

**From Staying Alive to Taking Control:
Gender and Water Resources Management
in the Bhal, Gujarat, India**

by

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Abstract

In Gujarat, India, the emerging participatory Water Resource Management (WRM) policy proposes the establishment of new village-level institutions. The shift towards decentralisation is indeed welcome; however, gender has for the most part been either inadequately integrated or limited to discussion of women's formal participation in these institutions. In select rural villages of the coastal arid-saline region of Gujarat known as the Bhal, the thesis examines the implications, applications and potential contributions of women's participation in potable WRM initiatives. The case study concerns two Gujarati grassroots Non-Governmental Organisations (NGOs), *Utthan* and *Mahiti*, that have facilitated two rainwater harvesting initiatives: common property Plastic Lined Ponds (PLPs) and private property Roof Water Collection Tanks (RWCTs). Although the development initiatives are different, both the NGOs have fully encouraged an integrated gender WRM approach via village-level institutional management of local water resources.

The mainstream Gender, Environment and Development (GED) literature suggests that local participation, particularly of village women who previously had no official roles or responsibilities, can be increased by integrating women into village-level institutions which govern the water resources. However, the research in the Bhal revealed that simply integrating women into village-level WRM institutions, although beneficial, did not always achieve the dual goal of increased access to and control of water resources with gender equitable participation. Yet, in a few of the study villages, where women took collective action, they did succeed in taking a leadership role in WRM and redistributing power along gender lines. The case study demonstrates that an integrated gender component is important not only for increasing the efficiency and sustainability of water resources, but also because it provides both the context and the content of many village women's struggles.

TABLE OF CONTENTS

ABSTRACT.....	ii
LIST OF TABLES.....	vi
LIST OF FIGURES.....	vii
ACKNOWLEDGEMENTS.....	viii
1. INTRODUCTION: GENDER AND WATER RESOURCES MANAGEMENT.....	1
1.1 PROBLEM STATEMENT	10
1.2 THESIS OBJECTIVES.....	13
2. CONCEPTUAL AND ANALYTICAL FRAMEWORK:	
GENDER PARTICIPATION AND WOMEN'S EMPOWERMENT	
IN NATURAL RESOURCES MANAGEMENT.....	15
2.1 WOMEN, GENDER AND DEVELOPMENT.....	15
2.1.1 Women In Development (WID) and	
Women And Development (WID).....	16
2.1.2 Gender And Development (GAD).....	18
2.2 WOMEN, NATURE AND DEVELOPMENT.....	20
2.2.1 Ecofeminism.....	20
2.2.2 Women, Environment and Development (WED).....	23
2.3 GENDER, NATURAL RESOURCES MANAGEMENT AND DEVELOPMENT.....	24
2.3.1 Gender, Environment and Development (GED).....	24
2.4 GENDER AND WATER RESOURCE MANAGEMENT.....	28
2.4.1 Water Resource Management (WRM).....	28
2.4.2 Gender and Water Resource Management.....	30
2.5 DEFINING GENDER EQUITY, PARTICIPATION	
AND WOMEN'S EMPOWERMENT.....	33
2.6 ANALYTICAL FRAMEWORK.....	36
3. METHODS: THIRST FOR UNDERSTANDING.....	39
3.1 PARTICIPATORY RURAL APPRAISAL (PRA)	41
3.2 HOUSEHOLD QUESTIONNAIRE.....	42
3.2.1 Sampling.....	44
3.3 FOCUS GROUP DISCUSSIONS.....	45
3.4 KEY INFORMANTS.....	46
3.5 SECONDARY DATA.....	46

4. RESEARCH SETTING:	
THE BHAL, GUJARAT, INDIA.....	49
4.1 DEFINING THE STUDY AREA: THE BHAL.....	51
4.2 BIO-CLIMATIC SETTING.....	54
4.2.1 Geophysical Conditions.....	54
4.2.2 Climatic Conditions.....	56
4.3 CULTURAL SETTING.....	57
4.3.1 Caste.....	58
4.3.2 Gender Relations.....	60
4.4 DEGRADATION OF DRINKING WATER RESOURCES IN THE BHAL.....	63
4.5 DEVELOPMENT AND CONTROL OF POTABLE WATER RESOURCES.....	66
4.5.1 Historical Initiatives.....	66
4.5.2 Current Initiatives.....	68
4.5.3 Non-Governmental Organisations (NGOs).....	70
5. SEARCHING FOR POTABLE WATER	
IN A 'SALINE DESERT'.....	72
5.1 LABOUR AND SOCIAL RELATED GENDER IMPLICATIONS.....	74
5.1.1 Women's Priorities.....	78
5.2 AVAILABILITY OF AND ACCESS TO POTABLE WATER SOURCES.....	79
5.2.1 Available Water Sources.....	80
5.2.2 Access to Water Sources.....	82
5.3 COMMUNITY POTABLE WATER RESOURCE INITIATIVES.....	84
5.3.1 Common Property Resources:	
Plastic Lined Ponds (PLPs).....	86
5.3.2 Private Property Resources	
Roof Water Collection Tanks (RWCTs).....	89
5.4 USE OF POTABLE WATER SOURCES.....	91
5.5 GENDER DIFFERENTIATED PREFERENCES AND COMMON INTERESTS.....	94
5.5.1 Multiple vs. Single Use Water Resources.....	94
5.5.2 Common vs. Private Water Resources.....	95
5.6 IMPACTS OF WATER RESOURCES INITIATIVES	
AND GENDER IMPLICATIONS.....	97
5.6.1 Impact of Plastic Lined Ponds (PLPs).....	98
5.6.2 Impacts of Roof Water Collection Tanks (RWCTs).....	104
5.7 FIELD NOTES SPEAK LOUDER THAN STATISTICS.....	107
6. GENDER AND WATER RESOURCES MANAGEMENT.....	109
6.1 GENDER ROLES IN THE MANAGEMENT	
OF POTABLE WATER SOURCES.....	111
6.1.1 Management of Natural/Traditional Sources.....	111
6.1.2 Management of Modern Sources.....	114
6.2 WOMEN'S PARTICIPATION IN WRM DECISION-MAKING.....	118
6.2.1 Role of <i>Mahila Mandals</i> in WRM.....	119
6.3 GENDER ATTITUDES.....	118
6.3.1 Coastal Ahmedabad.....	119

6.3.2 Coastal Bhavnagar.....	123
6.3.3 Gender Attitudes Forming Barriers.....	127
6.4 GENDER BARRIERS TO PARTICIPATION IN <i>PANI SAMITIS</i>	128
6.5 WOMEN’S EXPERIENCES IN <i>PANI SAMITIS</i>	131
6.6 WOMEN’S IMPACT IN VILLAGE-LEVEL WRM.....	134
6.7 WOMEN TAKING CONTROL.....	136
6.7.1 Need for Women’s Common Action.....	140
7. CONCLUSIONS.....	143
REFERENCES.....	149
ACRONYMS.....	157
GLOSSARY.....	158
APPENDICES.....	159

LIST OF TABLES

TABLE 4.1	Defining the Study Areas.....	52
TABLE 4.2	Biophysical Characteristics.....	55
TABLE 4.3	Natural Drinking Water Sources in the Bhal.....	56
TABLE 4.4	Cast Distribution in Survey.....	59
TABLE 5.1	Seasonal Potable Water Sources in the Bhal Study Areas.....	80
TABLE 5.2	Benefits of PLP: Compilation of Womens' Responses.....	87
TABLE 5.3	Benefits of RWCTS: Compilation of Womens' Responses.....	90

