equally among the group. One member takes the locked safe, someone else holds the key, two other members each hold a safe for storing borrowers' collateral and someone keeps the record books.

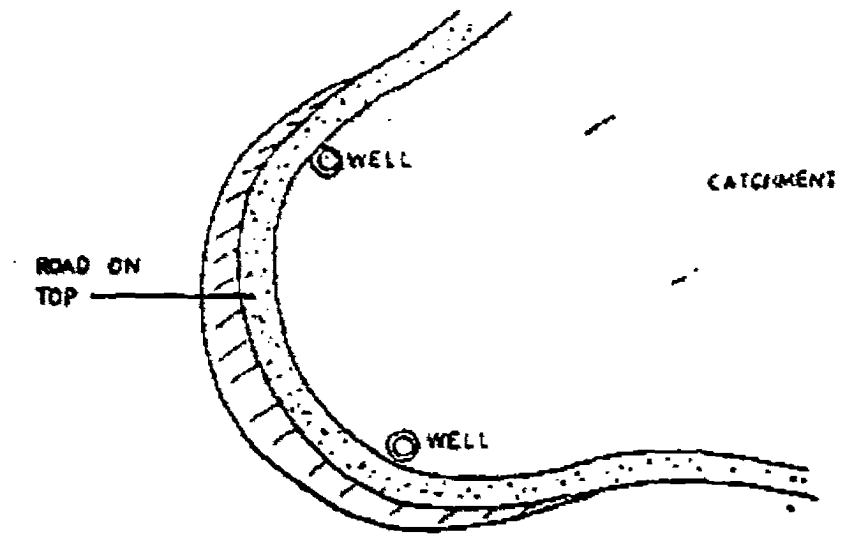
Two books are maintained; one is a cash book which records each transaction as it occurs while the second keeps track of individual members' current balance. There may be a literate woman within the group who keeps the accounts or a Mahiti community organizer will assist the group. All members have access to loan funds as soon as they have joined the mandal. There is no restriction on the use of the loan although this must be declared to the group. (Sreenivasan, 1991)

Appendix 3

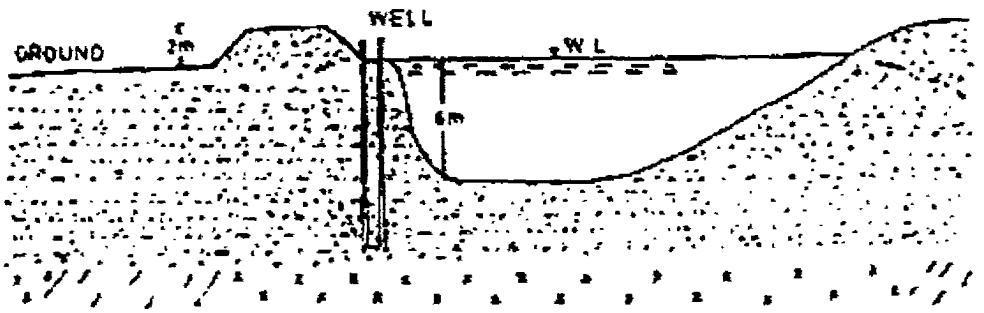
Women Collecting Water from the Government Pipeline

Appendix 4

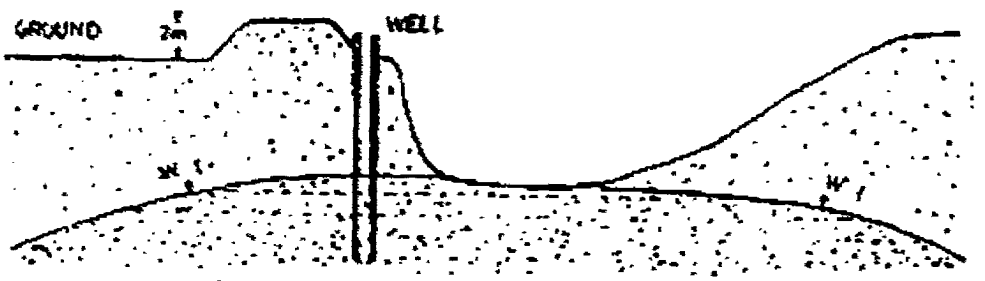
Schematic Diagram of a Village Talav



PLAN VIEW



SECTIONAL VIEW (POST MONSOON)



SECTIONAL VIEW (PRE-MONSOON)

Appendix 5

Village Talav

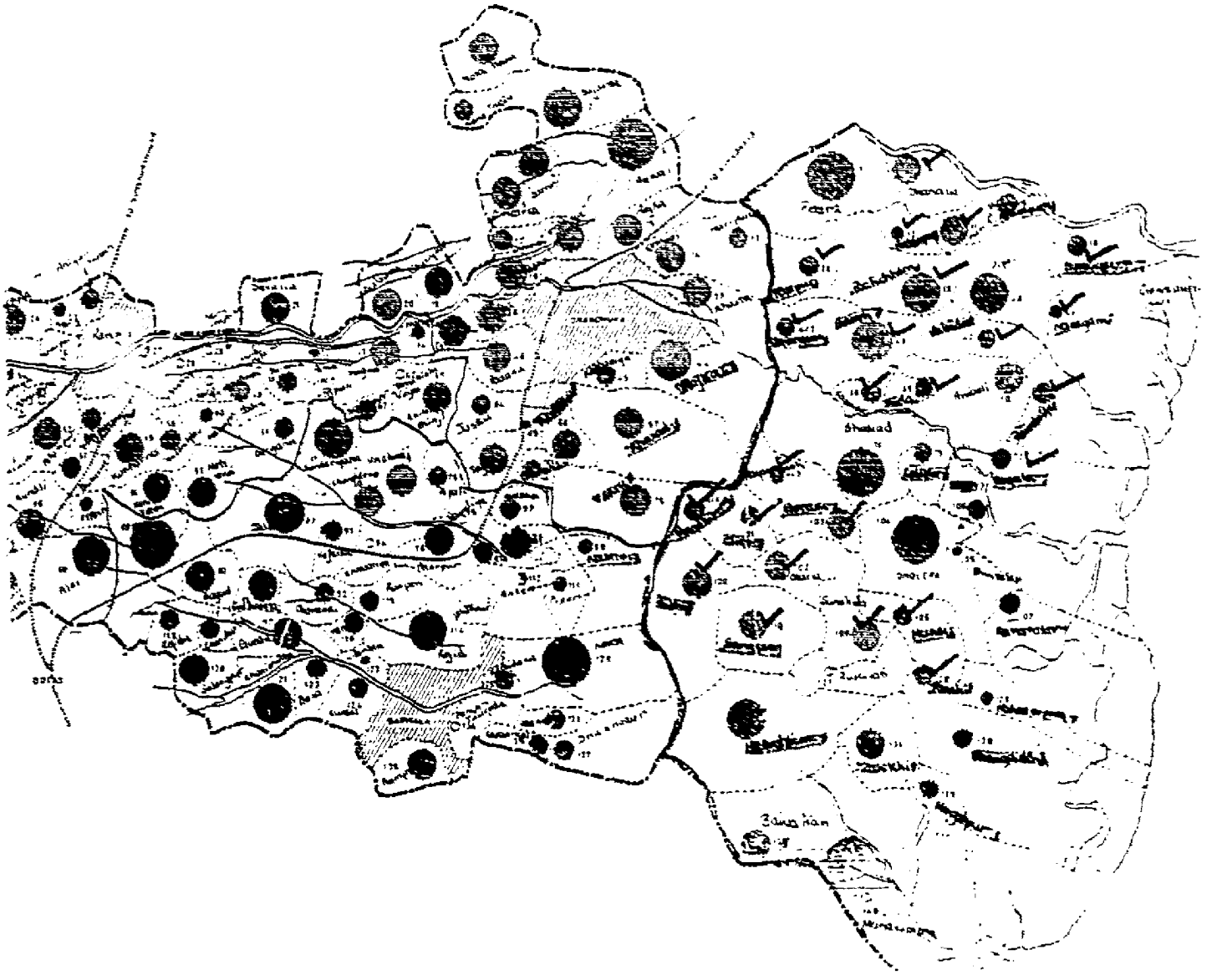
Kamatalav (March 1995)