LIST OF FIGURES

FIGURE 1.1	Gujarat, India.....	3
FIGURE 1.2	Bhal Study Villages.....	5
FIGURE 1.3	The Bhal.....	6
FIGURE 1.4	Rainwater Harvesting Systems.....	8
FIGURE 3.1	Methods.....	48
FIGURE 4.1	Drinking Water Sources in the Bhal Study Villages.....	53
FIGURE 4.2	Ranking of Village Problems by Women Villagers.....	64
FIGURE 5.1	Foregone Activities Because of Time Required to Fetch Water.....	78
FIGURE 5.2	Surveyed Households Using Various Primary Water Sources.....	92
FIGURE 5.3	Gender Preferences for Common vs. Private Water Resources.....	96
FIGURE 5.4	Litres of Potable Water Fetched/Day/Household (Coastal Ahmedabad)...	100
FIGURE 5.5	Time Taken (hr/day) to Fetch Potable Water (Coastal Ahmedabad).....	103
FIGURE 5.6	Litres of Potable Water Fetched/Day/Household (Coastal Bhavnagar).....	105
FIGURE 5.7	Time Taken (hr/day) to Fetch Potable Water (Coastal Bhavnagar).....	106
FIGURE 5.8	Village Well, Bhutashwar, Coastal Bhavnagar.....	108
FIGURE 6.1	Women's Responses: Do Women have a Role in Solving the Drinking Water Problem? (Coastal Ahmedabad)	120
FIGURE 6.2	Men's Responses : Do Women have a Role in Solving the Drinking Water Problem? (Coastal Ahmedabad).....	122
FIGURE 6.3	Women's Responses: Do Women have a Role in Solving the Drinking Water Problem? (Coastal Bhavnagar).....	124
FIGURE 6.4	Men's Responses: Do Women have a Role in Solving the Drinking Water Problem? (Coastal Bhavnagar).....	126
FIGURE 6.5	Top Reported Gender Barriers to Women's Participation in <i>Pani</i> Samiti.....	130

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1.0 Introduction: Gender and Water Resources Management

The gender imbalance between rights and responsibilities influences all rural peoples' ability to apply their ecological knowledge and constrains their efforts to provide for their families and protect the complex ecosystems on which they depend (Rocheleau, 1995:14).

In India, as in many Southern countries, there is a contemporary trend towards decentralising control over rural water resources resulting in a rise of community-based Water Resources Management (WRM) initiatives. Within the international development community and in India itself the new WRM policies being implemented work on the principle that effective management of local natural resources, especially potable water resources, requires the effective participation of individual users and user groups at the community level. It is believed that greater availability of, access to, and control over potable water can be more efficiently, equitably and sustainably managed through these newly established, non-elected, local village-level institutions. This policy shift towards decentralisation is indeed welcome; however, within natural resource planning, analysis of the gender implications has for the most part either been neglected, inadequately integrated or limited to discussion of women's formal participation in these institutions.

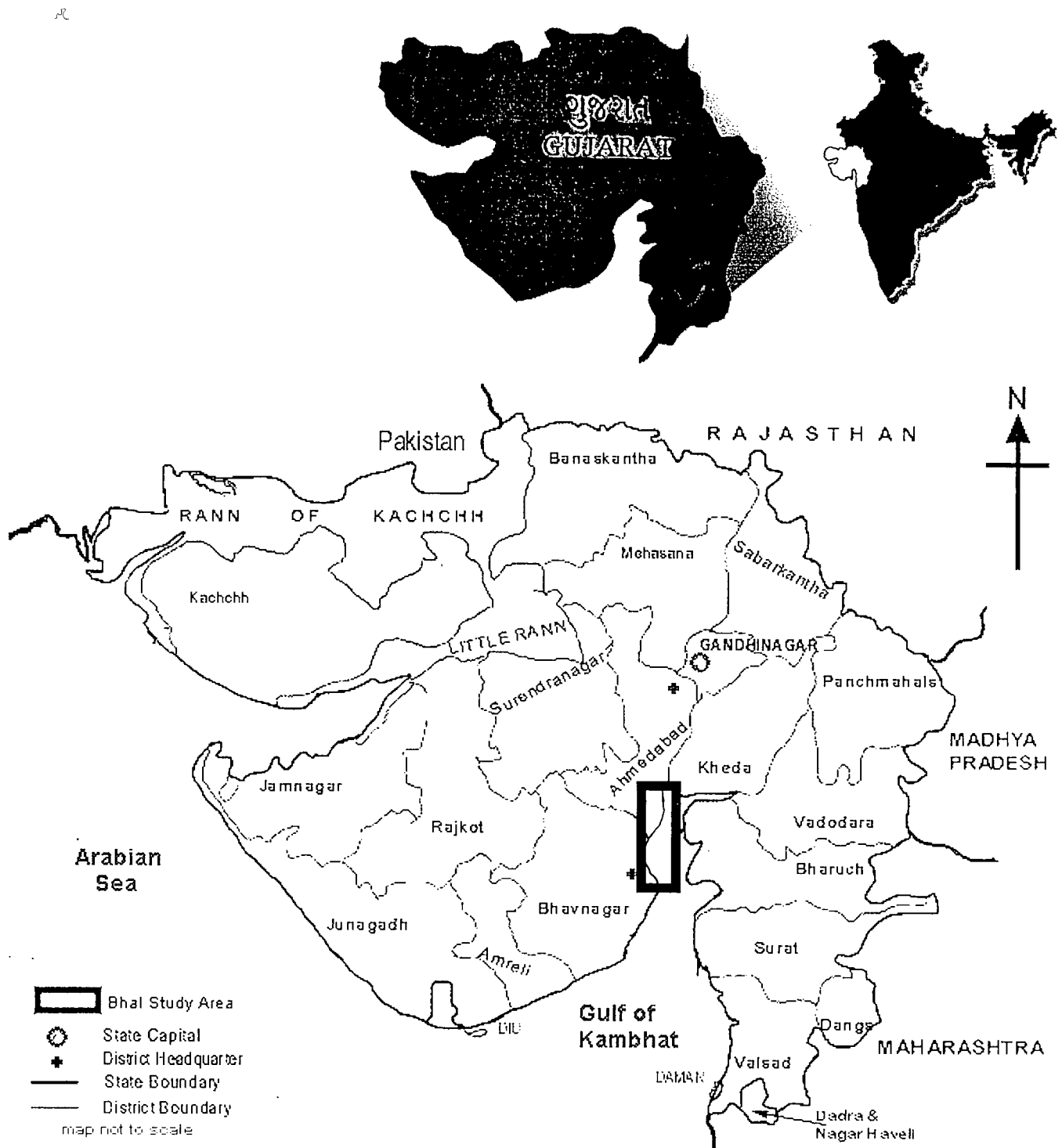
Often, gender analysis within WRM is limited to women's culturally defined roles related to fetching water and neglects the gender biases that often exclude women from the village-level institutions which manage these resources. Cultural and gender biases create barriers against effective gender-equitable participation and representation within institutions for the management of local water resources. Moreover, gender biases allow women's potential contributions to be overlooked and excluded from village-level decision-making and

management activities. An integrated gender component, however, requires that gender implications must be understood and appropriately integrated into planning, implementation and ongoing maintenance of the water resources, particularly the decision-making process. Although my case study takes place in rural Gujarat, India (see Figure 1.1), the argument has relevance in many countries of the South struggling with scarce potable water and gender biases.

Much of India, including the state of Gujarat, is following the contemporary trend towards decentralising water resources by shifting away from the top-down approach to development and management and handing over control of water resources to rural villages. Although Gujarat's emerging participatory WRM framework proposes the establishment of new village-level institutions, the issue of how to integrate gender poses new challenges. Centuries of social inequalities based on gender, class and caste have the potential to become further entrenched by decentralisation if appropriate water resource management activities and institutions are not established. With strong gender-defined roles and responsibilities, a gender analysis within WRM initiatives and management schemes is necessary. At the village level, gender relations and access to decision-making are important factors in planning for water resources management, social security and economic prosperity. A well integrated gender approach also acts as an entry point for women to the political, social and economic decision-making process.

FIGURE 1.1

GUJARAT, INDIA

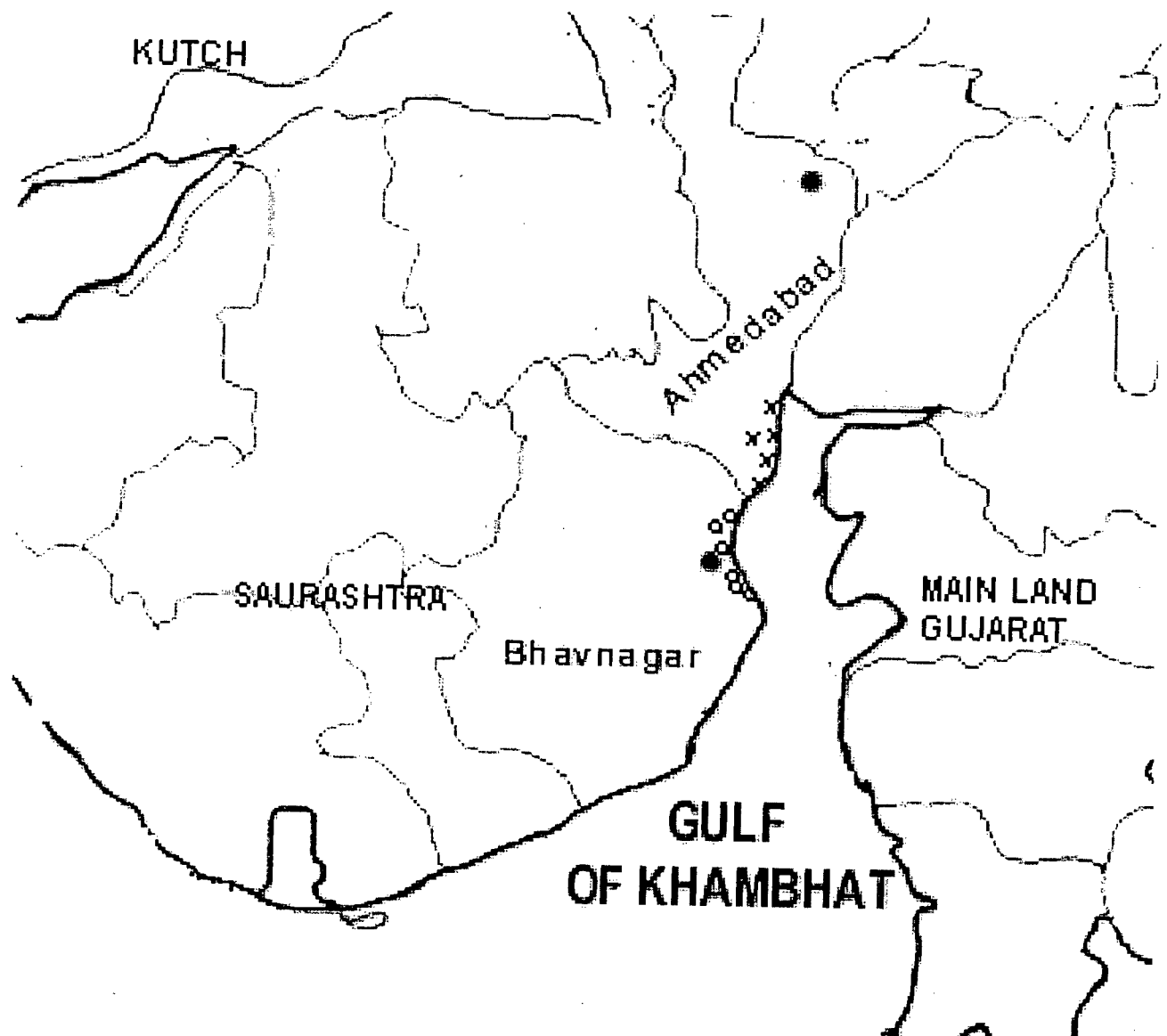


In this thesis, I will examine the gender implications of women's participation in potable WRM initiatives in rural Gujarat, India. The case study concerns a development initiative undertaken by two Gujarati grassroots Non-Governmental Organisations (NGOs), *Utthan* and *Mahiti*. Their goal is to create, within a gender equity framework, sustainable drinking water sources in villages which are struggling to cope with drought and salinity. Increasing ecological and demographic pressures on the rapidly deteriorating drinking water resources have placed these villages, at risk. *Utthan* and *Mahiti* believe that the local people, with their intimate knowledge of resources and their role as the most affected user groups, have the most to contribute to and the most to lose from the process of development.

The study area is located in a 'saline desert' known locally as the Bhal, which means forehead or the place where nothing grows. This geo-climatic region is an arid low-lying coastal tract next to the shores of the Gulf of Khambat. The Bhal (see Figure 1.2 and 1.3) experiences seasonal drought and high salinity of soil and water resources which is caused by a short seasonal rainfall with high rates of evaporation. Along with the naturally harsh environment, maldevelopment¹ has caused over-exploitation of natural resources leading to rapidly deteriorating natural potable water resources. The dropping of the fresh water table has allowed for the intrusion of the sea, causing the natural potable water resources to increase in salinity. In addition to an increasing rate of seasonal groundwater salinity and drought, which exacerbate concerns about sufficient potable water, the rural people of the Bhal also struggle to cope with poverty and social conflicts.

¹ Vandana Shiva (1988:5-6) defines **maldevelopment** as: "the violation of the integrity of organic, interconnected and interdependent systems, that sets in motion a process of exploitation, inequality, injustice and violence." See also Samir Amin (1990).

FIGURE 1.2 BHAL STUDY VILLAGES



Study Villages

- x Coastal Ahmedabad Villages
- o Coastal Bhavnagar Villages

FIGURE 1.3 **THE BHAL**



The Bhal landscape in early winter, small brush still green. The white mound in background is a large pile of salt for commercial sale.



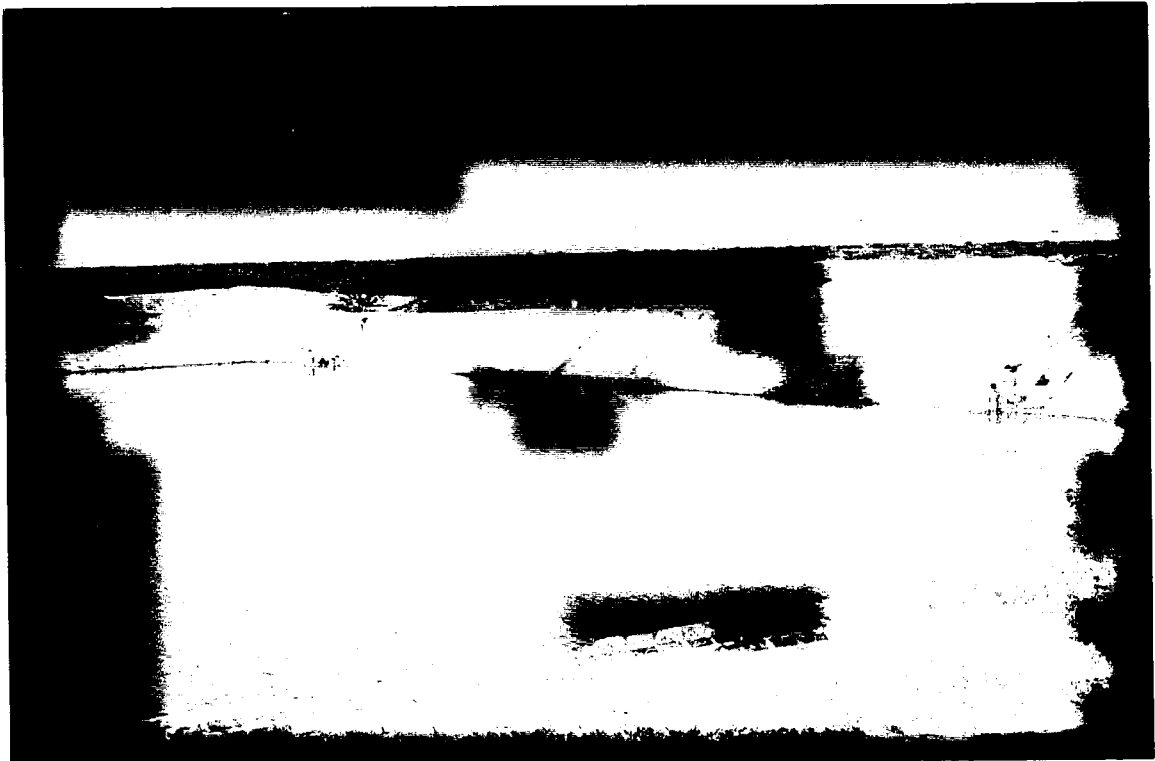
Children going to fetch water in a village in the Bhal, Gujarat.