Village Talav

Rajpur (April 1995)

Appendix 6

Map of Dhandhuka taluka



Appendix 7

Lined Pond

Women Washing Clothes in Lined Pond

Appendix # 8

List of Villages in Dhandhuka taluka with Lined Ponds

VILLAGE	YEAR OF CONSTRUCTION
Anandpura	1993
Navagam Karna	1992
Buranpura	1993
Valinda	1993
Kamatalav	1993
Khun	1987 - 88
Mingalpur (2)	1987 - 88
Rajpur	1987 - 88
Gandhipura	1993
Raissangadh	1991
Panchi	1991
Hebatpur	1993
Madha pura	1987 - 88
Ratanpura	1994
Umargadh	1994
Zonkhi	1987 - 88
Sodhi	1994
Rahatalav	1987 - 88
Bhangadh	1987 - 88

APPENDIX # 9

Technical Background of Lined Ponds

It is important to understand the basic technical component of the lined pond. The construction of the lined ponds is divided into eight parts: (Barot, 1992)[1]

(1) *Site Selection and Excavation*
Several factors must be taken into consideration when attempting to chose an appropriate site for the lined pond. First, the soil must have a lower concentration of salt. Second, it must not be constructed near a groundwater source which is close to the surface. Third, there must be appropriate amounts of run off water in order to fill the pond during the monsoon. The fourth consideration is very important because it involves the participation of the community in selecting an appropriate location.

(2) *Site Preparation (Slope Making)*
Agrifilm provides an effective seepage barrier for the ponds. Agrifilm[2] lining is placed on the slopes of the reservoir. These slopes must allow soil placed on top of it to remain in position. There was careful consideration by the engineers and consultants as to the amount of slope permitted for proper construction of the ponds. Agrifilm on the side slopes should be covered with brick lining while the agrifilm on the bed of the pond should be covered with thirty centimetres of soil in order to protect it from sunlight. The soil excavated from the base can be used to build up the bank of the reservoir. Any rocks or other projections which might damage plastic sheet must be removed. Firm compaction of the base and side slope is important.

(3) *Sump Channel*
A fifty centimetre deep and thirty centimetre wide brick towel with one to three ratio cement masonry was constructed all around the bed of the reservoir to support brick lining at side slopes in the first seven village ponds. The brick towel was replaced by a sump channel which is required at the bed level on the edge of the pond bottom in order to enable emptying of pond. One edge of this sump channel will work as a toe wall. A toe wall is constructed around the bed of the reservoir in order to provide support to the side slopes.

A sump channel is half a metre deep and half a metre wide around the pond bottom. Sump pits of one metre in length and one metre deep are also provided at the four

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[1] Refer to Appendix 8.

[2] Agrifilm is a type of plastic sheet which is available from IPCL in Baroda. Agrifilm is available in different sizes and thickness depending on the water pressure.

corners. This sump channel also works as towel and enables deying of polyethylene from bed as well as slope.

(4) *Agrifilm Laying*
The success of any reservoir project depends upon the careful installation and joining of agrifilm. Wind free conditions are required in order to lay the agrifilm.

(5) *Agrifilm Sealing*
Adjacent sheets should be placed and joined by either heat sealing of seal adhesive tape. Agrifilm should be placed lengthways down the slope in order to avoid stress on the cross joints during installation. Agrifilm absorbs the heat from the soil which causes it to expand. Under very hot conditions, agrifilm laying and joining work should be done in the early morning or evening. However, during cold weather a certain amount of slackness should be allowed in order to compensate. Any puncture caused accidentally during installation or in any situation should be fixed immediately.

(6) *Soil Cover & Brick Lining*
Thirty centimetres of uniform soil should be provided over the agrifilm in the bed. This soil should not be hard or coarse. Agrifilm on the side slopes should be lined with single bricks. Toe walls should be constructed every ten metres as a part of the brick lining at the side slope. The brick lining on the side slopes should be properly supported on the sump channel wall. Necessary arrangement of inlet and the outlet pipe should be provided. Agrifilm anchored at the top of the embankments should be covered with brick lining up to at least one meter widthways all around the reservoir top. The brick lining on the side slope should be cured for three days. An inlet channel with gates should be constructed to divert water from the catchment area into the pond.

(7) *Outlet System*
An outlet pipe is laid from the pond to the filter system. Water comes into the filter tank by gravitational flow and passes through the filter bed. This water from the storage sump is then pumped out by means of a hand pump.

(8) Filter System
The filtration of water is done by a slow sand filter. This filter consists of different layers of fine sand (0.1 - 0.3 mm), coarse sand (0.3 - 1.0 mm); graded gravel (1.6 - 2.0 mm) and big graded gravel (20 - 40 mm). Water passes through all these four layers, flows into the perforated pipe, presses the float valve and comes into the storage tank. This filtered water can be pumped out by a handpump and used for drinking[3].