The development initiatives in the study villages involve the creation of new village-level potable water resources based on traditional techniques of rainwater harvesting, each with a technological modern twist. For purposes of comparison, the study areas are defined by the different rainwater harvesting WRM initiatives taking place therein. Within the study villages of Coastal Ahmedabad and Coastal Bhavnagar Districts of Gujarat, I will examine the WRM initiative of common property Plastic Lined Ponds (PLPs) and private property Roof Water Collection Tanks (RWCTs), respectively (See Figure 1.4). Although the development initiatives are different, both the NGOs have encouraged an integrated gender WRM approach via village-level institutional management of local water resources.

With regard to the WRM initiatives in the Bhal, I will explore the need for and means of achieving an appropriate, integrated gender component within WRM initiatives. Although the mainstream development discourse promotes an integrated gender framework, my experience at the village level suggests that this, in itself, is not sufficient to meet its intended objectives. The mainstream Gender, Environment and Development (GED) framework suggests that the means to increase local participation, particularly of village women who previously had no official roles or responsibilities, can be achieved by integrating women into village-level institutions which govern the water resources. However, my experience in the Bhal revealed that an integrated gender component within WRM initiatives, although beneficial, did not always achieve its dual goal of increased access to and control of water resources and gender equitable participation. Simply integrating women into village-level WRM institutions was insufficient for increasing water security and redistributing power along gender lines. Yet, in a few of the study villages, women did succeed in taking a

FIGURE 1.4

RAINWATER HARVESTING SYSTEMS



A Plastic Lined Pond (PLP), in a study village of Coastal Ahmdabad, Gujarat.



A Roof Water Collection Tank (RWCT) system of a house in a study village in Coastal Bhavnagar, Gujarat. Note the metal shaft running along the roof edge (left) small bucket and plastic piping (centre) leading to underground tank for storage. (Courtesy of John Wood.)

leadership role in WRM. Thus, in order to learn the strengths and weaknesses of an integrated gender component in WRM at the village-level, it is important to ask: *why were women in some key villages able to overcome the gender barriers and take on a leadership role in WRM initiatives, while others in other villages were not? Moreover, what must an integrated gender component within WRM initiatives include, so that women can not only be participants but succeed in taking a leadership role?*

Recognising that there are numerous social variables which either hinder or contribute to rural village-level WRM initiatives, this thesis focuses on the implications, applications and potential contributions of an integrated gender component. Although gender is only one of many key variables which affect access to and control of natural resources, it is important to focus on gender relations because they influence how natural resources are used and managed. Moreover, degradation of the natural resources impacts gender, other social relations and village welfare. In any gender analysis, it must also be remembered that “[i]n terms of access to and control of resources, gender interacts with other aspects of socio-economic differences...[and] that women cannot be considered a homogeneous category in terms of their interests and needs” (Meinzen-Dick and Zwarteveen, 1999:32).

Although the case studies feature rural villages in Gujarat, India, they are reflective of the development crisis in many parts of the South where environmental degradation and the gap between the ‘haves and have-nots’ is increasing as access to potable water is decreasing. Whether the objective of the WRM initiative is to achieve more efficient and sustainable management of water resources, or to promote equity and greater local participation and

control, systemic power differences between men and women must be considered (Meinzen-Dick and Zwarteveen, 1999:33). Gender analysis is important not only for increasing the efficiency and sustainability of water resources, but as the case study reveals, may also provide both the context and the content of women's struggles by addressing the gender-barriers to water access, control and maintenance at the village level.

1.1 Problem Statement

The village women who participated in this study ranked the drinking water shortage as the top concern of their villages in the Bhal. "No other community development can be done until we solve the drinking water problem." This reflected the fact that increasing pressure on the fragile ecosystem, brought on by the current socio-political consequences of unsustainable development, was causing further degradation of the drinking water resources and increasing impoverishment of the people of the Bhal. The social and economic consequences of the intensified potable water shortage are reflected in increased caste and class social conflict and seasonal out-migration of about 80 per cent of the population due to the lack of a source for income generation (Barot, 1992). To combat the potable water shortages and social problems in the Bhal, the NGOs presented in this study have co-operatively worked with women and men of the study villages via an integrated gender approach to WRM.

In all the study villages there was a similar integrated gender component within the WRM initiatives. However, in 9 of the 11 study villages, the framework did *not* adequately increase access to and control of local water resources at the village level, *nor* did it achieve gender equitable participation in management activities and decision making in village-level

institutions. Simply, the strategy did *not always* create a redistribution of power between women and men. In some cases this can be partially attributed to other uncontrolled variables (e.g. social conflicts) in the individual villages. All 9 villages had similar cultural and gender biases which created substantial barriers to women's effective participation. It is thus notable that the 2 study villages in which access to and control of local water resources increased, giving rise to greater drinking water security, were successful primarily because of village women's collective action in the management of common resources. Due to the women's collective action, not only was the drinking water problem virtually solved, but their actions created gender-equitable redistribution of responsibilities and control. This allowed a new focus for further community development.

This study reveals a unique set of observations adding important insight and analysis to the gender and WRM framework. Although in both study areas the NGOs pursued a similar integrated gender equity WRM framework, different levels of success were experienced between and within the study areas. It may be inferred that gender integration requires more than women's participation in digging or laying bricks, or even increasing visible membership of village women in formal decision-making institutions. Although there was a substantial increase in women's understanding of the WRM issues, which is a valuable part of the empowerment process, simply integrating a gender component in WRM did not always change gender biases or allow women to become active in the decision-making process. A few key villages, however, reveal that women's increased control over common property water resources could substantially benefit village welfare.

It will be argued here that, even within WRM initiatives which have an integrated gender component, women's and men's strategic interests² will not be articulated or reflected unless there is a redistribution of power along gender lines. The study villages illustrate the fact that simply integrating women into decision-making institutions is inadequate for achieving gender equitable participation in WRM initiatives. Additional key factors must also be present in order to make women's presence on local decision-making bodies (such as water committees or *Pani Samitis*) effective for meeting the dual objectives of the gender and WRM framework: increased access to and control of water resources and gender equitable participation. These factors are: 1) village-level women's groups (such as women's savings groups or *Mahila Mandals*) must also be present and have a mandate to disseminate information to village women not involved on the water committee; and 2) the women's groups must take a leadership role by co-operatively managing one or more common water resource, whether it be a natural source or the new source created by the WRM initiative. The study shows that where these two factors were present (and other social variables did not create a rift between the villagers), women were able to break down the gender biases, allowing for a redistribution of power. Moreover, women were able to develop effective means of participation in order to curb not only the rapid degradation of potable water resources, but also to collectively act as agents of social change.

² 'Strategic interests' to be discussed in Chapter 2.

1.2 Thesis Objectives

The objectives of this thesis are to:

- 1) **examine drinking water access and source management in the study villages of the Bhal,**
- 2) **analyse the effectiveness of a gender-integrated approach to WRM initiatives in meeting the dual goals of a) increased access to and control over potable water resources, and b) gender equitable participation; and**
- 3) **evaluate the appropriateness of the literature on Gender and Natural Resources Management as it reflects the reality at the village level.**

The above objectives will be addressed by examining two WRM initiatives which aim to increase quantity and quality of drinking water using two different rainwater harvesting techniques. The specific WRM initiatives differentiate the two study areas. Study villages within Coastal Ahmedabad illustrate the common property resource approach via Plastic Lined Ponds (PLPs) and those of the adjacent study area of Coastal Bhavnagar illustrate the private property resource approach of Roof Water Collection Tanks (RWCTs).

I choose to focus on *gender*, because gender influences the roles, relationships, and responsibilities of human beings through all dimensions of community activity. Moreover, until recently, gender implications have been left out of community-level development decision-making. Understanding gender power structures in relation to the control and access to natural resources explains a great deal regarding the context and content of women's

struggles in non-western societies. At the same time, such an examination also reveals the inherent problems of maldevelopment.

2.0 Conceptual and Analytical Framework: Gender Participation and Women's Empowerment in Natural Resources Management

Current development theorists argue that in order to strive for sustainable development, we must recognise and overcome the consequences of decades of maldevelopment. That is, sustainability can *not* be achieved if we continue with the present rate of ecological degradation, accompanied by the increasing gap between rich and poor and the decreasing quality of life for the majority of rural villagers in developing countries, especially women. The feminist and ecological movements are demanding a shift in the development agenda which encourages decentralised management of natural resources within a gender and culturally sensitive framework. Here it is emphasised that, as solutions to the development crisis become a matter of environmental and human survival, an alternative development strategy must be followed by mainstream development agencies. Presented below is a brief overview of different theoretical development perspectives integrating ideas about women, gender, and the environment and demonstrating their application to Water Resources Management (WRM).

2.1 Women, Gender and Development

In order to appreciate where the current theories evolved from and get a glimpse of why the mainstream has shifted to the current focus on gender, it is important to understand the shifts in paradigm from Women In Development (WID), Women And Development (WAD), to Gender And Development (GAD) and beyond. It is also important to understand the need for and the value of a created space for a diversity of women to hear their voices

reflected in the international forums which discuss solutions to the global environmental crisis.

2.1.1 *Women In Development (WID) and Women And Development (WAD)*

Ester Boserup's 1970 seminal work *Women's Role in Economic Development* added 'women' into the development literature. Previously, development was 'gender blind' in that gender differences were starkly omitted by only focusing on economic growth. Boserup's book set out to show that 'Third World' women's economic and social development contributions, both formal and non-formal, could no longer be overlooked as they were key players whose contributions affected a country's well-being. She also stressed that modernisation was actually displacing women from their traditional productive functions and diminishing their incomes. Moreover, she reflected on "particular problems of women" and their need to be addressed by development theorists and practitioners. Her objective was "to identify these [political-economic] patterns and to explain their significance from the point of view of development policies" (Boserup, 1970:5). Thanks to Boserup's book and the mainstream response to it, the UN followed suit and declared 1975-1985 "The Decade for the Advancement of Women." A radical paradigm shift began, from women or gender not being a factor, to a "Women in Development" (WID) perspective where women started to be included in projects. WID called for equity between the sexes and a focus on poor women as the beneficiaries of a basic needs approach to development. The women-focused decade of development provided funds and resources and encouraged aid agencies and governments to question the previous assumption of gender neutrality in the costs and benefits of so-called development.

Within the WID decade the paradigm shifted to Woman and Development (WAD), implying that women ought to be 'integrated' rather than simply 'added on' to existing development initiatives.¹ This shift occurred for two main reasons; the first being a critique of the WID assumptions and approach and the second, the decline of the global economy in the 1980s. WID was criticised in the 1970s for the fact that women were not being consulted and were just being lumped into development projects without any effective or relevant role or benefit. Women became the prime focus of concerns about 'over-population' and the 'food crisis'. They were seen as passive recipients of development via the basic-needs and welfare approaches. WAD was a Marxist vision of development as it moved towards incorporating women as participants and beneficiaries in all sectors of the subsistence and market economy (Sen and Grown, 1987). Women were seen as vital participants in projects and were incorporated within them in appropriate ways. However, in the 1980s, the focus again turned to economic growth, efficiency, increased export and integration into the global economy. With this came the Northern imposed Structural Adjustment Programs (SAPs), which directed money away from local economic and social development into activities which would assist in debt reduction (Sen and Grown, 1987).

Both WID and WAD have been highly criticised by development academics, theorists, practitioners and grassroots organisations in the South. They claimed that, the implicit assumption behind many of these programmes was that women's main problem in the Third World was insufficient participation in an otherwise benevolent process of growth and development (Sen and Grown, 1987, Shiva, 1988). Indeed, the modernisation and

¹ For an excellent discussion on WID, WAD and GAD see Nalini Visvanathan 1997.

'trickle down' theories implied that if women increased their shares in resources, land, employment and income, relative to men, the resulting effect would be better living standards. However, southern studies showed that instead of improving, the socio-economic status of a great majority of Third World women and their families actually worsened considerably during the UN Decade of the Advancement of Women (Sen and Grown, 1987, Shiva, 1988). This was due to the fact that women's access to economic resources, incomes, nutrition and education all declined while their work load increased (Shiva, 1988:3). Moreover, WID and WAD did not address the root problems of colonial patriarchy, traditional oppression within a cultural context and the global, post-colonial context of Western-led development. There were still omissions regarding the central question of power relationships, control over micro-economies, natural resources management and decision-making access.

2.1.2 Gender And Development (GAD)

The late 1980s brought a paradigm shift emphasising women's and men's power struggles and conflicts in different societies throughout the South. Moving beyond its predecessors, the Gender and Development (GAD) school critiqued the previous decades of WID and WAD theories, as they failed to question power relationships inherent in traditional gender roles. GAD acknowledges *women as agents of change* and insists on the implicit need to challenge the confines of patriarchy, to find a path towards sustainability. GAD objectives are to empower women and improve their place and participation in society, understanding that the structure and dynamic of gender relations is central to the analysis of social organisation and social progress (Moser, 1993). GAD started to raise fundamental questions about the process of development and the gender implications of raising women's self-

awareness and empowerment. The analysis attempts to consider power inequities at micro and macro levels of social, economic and political relationships which affect women's ability to lead and benefit from the development process (Visvanathan 1997). Moreover, GAD does not focus on only women, but on the relationship between women and men. It "examines unequal relations of power across all categories and seeks equitable, sustainable development with women as well as men making decisions" (Slocum et. al., 1995:15).

The key to GAD analysis, as opposed to the WID or WAD approaches, is that it moves beyond the practical needs approach² to examine the strategic interests³ of women and men. It attempts to dismantle patriarchy by emphasising the need to: a) open and restructure access to subsistence and economically productive resources and their benefits; b) make women visible in and a part of social development processes; and c) increase women's access to and participation in decision-making processes at the micro and macro levels. GAD's methodology thereby encourages the creation of a secure space for women's participation in the three key groups of power resources -- economic, social and political -- essential to women's empowerment in any process of development with the goal of sustainability. However, one of the major oversights within GAD is that although its' aim is sustainability, it lacks the much needed environmental framework depicting the limiting factors resulting from the rapid degradation of nature's goods and services.

² **Practical needs** are those that are linked directly to women such as the basic needs of food, water and shelter. This approach sees women as beneficiaries and / or participants without challenging the power relations between women and men.

³ **Strategic interests** relate to improving women's position by pursuing gender equity power relations and sees women as not only participants but as active agents of change so women and men can have equitable control over their own economic, political and social realities.

Indeed the attention women and, more recently, gender relations have received over the past two decades within the alternative community development discourses, has advanced mainstream development agendas towards greater gender equity. Mainstream gender analysis, however, still blames patriarchy, and thus often falls short of its transformative potential. Jackson (1998) points out that

[t]he concepts of gender analysis are not usefully applied with a structuralist emphasis, which too readily assumes the absence of choice and the presence of overwhelming constraint, and implies therefore that women are helpless in the face of patriarchy. Gender analysis, deserves a more considered application in recognition that women are fully acting human subjects, whose lives offer choice as well as compulsion (Jackson, 1998:26).

Moreover, a gender analysis, which is limited to male domination over women cannot explain other structural constraints on women, their choices and reasoning.