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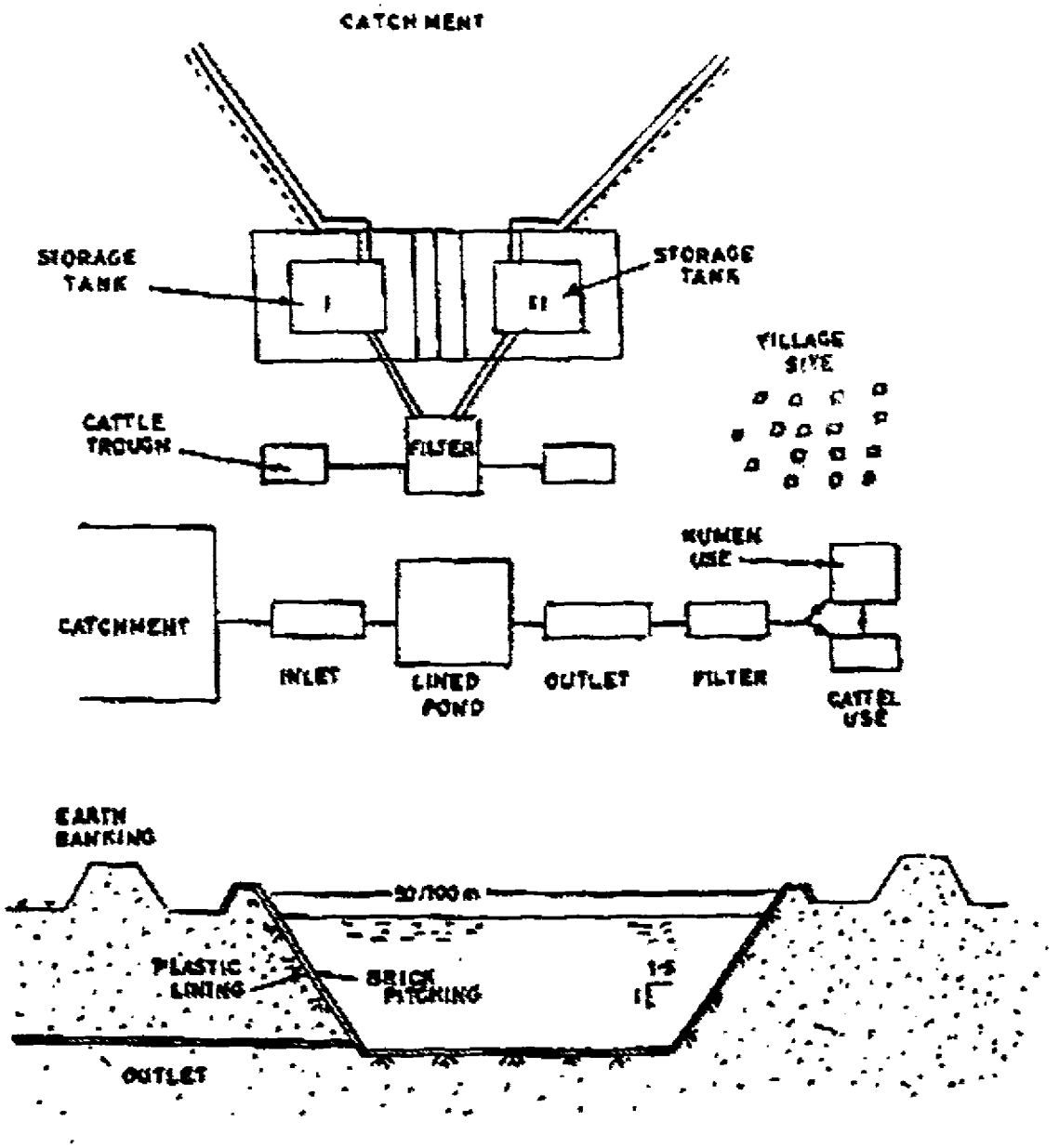
[3] Refer to Appendix 9.

Appendix 10

Schematic Diagram of a Lined Pond



Appendix 11

Handpumps attached to Lined Pond

Handpump Training Session

Kamatalav (1995)

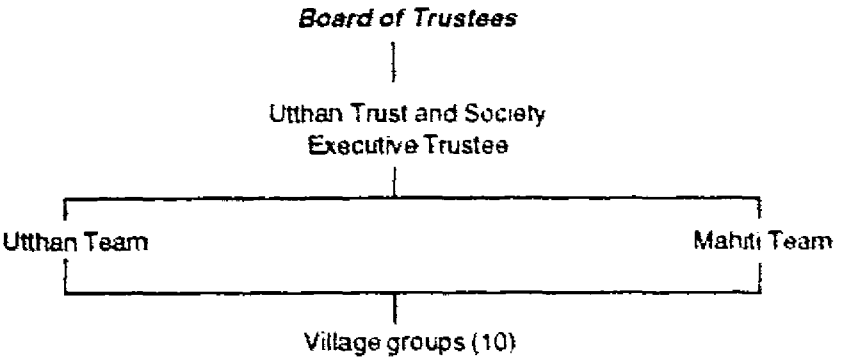
Village alternative to broken handpump

Rajpur (1995)

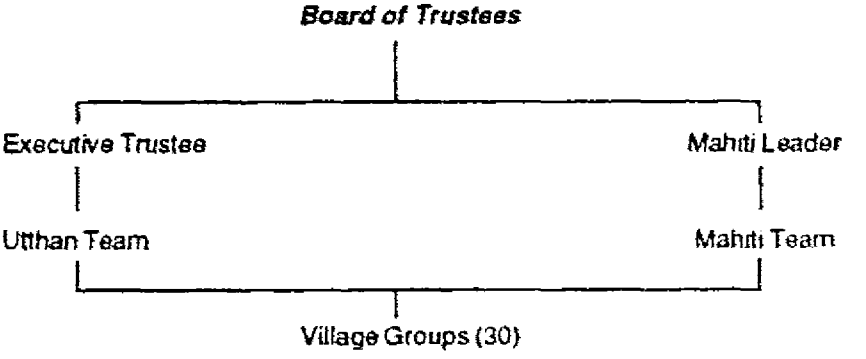
Appendix 12

Organizational Chart of Utthan and Mahiti

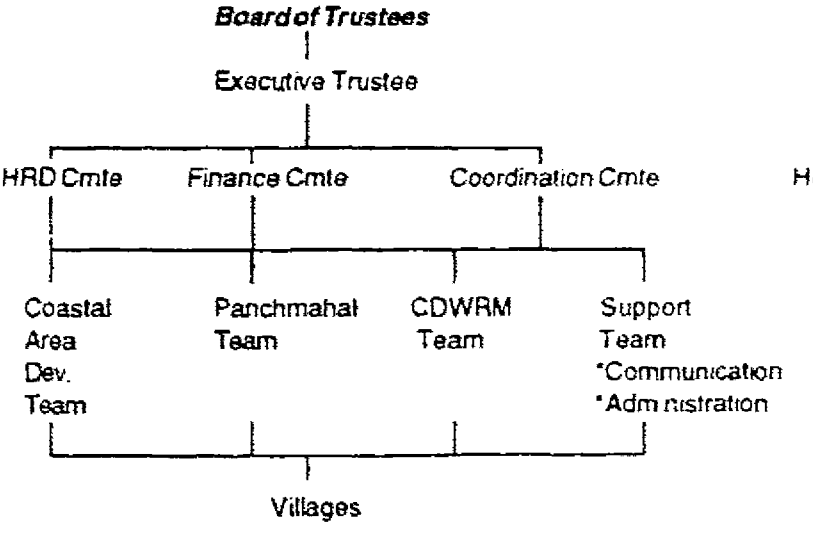
1981 to 1989

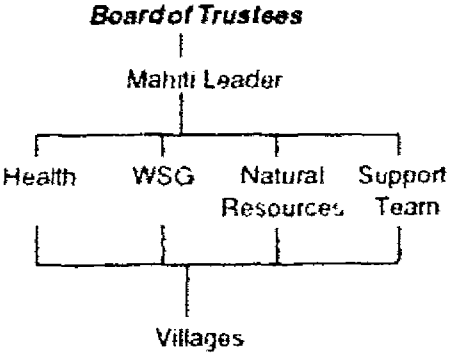


1989 to 1994



August 1994





Appendix # 13

Research Paradigms

Over the centuries, the traditional (i.e. dominant, mainstream, classical or orthodox) research paradigm was the most common type of research. Social science research followed the traditional paradigms with an emphasis on positivist approaches which are considered to be deductive, objective and use quantifiable approaches to data collection. This approach gained its credibility through an ability to provide statistical answers to questions, replicability of the research and objectivity.

Another component of the traditional research paradigm is the researcher's ability to control the research question as well as the methodology. The people are viewed as objects that have no voice in the research. The results are difficult for the subjects to understand if they are even able to gain access to the reports.

Traditional research works within the present structure without contesting the status quo. The result of this research does not empower the people, promote action towards change or raise critical awareness amongst the oppressed.

Maguire (1987) refers to traditional research as a paradigm as opposed to an approach because it is a "constellation of theories, questions, methods and procedures that share central values and themes" (Maguire, 1987: 11-12). The alternative research paradigm developed counter to the dominant research. The alternative paradigm emerged as a means to interpret and change reality as well as to challenge mainstream society.

The alternative research paradigm includes oral histories, PRA surveys, participatory and feminist research approaches. This paradigm focuses on qualitative aspects of human development and most of the work in this area concentrates on the local level while the information collected is difficult to measure (i.e. empowerment). Participatory Rural Appraisals (PRAs) are used as an alternative to traditional research. Community organizers work with a group of villagers as they participate in information collection, project planning or evaluation of a development project. PRAs are commonly used as a research technique, especially by community organizers.

Participatory research approaches decentralize knowledge and power, empower grassroots movements and lead more directly to concrete results than positivist research (Shook, 1993: 14). Maguire (1987) explains participatory research as having three levels; investigation, education and action. The important aspect of participatory research is it's collective process over which the people have control (Tandon, 1981:25).

Social science research should allow the process of enquiry to lead towards awareness and a better understanding of the issues. This knowledge and information should be brought back to the community or group through the research. The research in this practicum followed this basic assumption.

Utthan's work is participatory and grassroots which indicates that this research should also follow this process. It was decided that the researcher would work with a team of Utthan, Mahiti and CDWRM members. The team consisted of Utthan's Executive Trustee, CDWRM's co-ordinator, documentation and communication co-ordinator, Mahiti leader, Mahiti's senior staff and their water committee. Each individual was involved with the drinking water initiatives at a different capacity.

Appendix # 14

Criteria for Village Selection

	Mingalpur	Rajpur	Anandpura	Kamatal av	Navagam Kama
Year of lined pond construction	1987	1987	1992	1992	1992
+/- Village management of lined pond	-	+	-	-	+
Community organizer	+	-	-	+	+
Mahila Mandal	+	+	-	+	+
Water Committee present in village	-	+	+	+	+

Appendix # 15

DESCRIPTIVE PHASE FOR FIVE VILLAGES IN THE BHAL

	RAJPUR	ANANDPURA	KAMATALAV	NAVAGAM KARNA	MINGALPUR
Migration	High percentage of migration leaving the old and very young. Many of the homes are closed. The village has no power, roads or water. There are few opportunities for employment in the village.	Migratio is low. Diamond polishing machines are found in the village. Power and roads are available which make access to other villages easier.	Migration is seasonal. Diamond polishing machines are found in the village which employ some people. Tension between old and new generation as the migrants return to their village with new ideas from the urban centres.	Migration is seasonal. Potential tension between old and new generation as the migrants return to their village with new ideas from the urban centres.	Migration is seasonal. Tension between old and new generation as the migrants return to their village with new ideas from the urban centres.

	RAJPUR	ANANDPURA	KAMATALAV	NAVAGAM KARNA	MINGALPUR
Resource Mobilization **a. Human** **b. Financial**	a. Women are involved, enthusiastic and participatory in the village's development (i.e. lined pond and mandal). Men are supportive of the women. The men assist in the lined pond construction, maintenance and management. b. Women's credit program stemmed from the lined pond initiative. Women are aware of government structures and opportunities to receive funding. They have loan from FWWB.	a. Very few women are involved in the water committee. Men are active on the committee. b. Women began a credit program but it collapsed after the first year.	a. Women are involved, enthusiastic and participatory in the village's development. They include women of all ages into their mandal. Some men are supportive and assist in the maintenance and management of the lined pond. b. Women's group developed in order to address the drinking water problem and the credit situation in the village. The women's group has credit. They are registered and receive loans from FWWB. They are involved in income generating activities.	a. Women are involved, enthusiastic and participatory in the village's development. They include women of all ages into their mandal. Some men are supportive and assist in the maintenance and management of the lined pond. b. Women's group is registered and they have a savings and credit program. They are aware of options to receive loans and they are considering extending their work into income generating activities.	a. Women are involved and participatory in the village's development. However, they are discouraged by the lack of response by the rest of the village. b. Women's group is registered and receives loans from FWWB. They have received subsidies for other initiatives (ie biogas, sanitation). This mandal supported and advised other mandals about organizing and funding options.

	RAJPUR	ANANDPURA	KAMATALAV	NAVAGAM KARNA	MINGALPUR
Resource Mobilization c. Other Initiatives	Women's group supported the village health program which developed after the lined pond was constructed. Women are involved in the area resource group for the Bhal.	Health program did develop through the lined pond initiative and the mandal's activities; water committee is involved in the area resource group for the Bhal	The women's group supported the village health program, marketing of seeds, and the area resource group in the Bhal.	The women's group supported the village health program; marketing of seeds.	The women's group supported the village health program, biogas, sanitation, organized shibirs, nonformal education, marketing of seeds; and the area resource group for the Bhal.
Relationship to Community Organizer and Voluntary Organization	A community organizer was *not present from* October 1994 to August 1995. Mahiti's Health Worker visits the village once every couple of months. Every month, the women go to Ahm'd with Mahiti to meet with FWWB. The women attend meetings and workshops at Mahiti Centre.	There is little community *organizing in this village* because there are a lot of overwhelming social problems. The engineer for CDWRM has good a relationship with the men on the water committee.	The community *organizer is active in this* village. A Mahiti staff member who was dismissed from service lives in this village. There is some resistance and problems from this person and his and his family towards the community development initiative.	The community *organizer is active in this* village. A new community organizer began working in this village over the past two years. A Mahiti community organizer who was dismissed has returned to cause problems in the village. Village respects Mahiti and wants to continue working with them.	The community *organizer is active in this* village. The leader of Mahiti lives in the neighboring village. These two villages often work together.