2.2 Women, Nature and Development

2.2.1 *Ecofeminism*

The term “ecofeminism” emerged in the 1970s. It was coined by the French writer Francoise d'Eaubonne in 1974, when she called upon women to lead an ecological revolution to save the planet (Braidotti et al., 1994:161). She paralleled the ideas and values proposed by feminism to those of the environmental movement of the time. Ecofeminism encouraged women's environmental thought and activism, recognising the connection between the destruction of nature, the constructs of hierarchy and the patriarchal growth model of development. Hessing argued that “the linkages between environmental degradation, poverty and powerlessness affect all women, although variations of culture, technology and class produce different impacts among and within countries” (Hessing, 1993:14)

In 1988, the physicist, environmentalist and social activist, Vandana Shiva, stated in her book *Staying Alive* that “at the end of the Decade [for Women and Development], it was becoming clear that development itself was the problem” (Shiva, 1988:2). Shiva was one of the first among southern women to adopt the term ecofeminism in its application to development. Ecofeminism stressed that male-dominated societies and their cultures, political-economic systems, science, technology and colonialism are all based on patriarchy which inherently perpetuates oppression of women and nature (Shiva, 1988). The economic growth model of development is one that is based on the accumulation of capital, surplus and wealth, but is also associated with the creation of poverty and dispossession. Popularising the movement which blamed patriarchy for the crisis of environmental decay, women’s oppression and maldevelopment practices around the world, Shiva (1988) insisted that

insufficient and inadequate ‘participation’ in ‘development’ was not the cause for women’s increasing under-development. Rather, it was an enforced but asymmetric participation in development, by which women bore the costs but were excluded from the benefits, that was responsible (Shiva, 1988:2).

Staying Alive argues that “there is only one path to survival and liberation for nature, women and men, and that path is the ecological one, of harmony, sustainability, and diversity, as opposed to domination, exploitation and surplus” (Shiva, 1988:back cover). Ecofeminism as a social movement became important as it challenged the whole notion of ‘development’ that had been dominant since the end of the Second World War, pushing the process of not only modernisation, which emphasised the top-down growth model, but also westernisation which spread Western culture. This form of development, Shiva argues, is based on the exploitation of natural resources for commodity production and growth. It does not consider the value of natural resources as holistically and interdependently essential for

an ecosystem and basic needs subsistence such as air, water, flora and fauna. She says, throughout the South, “women, peasants and tribals are struggling for liberation from ‘development’ just as they earlier struggled for liberation from colonialism” (Shiva, 1998:2).

Ecofeminism moved away from early development theories which portrayed women as ‘victims’ or as ‘beneficiaries’ and defined the patriarchal confines of development itself as the main barrier for women as caretakers of the environment. Women are identified as having a key role to play in natural resource management, utilising their knowledge and experience gained from being the closest user groups (Arya, 1998:168). Bina Agarwal (1992) summarises the ecofeminist arguments as follows:

(1) There are important connections between the domination and oppression of women and the domination and exploitation of nature. (2) In patriarchal thought, women are identified as being closer to nature and men as being closer to culture. Nature is seen as inferior to culture; hence, women are seen as inferior to men. (3) Because the domination of women and the domination of nature have occurred together, women have a particular stake in ending the domination of nature, in healing the alienated human and non-human nature. (4) The feminist movement and the environmental movement both stand for an egalitarian, non-hierarchical system. They thus have a good deal in common and need to work together to evolve a common perspective, theory and practice (Agarwal, 1992:120).

Shiva has been both revered and criticised for her seminal work. Critics such as Bina Agarwal argue that “her examples relate to rural women primarily from north-west India, but her generalisations conflate all Third World women into one category...she does not differentiate between women of different classes, castes, races, ecological zones, and so on” (Agarwal, 1992:124-125). Secondly, Shiva paints a romantic and monolithic picture of Hindu spiritual links between Goddess, woman and nature. She presents this connection

through a concept of biological and spiritual 'Motherhood'. The constructed image of the two 'motherly figures' objectifies both women and nature. Third, Shiva

attributes existing forms of destruction of nature and the oppression of women (in both symbolic and real terms) principally to the Third World's history of colonialism and the imposition of Western science and a Western model of development...However, it cannot be ignored that this process impinged on a pre-existing base of economic and social (including gender) inequalities (Agarwal, 1992:125).

In my view Shiva's argument stating that women inherently understand and have an affinity for nature through common biological rhythms weakens her overall argument. Proposing an inherent connection exaggerates and 'romanticises' women. The danger in this is that it objectifies them and thus exposes them to further patriarchal exploitation. Shiva's argument also devalues women's learned knowledge of the ecosystem and their managerial skills acquired and passed down from women of past centuries.

2.2.2 Women, Environment and Development (WED)

The model of development called Women, Environment, Development (WED) came out of the rejection of two key elements of ecofeminism: (1) the Hindu spiritual embodiment of a Goddess directly relating women to nature and (2) the 'feminine principle' assuming women's special empathetic and nurturing capacities in relation to nature. By the late 1980's the WED perspective and the joint approach of feminists and environmental developmentalists who aimed at liberating women and nature together, became an established item on the mainstream international development and environmental agendas. WED, in rejection of the spiritual and romantic, "highlights women as having a 'special' relationship with the environment, as its users or 'managers'" (Leach, 1995:1). Like ecofeminism, WED recognises how the conventional development agenda causes

displacement of women's productivity by removing land, water and forests from their management and control. Both ecofeminism and WED see "women's 'subsistence perspective' inevitably instilling in them a respect for nature, both the diversity and the limits of which cannot be violated" (Mies and Shiva, 1993:19).

Again, WED proponents also fall short of expressing the true diversity as they present all 'third world women' as the same, ignoring the differences between women according to caste, class, ethnicity, age and marital status. Also, WED "invisibilises men" (Leach, 1995). It makes assumptions that women's and environmental interests as being complementary. Moreover, the dualism of women/men and nature/culture is further perpetuated which can only lead to further destruction and deeper dualism. WED proposed that by stopping the abuse of power and oppression inherent in patriarchy, which was leading the planet to environmental catastrophe, the planet could see radical change for the benefit of all.⁴

2.3 Gender, Natural Resource Management and Development

2.3.1 Gender, Environment and Development (GED)

Gender, Environment and Development (GED) is a currently emerging alternative community development approach which proposes the application of gender analysis to any natural resource management initiative. GED is a feminist approach to natural resource management which evolved out of the ecofeminist movement. Bina Agarwal (1988), in her critique of ecofeminism argues that it has

⁴ This common aim was agreed upon and vocalised in a women and environment focused chapter of the United Nations *Agenda 21*, a document focusing on the environment, stating the intended and agreed direction the nations will take as they enter the 21 Century.

[t]ended to obscure, rather than grapple with, the political economy factors underlying women's subordination, nature's degradation, and their interlinks. It has also mostly ignored gender inequalities that are independent of the environmental question. And it has paid little attention to institutional change and the processes for transforming gender relations (Agarwal, 1998:57).

GED has been styled as Gender Analysis (Jackson, 1993), Feminist Political Ecology (Rochleau, 1995), Feminist Environmentalism (Agarwal, 1992), and Micro-Political Economy of Gendered Resources Use (Leach, 1991) (Jackson, 1998:27). Although these theories are somewhat different in focus, their central theme is common and in this thesis will collectively be referred to as GED (Jackson, 1998). The GED theoretical perspective attempts to pursue sound environmental management with a gender perspective on the congruent goals of gender equity, women's empowerment and environmental sustainability. GED focuses on gender relations and cultural power structures as political-economic institutions which mediate people's relationships within particular environments (UNIFEM web site, 1999). GED theory recognises the "political nature of development as well as the fact that concepts and causes of 'development' and 'underdevelopment' reflect imbalances of power within and between nations, rather than the presence or absence of resources" (Braidotti, et. al., 1994:117).

This is also reflected in a similar framework, coined by Bina Agarwal (1992) as Feminist Environmentalism, which is on much the same lines as the GED theory and its diagnoses of development problems. Agarwal states:

In terms of action such a perspective would call for struggles over both resources and meanings. It would imply grappling with the dominant groups who have the property, power, and privilege to control resources, and these or other groups who control ways of thinking about them, via educational, media, religious, and legal institutions. On the feminist front

there would be a need to challenge and transform both notions about gender and the actual division of work and resources between the genders. On the environmental front there would be a need to challenge and transform not only notions about the relationship between people and nature but also the actual methods of appropriation of nature's resources by a few (Agarwal, 1992:127).

At the village level, GED stresses the need for a gender equitable power distribution as a means to solve the multi-layered social power imbalance affecting people's experiences, concerns and capabilities in natural resource management. It insists that "to transform gender relations, and relations between people and nature, will need enhancing of the bargaining power of women vis-à-vis men and those seeking to conserve the environment vis-à-vis those who cause its degradation" (Agarwal, 1998:55). It aims to work in a "bottom-up" fashion by integrating gender issues into analysis of environment and sustainable development policies in ways which will lead to progressive change for women (Leach, et. al., 1995:1).

GED recognises women's work, knowledge and inequitable access to resources and power. GED's shift to gender, rather than to women only, implies that women alone should not be expected to protect and restore the rural ecosystems. Men too are seen as having a part in the solution to development and environment crises while their initiatives to conserve resources should also be harnessed.

The way women are affected by the degradation of the environment, and the strategies they employ to counter these crises, are indeed [culturally] gender specific, but their position as women alone do not qualify them to manage the environment better than any one else (Baridotti, et. al., 1994:8).

GED argues that women and men have different interests and needs in relation to water and vegetative (agricultural and/or natural) resources, and that important hydrological,

geological, and seasonal knowledge can be revealed through a gender perspective, contributing to the management of the resources (Leach, et. al., 1995:5). Women and men's perspectives differ, not only because of the gender division of labour, but more importantly because of differential access to the resource (whether biophysical or social) and differential input in the formal and informal decision-making affecting management of the resource itself.

GED illustrates a two-way relationship between gender relations and rural environmental change. A diverse set of papers in a 1995 *IDS Bulletin*⁵ presents theory and case studies, which show how

[g]ender relations have a powerful influence on how environments are used and managed, and hence on patterns of ecological change over time. Yet environmental trends and shocks also impact on gender relations, whether directly -- for example as ecological degradation alters the gender distribution of resources, -- or indirectly, in the political or ideological use of environmental issues to uphold or challenge particular relations or forms of subordination (Leach et. al., 1995:5).

GED draws on a number of elements which enable the construction of a gender sensitive development framework for analysing dimensions and implications of environmental change and redistribution of power. In application of a gender analysis to an environment and development framework, the factors causing the rapid degradation of nature's goods and services are reflected to the social impacts and vice-versa. GED stresses the need to go beyond blaming patriarchy as the cause of degradation of both nature and women, as it seeks to empower women and encourages effective participation via capacity building. GED links the empowerment of women to the enhanced prospects of developing sustainable

⁵ For an excellent discussion on GED with a variety of case studies please refer to *IDS Bulletin* 26:1, 1995.

communities through the mobilisation and redistribution of power at the village level. However, I believe it fails to address at any concrete level the inequities between classes, castes and ethnic groups at the village level.

2.4 Gender and Water Resources Management

2.4.1 *Water Resources Management (WRM)*

Water Resources Management (WRM) is a framework that links human socio-economic activity, the biophysical health of a watershed ecosystem and the institutional management of watershed or land and water resources. WRM can be defined as the process of guiding and organising land and other resource use on a watershed to provide desired goods and services without adversely affecting soil and water resources (World Bank, 1993). Embedded in the concept of watershed management is the recognition of the interrelationships among land use, soil, and water, and the linkages between upland and downstream areas. Community Water Resources Management (CWRM) is a new approach to Water Resource Management (WRM) which aims to provide not only sufficient quality and quantity of water for different land and water needs, but also a more socially equitable process of community participation. CWRM usually works with the natural fixed boundaries of the micro-watershed while emphasising participatory management of local water resources (Green 1995 and Shah 1998).

The CWRM approach builds on the three components of WRM, that is the biophysical, socio-economic and institutional by emphasising local community management. The CWRM framework aims to maintain the water resources above and below ground both up and downstream, believing that it can have a positive impact on the socio-economic

aspects of the area within the watershed, as well as the biophysical aspects of the ecosystems (Hannan-Anderson 1995). This contemporary concept of CWRM acknowledges not only the socio-economic and political demands placed on the watershed, but also the ecological limitations (SIDA web site, 1999). Its goal is *sustainability*, through the creation of effective multi-use and multi-stakeholder participation, by using as its framework the integration of the biophysical, socio-economic and institutional spheres of planning. CWRM emphasises both quality and quantity of water through adequate supply and equitable access to water with a balanced human-ecosystem interaction (SIDA web site, 1999).

There are numerous approaches to WRM including River Basin Management or Watershed Management, Wetland Development, Irrigation, Drinking and Domestic Water Resource Management and Drought and Desertification Management (Hannan-Anderson 1995). While still emphasising the virtues of community participation, the international development discourse has turned to a more economic efficiency agenda as presented in and adopted by the WRM framework. This is presented in: *Agenda 21: Protection of the Quality and Supply of Freshwater Resources: Application of Integration Approaches to the Development, Management and Use of Water Resources*;⁶ *International Conference on Water and the Environment (ICWE): The Dublin Statement on Water and the Environment*;⁷ and *Water Resources Management: A World Bank Policy Paper*.⁸

These current policies at the global and national levels in developing countries are problematic both ecologically and socially. First, their focus is on demand expressed as

⁶ For the full document see UNCED, 1992.

willingness to pay, which adversely affects the poor, especially women. Second, their economic efficiency agenda conflicts with, and often overrides, the much-needed environmental and social framework which reflects the ecological constraints of supply and social barriers to access. Third, drinking water (including domestic water) is neglected, as opposed to irrigation water which is seen as a key aspect of the economic or environmental sustainability of an area. Fourth, the Water Users Associations (WUAs) or water management groups are village-level bodies able to direct water resources development and management. These groups mainly consist of landowners and the politically powerful, while often excluding poor households, tenants and women in general. Finally, when applying a gender analysis it is revealed that women are most adversely affected by the cumulative effects of the above due to the gender division of labour and differential access to the decision-making process (Green et al. 1994 and vanWijk-Sijbesma 1998).

2.4.2 Gender and Water Resource Management

Although the CWRM school encourages the establishment of local socio-political institutions for the management of the natural resources, these new decision-making processes may create new barriers for women. Many CWRM strategies simply add on or inappropriately integrate a gender component which tends to focus on gender equitable representation (on water committees, for example) rather than address women's strategic interests (Green, 1995). It is here where a gender analysis reveals the urgency of a culturally gender sensitive approach. If it is not applied, there may be an increased tendency to exclude

⁷ For the full document see ICWE, 1992.

⁸ For the full document see World Bank, 1993.

women from participation in, and ignore their contributions to, the decision-making process and management of natural resources such as water.

The aforementioned international WRM policies project a massive shift towards decentralisation and community participation in WRM. However, “[w]hether the policy objective is to achieve more efficient and sustainable use of resources, or to promote equity and greater local participation and control, systematic power differences between men and women merit attention” (Meinzen-Dick and Zwarteveen, 1998:338). Although the mainstream CWRM literature’s aim is sustainability, it has taken on an economic agenda and thus lacks the much-needed environmental framework. It fails to depict the limits of the rapid degradation of nature’s goods and services, together with the social relations of gender, class- and caste-differentiated access to, as well as the use and management of, water resources. Moreover, both the policies and the CWRM framework itself lack a gender analysis and therefore do not address gender implications (Green et. al., 1994). This is important from a water resources perspective, in that it causes major oversights which impede the goal of sustainability. Narayan (1995) in her review of people’s participation in 121 rural water supply projects cited that only 17% achieved substantial levels of female involvement (Narayan, 1995). It is clear that more research is needed for integrating a gender analysis into drinking and domestic WRM strategies.

The Dublin Statement on Water and the Environment (1992) has taken positive steps towards sustainability in adopting a gender analysis which states:

Principle No.3 --- Women play a central part in the provision, management, and safeguarding of water. Acceptance and implementation of this principle

requires positive policies to address women's specific needs and to equip and empower women to participate at all levels in water resources programs, including decision-making and implementation, in ways defined by them (ICWE, 1992:4).