	RAJPUR	ANANDPURA	KAMATALAV	NAVAGAM KARNA	MINGALPUR
Women's involvement	Women's group works together on various issues. Women are not afraid to stand up to each other or to other community members. Some women in the village resigned after the mandal began a savings and credit group. These women still support the mandal's activities. Women are very involved with the lined pond (construction, maintenance and management).	Women are not organized into a group. Some women work alone to manage the lined pond. Women do not have alternatives (i.e. place to wash or bathe).	Women's group works together on various issues. New women in the village are welcomed into the group. Women are very active with the lined pond initiative and its future. Community organizer tried to involve lower caste women but with little success.	Women's group works together on various issues. Women are making decisions about the future activities of the group. Women very involved in all stages of the lined pond initiative from site selection to handpump training to the water committee. Entire village does not take responsibility for the lined pond, leaving the mandal to manage it.	The women's group works together on various issues. Women are frustrated and tired of the constant struggle with the village. Women are very involved in all stages of the lined pond initiative. Women assisted other villages who wanted to start a mandal. They provided support and guidance.

	RAJPUR	ANANDPURA	KAMATALAV	NAVAGAM KARNA	MINGALPUR
Interrelation-ship	Rely on Mingalpur for provisions and some boys work in this village. The village of Bavalea is a neighboring village. There are a number of darbars in this village. These darbars caused a lot of problems for this village and the women when they started to organize around their drinking water problems. In 1995, the women of Bavalea asked the Rajpur mandal to assist them start their own mandal. The women are involved with FWWB through loans and meetings. The women are involved in the area resource group for the Bhal.	The village watched films made by Utthan and Mahiti about the women's groups and the lined pond construction (i.e. Water - Not Mirage). They were able to see examples of initiatives in other villages . The water committee is involved with the area resource group. This group is predominantly men. There are numerous problems with the management of the lined pond. The men's involvement with the ARG allows them to learn from other villages and the women.	Some of the members from the mahila mandal are originally from other villages. They bring experiences and ideas from their homes to their new village. For example, one woman is from Khun, a few km away, and Mahiti worked in this village. The village watched films made by Utthan and Mahiti about the women's groups and the lined pond construction (Water - Not Mirage). The women are involved with FWWB through loans and meetings Women are very interested in the area resource group for the Bhal.	Women started a mandal because Utthan and Mahiti team showed them examples of the work done by Mingalpur, Rajpur and Khun mandals. The village watched films made by Utthan and Mahiti about the women's groups and the lined pond construction (Water - Not Mirage). The water committee and the women's group are involved in the area resource group for the Bhal.	The women's group assisted other villages to establish mandals and address their drinking water shortage. The women organized workshops for other villages. The women receive loans from FWWB.

	RAJPUR	ANANDPURA	KAMATALAV	NAVAGAM KARNA	MINGALPUR
Community Dynamics	There are minor conflicts within the village. People are able to work together in order to address their social problems.	There are serious internal problems within the village. People are unable to put personal problems aside.	Village divided into two groups due to differences over lined pond site selection. The problems increased when one of Mahiti's community organizers was dismissed.	Village is separated into various communities. Village divided during the construction of lined pond. There was a problem determining labour.	The population is very large which makes it difficult to address all the concerns. The village believes the lined pond is the responsibility of the mahila mandal.

	RAJPUR	ANANDPURA	KAMATALAV	NAVAGAM KARNA	MINGALPUR
Water Situation	Pipeline does not provide water. Village talavs are dry in Febraury. There is a very serious need for water. Before the lined pond, people had to walk or use carts from five to ten kilometres in search of water. The village is able to survive throughout the summer months due to the lined pond.	Pipeline provides water for drinking. When there is no water available, they go to neighboring villages or the lined pond. Talav water is used for washing. The water is salty and non-potable. Lined pond is only used for drinking when extremely urgent.	Pipeline water is sporadic but it comes often enough that they are able to use this water for drinking. Talavs are used for washing. Lined pond is used for washing and handpumps were recently installed. Further distance from village. Talavs have Gods and Goddesses watching over them so people will obey rules in order not to upset them.	Pipeline does not provide water for the village. Talavs were repaired 15 years ago by the government. During the summer months, wells are dug in order to collect the remaining water. Step well located about 2 km outside of the village. There is always water in the step well and it is used by the surrounding villages. Lined Pond is used during the summer months. Some of the villagers believe that the responsibility of the lined pond belongs to the women.	During the summer months, the pipeline water is rarely ever available. The village may go 10 days without a drop of water. There are two village talavs. One is dry in February while the second talav is used for everything. There are two lined ponds. One lined pond is used for all purposes and the water is very dirty. People stole bricks and plastic from this pond. The second lined pond is used during the summer months. A community guard is paid to watch the pond and ensure that it is not misused.

	RAJPUR	ANANDPURA	KAMATALAV	NAVAGAM KARNA	MINGALPUR
Process	Lined pond was constructed during the first phase in 1986 and 1987. The mahila mandal organized on its own and approached Utthan and Mahiti for assistance. Utthan and Mahiti worked closely with the people of Rajpur. The population is small and the situation is desperate so people were eager to help. Site selection was not difficult. A location was determined next to the talav. The entire village assisted in the construction of the lined pond The village worked well together and an official water committee was unnecessary	Lined pond was constructed during the second phase (1992 and 1993). Utthan and Mahiti started to organize the village and then began the lined pond initiative. The mahila mandal was not strong or well established so it was unable to support the lined pond process. Site selection was difficult because there was very little available land. The final site was across the road and through a farmer's field. Village wanted to build a pipeline from the pond to the village. They were unsuccessful because they were unable to organize and raise money	Lined pond was constructed during the second phase (1992 and 1993). Mahila mandal was organized and supportive of the lined pond initiative. Several of the men were eager to have the lined pond because they saw the economic benefits. There was conflict between two groups in the village. The problems focused on two aspects, site selection and the filter. The water committee comprises of men and women from the village Handpump training session in March 1995 Awareness program organized for this village	Lined pond was constructed during the second phase (1992 and 1993). Mahila mandal was organized and supportive of the lined pond initiative. The women selected the site for the lined pond. There were difficulties in determining labour from the village. The final solution was to use tractors in order to finish the constuction of the lined pond before the monsoon. Village worked together to strengthen and reinforce the walls in the pond (June 1995). Water committee is made up of men and women in an attempt to balance the responsibilities and ownership of the pond	Lined ponds were constructed during the first phase (1986 and 1987). Mahila Mandal was organized and supportive of the lined pond initiative. There was conflict between the mahila mandal and Sarpanch regarding community development. Site selection was difficult because the Sarpanch had his own agenda which conflicted with the village. The people dug where they felt was the best location. Village hires a community guard during summer months who protects the pond. There are several men in the community who assist with the ponds

Appendix 16

Women Collecting Water

Kamatalav (1995)

APPENDIX # 17

INTERPRETATION PHASE

Village	Economic Aspects
Rajpur	* Migration is a big issue and concern for the village. * Employment in village is low. No power so unable to have a mill or factories (diamond polishing). No roads which makes is difficult to get provisions. Must rely on Mingalpur for provisions and mill. * Practical needs - health program has increased their access to health care (2 health workers trained by Mahiti). Lined pond provided short term employment for women and men. * Entire community benefits from the lined pond. * Women have control over resources (water, health, visits to Ahm'd). They have a savings and credit cooperative which gives them access and control to credit. * Entire village responsible for management of water systems which are followed by rules and regulations.
Anandpura	* Migration is low. * Practical needs - women do not have equal control over resources. Water and health care are addressed. There was a mahila mandal but the women discontinued the meetings and the money was distributed among the members. * Community benefits from water if it is managed properly. * Environmental economics may be an interesting approach to intrigue other members of the community to participate in the water initiatives.
Kamatalav	* Chana, cotton, wheat are the crops in this village. * There is a mill in the village which is operated by a woman. * There is diamond polishing equipment in the village. * Migration is a relatively new issue for the village. * Practical needs - health worker; lined pond which women control and manage. The women find it difficult to get the entire village to take responsibility. A savings and credit cooperative gives women access and control over credit removing their dependence on the darbars. * Community benefits from the lined pond but they do not use it on a regular basis.

Village	Economic Aspects
Navagam Karna	* Migration is low although 80 percent of the young boys participate in diamond polishing outside of their village. They travel to neighbouring villages. * There are several diamond polishing machines in the village. * The villagers were busy with their crops during the construction of the lined pond and were unable to work with this project. The pond was dug by tractors because there was not enough labourers. * Cotton, wheat, chana, jowar (millet) are the crops in the village. * Practical needs - health worker; lined pond which women control but they find it difficult to get the rest of the village to take responsibility for the water systems. The women have a savings and credit cooperative which gives them access and control over credit. They do not have to be as reliant on the darbars for credit. * Each family owns some land.
Mingalpur	* Migration is seasonal. * There are several shops, diamond polishing machines and a flour mill in the village. * Practical needs - two health workers; lined pond; biogas; and sanitation. * In December 1989, five women migrated alone in order to prove their independence as well as control over their labour. * The savings and credit collective allows women to have access and control over credit.

Village	Environmental Aspects
Rajpur	* The groundwater table is high and salty. * The soil has a high salinity content. * There is no vegetation in the area because the soil is saline and there is limited amounts of water. * Extreme conditions from drought to flooding in the area. * Wasteland surrounds the village. * Camels eat the mangroves growing along the coast resulting in deforestation, erosion and sea ingress. * Sea ingress is common along the coastline. The last serious incident occurred in November 1993. * The lined pond must be cleaned on a regular basis. In 1995, the water in the pond was extremely dirty resulting in the village boiling the water for May and June. * In the future, villagers want to see trees growing around the water sources.
Anandpura	* The groundwater table is high and salty. * The soil has a high salinity content. * There is no vegetation in the area because the soil is saline and there is limited amounts of water. * Extreme conditions from drought to flooding in the area. * Wasteland surrounds the village. * Camels eat the mangroves growing along the coast resulting in deforestation, erosion and sea ingress. * Sea ingress is common along the coastline. The last serious incident occurred in November 1993. * The lined pond must be cleaned on a regular basis. In 1995, the water in the pond was extremely dirty resulting in the village boiling the water for May and June. * In the future, villagers want to see trees growing around the water sources.

Village	Environmental Aspects
Kamatalav	* The groundwater table is high and salty. * The soil has a high salinity content. * There is no vegetation in the area because the soil is saline and there is limited amounts of water. * Extreme conditions from drought to flooding in the area. * Wasteland surrounds the village. * Camels eat the mangroves growing along the coast resulting in deforestation, erosion and sea ingress. * The lined pond must be cleaned on a regular basis. * In the future, villagers want to see trees growing around the water sources.
Navagam Karna	* The groundwater table is high and salty. * The soil has a high salinity content. * There is no vegetation in the area because the soil is saline and there is limited amounts of water. * Extreme conditions from drought to flooding in the area. * Wasteland surrounds the village. * Camels eat the mangroves growing along the coast resulting in deforestation, erosion and sea ingress. * The lined pond must be cleaned on a regular basis. * In the future, villagers want to see trees growing around the water sources.
Mingalpur	* The groundwater table is high and salty. * The soil has a high salinity content. * There is no vegetation in the area because the soil is saline and there is limited amounts of water. * Extreme conditions from drought to flooding in the area. * Wasteland surrounds the village. * Camels eat the mangroves growing along the coast resulting in deforestation, erosion and sea ingress. * Sea ingress is common along the coastline. The last serious incident occurred in November 1993. * The lined pond must be cleaned on a regular basis. * In the future, villagers want to see trees growing around the water sources.

Village	Political Aspects
Rajpur	* The Sarpanch is responsible for two villages and he lives in the neighbouring village which has a strong darbar community. * Some of the women in Rajpur plan to run for Panchayat positions during the next election. * The women are very self-confident and vocal in their families and during group meetings. * Strategic needs - women receive respect from men. Women are able to travel with Mahiti to the centre for workshops or to the city for meetings. Men help with the management of water systems. Women are well organized and support each other. These women make their voice heard in their village and area (e.g. women argued the importance of village cooperation during and ARG meeting).
Anandpura	* The Sarpanch is responsible for two villages. For the first time, a person from Anandpura is running in the Panchayat elections. The village is very excited about the prospect of the Sarpanch living in their village. * Darbars live in the neighbouring village. * Strategic needs - women's needs are not met at this point. They are not organized although some do work on community issues independently.
Karnatalav	* The Sarpanch lives in the village and he is very dynamic and a positive element in assisting change within the village. * Women are gaining respect in the village and households. The Sarpanch is positive about women's role within development and potentially within the Panchayat. * Strategic needs - Women are slowly receiving respect and recognition from the men. Women are well organized and a strong support for each other.
Navagam Karna	* The Sarpanch lives in the village but his term ended and the elections will determine a new Sarpanch. Some women want to run for this position. * Strategic needs - women work together although there is a division within the mandal over the future plans of the group. Women do support each other and receive respect within the village. They speak up for their needs.

Village	Political Aspects
Mingalpur	* The Sarpanch lives in the village and he has his own agenda which conflicts with the mandal. He is threatened by women and their initiative to promote change for their entire village. * Strategic needs - the women work together and support each other (example for fight against darbar). Assist other villages with lined pond and formation for mandal. Use "informal agenda" to achieve strategic needs with men and other community members.

Village	Social Psychological Aspects
Rajpur	* Community is "homogenous" (one caste and religion) * Women are very aware of the issues and alternative approaches to address problems and conflict. They address government, NGOs, researcher and husbands in different manners depending on each informal agenda. * This village suffers from extreme environmental, social and political conditions. The women are extremely strong, outspoken and independent.
Anandpura	* The village is made up of a variety of castes. * The women are discouraged and disempowered. They do not want to be a part of the water committee due to internal social problems and male/female relationships. * Men maintain control over women's participation in community development initiatives.
Kamatalav	* This village is mostly Koli Patel with a few Harijan families. * It took time and patience to develop trust between my self and the women. When the community organizer worked with me, the people felt comfortable to talk openly. * There are some very strong , dynamic and hardworking women who believe that when the community is organized, they can resolve some of their problems (i.e. sanitation). * The older women are suspicious and sometimes not helpful in answering questions. * There is tension between the old and new generation due to migration and new attitudes from the city.

Village	Social Psychological Aspects
Navagam Karna	* Village is mostly Koli Patel with a few other castes. * A Mahiti staff who was dismissed used to be the community organizer in this village. There are a lot of questions as well as confusion about his dismissal from Mahiti. He also visited the village and spread rumours to stir trouble. * One particular woman is very controlling. Mahiti is very careful around her; she must remain on their side or nothing will get done. She has a lot of informal power within the village.
Mingalpur	* Population is large and village is made up of a variety of castes with Koli Patel as the majority. * The mahila mandal supported other villages and women, especially Rajpur. * Willing to share their experiences with everyone. The mandal is going through some difficulties and low morale. * It is important to remember that Mahiti's leader lives in eh next village. These two villages work together towards social and environmental change in the area.

Village	Sociological Aspects
Rajpur	* Village is not influenced by mainstream media (Hindi films and tv). Entertainment includes social visits with tea, folk songs and dance. Religion is integral part of their lives. * Women's participation occurs at all levels. The women initially contacted Utthan and Mahiti for assistance and support. * The entire village is very positive and grateful for the water that hey have form the lined pond. * There are no women actively involved in the water committee or community organizing.

Village	Sociological Aspects
Anandpura	* When older men are present, the women cover their faces and become very quiet and reserved. * The village is multicaste with mostly Koli Patels. * Project success - some people are very glad to have the lined pond while other show fvery little interest. Several members on the water committee had never been to the lined pond. * There are no women actively involved in the water committee or community organizing.
Kamatalav	* Mainstream media has a large impact on the village. There is a community television where many community members watch the Hindi soap operas. This resource provides a social outlet but limits communication. * Women's participation is present at all levels of community development. * There is a combination of age groups within the mandal. Women are involved in a number of activities including savings and credit; seed marketing; health; ARG and sanitation in their village. * Project success - the village is glad to have the lined pond but they do not manage it properly. * Village is divided into two definite communities. The internal problems have escalated, especially situation has increased over the past year as a Mahiti staff member was removed from service with the organization. This staff member is a resident o Kamatalav. * Women uphold tradition by covering their heads to show a sign of respect for elder men.
Navagam Karna	* Women participate at all levels, especially during the site selection and management of the water system. * Project success - the village does not manage lined pond because a large percentage of the village believe that the pond is the responsibility of the mahila mandal. * The community is divided which affects the mahila mandal. * The awareness programme was very important because it gave people (men and women) an opportunity to discuss their views about the village water systems.

Village	Sociological Aspects
Mingalpur	* Women participate at all levels, especially during the site selection and management of the water system. * Project success - the village does not manage lined pond because a large percentage of the village believes that the pond is the responsibility of the mahila mandal. * This village has a large population and there are conflicts between the mahila mandal and the Sarpanch. * This mahila mandal began in 1985 as a savings and credit group. In 1986, the lined pond was constructed and women were involved in all stages of the process. Women are also involved in social forestry, health, biogas, sanitation and women's workshops.

BIBLIOGRAPHY

Ahmed, Sara, "Women's Role in Natural Resource Management," to be published, Institute of Rural Management (Anand), Anand, 1995.

Ahooja-Patel, Krishna, "Women and Development: The International Dimension," Saint Mary's University Working Paper No. 93.6, Halifax, 1994.

Assad, Marie, Samiha el Katsha and Susan Watts, "Involving Women in Water and Sanitation Initiatives; an Action/Research Project in an Egyptian Village," Water International, Vol. 19(3), September 1994, pp. 113 - 120.

Barot, Nafisa, "Alternative Source of Drinking Water: The Mahiti Experience," Ahmedabad, 1993.

Barton, Tamsyn, Progress of Community Participation Activities in Karnataka Drinking Water and Sanitation Projects in Raichur and Bellary Districts, An Interim Report for Actionaid India, Bangalore, July 1994.

Beck, Tony, Literature Review of Social Gender Indicators, CIDA document, Asia Branch, Ottawa, 1994.

Bhasin, Kamla, What is Patriarchy? Raj Press, New Delhi, 1993.

Bhasin, Kamla and Nighat Said Khan, Some Questions on Feminism and its Relevance in South Asia, Raj Press, New Delhi, 1986.

Bhatt, Mihir R., "Linking development with disaster relief," Times of India, Ahmedabad, February 7, 1994, p. 7.

Bhatt, Mihir R., "Sea adds to Dhandhuka's misery," Times of India, Ahmedabad, December 16, 1993, p.5.

Bhatt, Tushar, "Bhal women show the way," Sunday Times of India, Ahmedabad, June 5, 1994, p. 20-21.

Conway, Eileen and Yianna Lambrou, "Gender and Development: Equity for All," in Gender Equity: IDRC Reports, Ottawa, Vol. 23(2), July 1995, pp. 4-7.

CWRM, Proposal for Supply of Drinking Water through Community Managed Lined Ponds in Saline Rural Areas, Ahmedabad, n/d.

CWRM, Proceedings of the Seminar on Dynamics of Drinking Water in Rural Gujarat, Utthan, Ahmedabad, June 9, 1994.

Damji, Shaiza, Management of Household Economy: A Case Study of Raissannggadh and Navagam Karna in Dholera, Unpublished report for Utthan and Mahiti, Ahmedabad, 1992.

Devaraj, A., "Integrated Rural Sanitation and Water Supply Project: Community Participation in Non-Conventional Energy Based Water Supply Project," Proceedings of the Community Participation in Drinking Water and Sanitation Activities Conference, Bangalore, December 1995.

Express News Service, "Narmada Water to be sold to industries." Times of India, Ahmedabad, June 10, 1994, p. 8.

Freire, Paulo, Pedagogy of the Oppressed, Seabury, New York, NY, 1970.

Government of Gujarat, Master Plan for Dealing with the Drinking Water Scarcity (1991-92), Water Supply Wing: Department of Health and Family Welfare, Ahmedabad, November 1991.

Gupta, SK and P. Sharma, "Water Scarcity and Environment Problems in Gujarat: An Approach to their Solution," Proceedings from the Water Problems of Gujarat: Approaches to Solutions workshop, Ahmedabad, January 1995.

Hirway, Indira, William Critchley and Anil Bhatt, An Innovative Approach to Rural Development: Assessment of Mahiti, Report for Aga Khan Foundation (India), Ahmedabad, December 1988.

Jose, P.D., "Participative Management of Development Programmes," Journal of Rural Development, Vol 13 (4), 1994, pp. 515-25.

Manikutty, S. and Dileep Mavalankar, Study on Community Participation in Rural Water Supply and Sanitation Projects, Report for UNDP/WB Water and Sanitation Programme, Gujarat, 1995.

MacLean, Melissa, Health and Empowerment: Mahiti's Community Health Activities in the Bhal, Unpublished report for Utthan and Mahiti, Ahmedabad, 1994.

Mahiti, "Six month progress report. (Jan-June 1994)," Internal Document for Mahiti, Ahmedabad, 1994.

McIntyre, Fiona, Social Afforestation in the Bhal Region, Unpublished report for Utthan and Mahiti, Ahmedabad, 1994.

Moench, Marcus, Susan Turnquist and Dinesh Kumar (eds.) Proceedings of the Workshop on Water Management: India's Groundwater Challenge, VIKSAT, Ahmedabad, December 14-16, 1993.

Moser, Caroline, "Gender Planning in Third World," World Development 17(11), 1989, pp. 1799-1825.

Munro, Miranda, "Ensuring Gender Awareness in Planning of Projects," in Gender Awareness of Project Planning and Evaluation, 1991.

Narayan, Deepa, Participatory Evaluation: Tools for Managing Change in Water and Sanitation, World Bank Technical Paper# 207, World Bank, Washington, 1993.

Oakley, Anne, Sex, Gender and Society, Gower Publishing Company, Aldershot, UK, 1987.

O'Hearn, S., Utthan and Mahiti: Who are We? Internal Document for Utthan and Mahiti, Ahmedabad, 1995.

OM Consultants (India) Pvt Ltd., "Local Level Institutions in Drinking Water and Sanitation Projects: Some Experience from Karnataka," Proceedings from the Community Participation in Drinking Water and Sanitation Activities Conference, Bangalore, December 1995.

Patel, P.P., Drinking Water Problem of Bhal Area in Gujarat, Water Resources Evaluation and Scheme, University of Baroda, Baroda, October 1988.

Patel, Dr. V.J., "Total Water Resources Management in Gujarat: For Those who Care for Balanced Growth," Proceedings from the Water Problem of Gujarat: Approaches to Solutions seminar, Ahmedabad, January 1995.

Radha, T.M., "Mobilising Community Contributions through NGOs: The Experience of Two Districts in Karnataka," Proceedings from the Community Participation in Drinking Water and Sanitation Activities Conference, Bangalore, December 1995.

Rai, Usha, Against All Odds: Breaking the Poverty Trap, Panos Institute, London, U.K., 1989.

Raj, Maithreyi Krishna, Women and Development: The Indian Experience, SNDT Women's University, Bombay, 1988.

Rathgerber, Eva, "Integrating Gender in Development: Research and Action Agendas for the 1990s," Journal of Developing Societies, Vol 8, 1992, pp 213 - 220.

Reinharz, Shulamith, Feminist Methods in Social Research, Oxford University Press, New York, 1992.

Shah, Meera Kaul and Parmesh Shah, "Gender, Environment and Livelihood Security: An Alternative Viewpoint from India," ids bulletin, Vol 26(1), 1995, p. 75-82.

Shah, Rajiv, "Need to go beyond micro-level solutions," Times of India, Ahmedabad, May 9, 1994, pp. 1-2

Sreenivasan, Gauri, Giving Due Credit: Study of the Women's Savings Group in Bhangadh and Mingalpur, Unpublished report for Utthan and Mahiti, Ahmedabad, 1991.

Tamburo, Andra, Vijay Jani and HABK Project team, "Feeling the Pulse An ongoing exercise in people's participation in water." Proceedings from the Community Participation in Drinking Water and Sanitation Projects Workshop, Bangalore, December 1995.

Utthan, "Six monthly progress report (Jan-June 1994)," Ahmedabad, 1994

Utthan, "Proposal for CWRM," Ahmedabad, March 1992.

Utthan, "Women: The Power of the Bhal," Ahmedabad, 1992.

Utthan, "Rain Water Catchment Pond Lining with Agrifilm," Ahmedabad, 1987

Utthan, "Yet Another Development Plan for the Area in Red," Ahmedabad, 1983

Utthan, "First progress report of the work done from August 1992 to January 1993. Research Proposal on Drinking Water in Gujarat," Ahmedabad, n/d

Utthan, "Introduction: Water issues," Ahmedabad, n/d.

Utthan, "Programme for Helping People Develop Skills to Build and Maintain their Water Resources," Ahmedabad, n/d.

Utthan, "Report on Pond Lining Project," Ahmedabad, n/d.

Utthan, "Women and Water Resource Development: An Alternative," Ahmedabad, n/d.

Utthan and Mahiti, "Savings Report (Bachat Aheval)," Ahmedabad, 1994.

Utthan and Mahiti, " Focusing on the Real Issues," Ahmedabad, 1992.

Utthan and Mahiti, "Proposal for Core Fund (1992 - 96)," Ahmedabad, 1991.

Utthan and Mahiti, "Some Comments on the "Special" Development Plan for the Bhal Region Being Proposed by the Government of Gujarat, Ahmedabad, 1983

Utthan and Mahiti, "A Programme Aimed at Creating Awareness and Building Capacities for Development Action," Ahmedabad, n/d.

Utthan and Mahiti, "Planned Activity Note Field Guide to Social Afforestation (1982 - 83)," Ahmedabad, n/d.

Utthan and Mahiti, "Revegitation of Salt Affected Soils in Bhal Region," Ahmedabad, n/d.

Utthan and Mahiti, "The Priceless Coastal Plant: Mangrove," Ahmedabad, n/d.

Utthan and Mahiti, "Solar Distillation and Roof Water Experiments at Mahiti Centre," Ahmedabad, n/d.

Utthan and Mahiti, "Supply of Drinking Water and Development Priority in the Villages of the Bhal," Ahmedabad, n/d.

Utthan and Mahiti, "Women's Organization as a Basis for Community Development," Ahmedabad, n/d.

Venkateswaran, Sandhya, Living on the Edge: Women, Environment and Development. Friedrich Ebert Stiftung, New Delhi, 1992.

Vohra, Gautam, Altering Structures: Innovative Experiments at the Grassroots, Tata Institute of Social Sciences, Bombay, 1990.

Wieringa, Saskia, "Women's Interests and Empowerment: Gender Planning Reconsidered," Development and Change. Vol. 25(4), October 1994, pp. 829 - 848.

Wilkinson, Susan, Agents of Empowerment and Change: A Case Study of the Mahila Mandals in Bhangadh and Mingalpur Villages in Gujarat, India, Unpublished report for Utthan and Mahiti, Ahmedabad, 1991.

Wilkinson, Susan, A Community Based Approach to Development, Unpublished Report for Utthan and Mahiti, Ahmedabad, 1990.

Yashwant, Shailendra, "Harvesting Rainwater Storages in Saline Lands." The Hindu Survey of the Environment, 1994, pp. 189-191.