Due to such an emerging international consensus on water resources in developing countries there is an increasing urgency to mainstream gender analysis within the WRM framework. More research, however, is needed in this area. "Increasing the recognition and legitimacy of women's water related needs and interests and of gender as a source of differences as regards those needs and interests crucially depends on more information and on research to gather this information." (Meinzen-Dick and Zwarteveen, 1998:340).

The links between gender and communities have direct consequences for the efficiency and sustainability of natural resources as well as for the livelihoods of people who depend on those resources. The linkages become especially relevant for policies in the context of the current emphasis on devolution of resources management. As the state transfers responsibility and rights over natural resources...to local "communities," membership in local resources management organisations takes on an increasingly important role in determining rights over resources. Hence, it is critical to examine and be aware of *who* within the communities takes on the task, who controls use, decision-making, and the stream of benefits (Meinzen-Dick and Zwarteveen, 1998:338).

Although gender relations and WRM are becoming more acknowledged within community development initiatives, gender is often limited to an inserted component, rather than a fully integrated gender analysis. This is due to the tendency of developmental practitioners to isolate women through the gender division of labour. For example, within the mainstream there has long been recognition of the relationship of women to domestic water supplies and sanitation. Here, however, women are seen as "beneficiaries" because of the gender division of labour. No attention is paid to the underlying impacts and implications of gender power relations, gender-determined access to resources and barriers to participation in

decision-making bodies. An integrated gender analysis has yet to be recognised in relation to overall water resources management (SIDA web site, 1999).

Progressive development agencies such as the Swedish International Development Agency (SIDA), are recognising that,

[a] new vision for water resources management has to take place from a gender perspective - i.e. to give adequate consideration to the roles, needs, access to and control over resources and decision-making of both women and men (SIDA web site, 1999).

Applying a gender analysis within a WRM framework can further reveal the issues of sustainability: social, economic and biophysical. WRM has the potential to cross disciplines and further expand the definition of “productive” water use by valuing water as a resource which contributes to the domestic, agricultural and ecological spheres. Recognising the true value of water means acknowledging its productive and subsistence value as well as the labour of fetching and managing the resource.

2.5 Defining Gender Equity, Participation and Women’s Empowerment

The term *gender* refers to the economic, social, political and cultural attributes and opportunities associated with being male and female. In most societies, men and women differ in the activities they undertake, in access and control of resources, and in participation in decision-making. In most societies, women as a group have less access than men to resources, opportunities and decision-making. These inequalities are a constraint to development because they limit the ability of women to develop and exercise their full capabilities, for their own benefit and for that of society as a whole. The nature of gender definitions (what it means to be male or female) and patterns of inequality vary among cultures and change over time. A recognition of this variability assists in the analysis of socio-economic contexts and relationships and the possibilities for change (OECD web site, 1999).

Gender, however, is only one of many key variables defining access to and control over socio-economic and political activities (Slocum et. al., 1995). Understanding gender power structures, in relation to the control and access to natural resources may, however, provide both the context and content of women's struggles in Southern societies. The shift towards gender equity emphasises

[e]qual enjoyment by women and men of socially-valued goods, opportunities, resources and rewards. Gender equality does not mean that men and women become the same, but rather opportunities and life chances are equal. The emphasis on gender equality [equity] and women's empowerment does not presume a particular model of gender equality for all societies and cultures, but reflects a concern that women and men have equal opportunities to make choices about what gender equality means and work in partnership to achieve it... Equal treatment in the context of inequalities can mean the perpetuation of disparities. Achieving gender equality [equity] will require changes in the institutional practices and social relations through which disparities are reinforced and sustained. It also requires a strong voice for women in shaping their societies (OECD web site, 1999).

The development literature no longer "ignores the vital roles that women play in maintaining the social and ecological fabric of communities, overlooking their knowledge and experience" (Slocum et. al., 1995:5). There is even a trend to implement, in the mainstream, the commitment in the Beijing Platform for Action (1995), which states that "...Governments and other actors should promote an active and visible policy of mainstreaming a gender perspective in all policies and programs so that, before decisions are taken, an analysis is made of the effects on women and men, respectively" (UNCED, 1995. Para. 202). A gender equity mainstreaming strategy has two major aspects: 1) the integration of gender equity concerns in the analysis and formulation of all policies, programs and projects and 2) initiatives to enable women as well as men to formulate and express their

views and participate in decision-making across all development issues (OECD web site, 1999).

The purpose of empowerment and participation is to “move control over resources and institutions to disadvantaged groups, which have been excluded from such control” (Slocum et. al., 1995:5). *Empowerment* is the

[p]rocess through which individuals, as well as local groups and communities, identify and shape their lives and the kind of society in which they live. Empowerment can be experienced on an individual level or in terms of the household, local groups, community or a larger entity. Empowerment means that people are able to organise and influence change on the basis of their access to knowledge, to political processes and to financial, social and natural resources...People’s empowerment focuses on ways to mobilise local resources, engage diverse social groups in decision-making, identify patterns which eliminate poverty, and build consensus and accountability (Slocum et. al., 1995:4).

Further building on the principles of feminism, women’s empowerment is a process with intention to bring change, with the aim of redistributing power between women and men. It is by provoking a breakdown of gender biases dominant within a particular culture that a redistribution of power can be achieved by women themselves acting as agents of social change.

Effective participation is the key to the process of empowerment, which creates space for marginal or disenfranchised groups to gain access to, and become part of, the decision-making process at a variety of levels. It implies “constant readjustment and on-going information exchange, discussion, and conflict management or resolution under complex, changing and highly uncertain conditions. It involves consciousness-raising and knitting together of a ‘shared understanding of problems and a vision for the future that leads to

commitment and ownership by the community” (Slocum et. al., 1995:5). Moreover, development which encourages women’s empowerment and effective participation must move beyond practical needs and strategic interests. Only then can women themselves reveal and pursue their potential to challenge and change power distribution to one that is more equitable through the process of social transformation (Young, 1997).

Gender equality [equity] and women’s empowerment are central to the shift from welfare orientations to more [ecological, socio-economical] sustainable approaches. ...Opportunities that characterise poverty affect more women than men, and women’s efforts to overcome poverty are further constrained by discrimination in access to [formal and informal] social and economic resources. Increases in the capacity of poor women and means to shape the processes and decisions that affect their lives will require attention to the specific constraints faced by women in exercising their rights and claiming resources (OECD web site, 1999).

2.6 Analytical Framework

The mainstream Gender, Environment and Development framework (GED) suggests that the means to increase local participation, particularly of village women who previously had no official roles or responsibilities, can be achieved by integrating women into village-level institutions which govern the water resources. Drawing on the GED approach within the culture context of the Bhal, Gujarat, India, I will demonstrate its strengths and weaknesses in application to WRM. Although in both study areas of the Bhal the NGOs utilised the GED approach within their WRM initiatives, it was not always successful at facilitating a redistribution of power between women and men. Indeed, although the GED approach demonstrates a strong potential to substantially increase women’s understanding of the WRM issues, simply integrating a gender component in WRM did not always allow women to become active in the decision-making process.

The GED approach, as opposed to the other theories presented in the chapter, draws on a number of elements which enable the construction of a gender sensitive framework for analysing dimensions and implications of environmental change and redistribution of power. It stresses the need to go beyond blaming patriarchy as the cause of degradation of both nature and women. It seeks to empower women and to encourage capacity building to create sustainable communities by mobilisation at the grassroots. I believe it is essential that women and other marginal groups must *not* be represented in the literature as monolithic groups which can be 'developed' by a universally applied theory. Moreover, I see the GED approach as a blueprint, while local people themselves must use appropriate tools.

When GED is applied to the WRM framework, it draws on a number of elements which enable the construction of an integrated gender component within WRM initiatives. WRM with an applied gender analysis, encouraging gender equity, has the potential to better link management activities and decision-making institutions which govern water resources. It has the potential to analyse dimensions and implications of environmental change and redistribution of power among local women and men in the village-level decision-making processes which deal with management of local natural resources by defining new roles and responsibilities for local women and men in WRM activities.

However, as this thesis reveals, an integrated gender component within WRM is not always successful at meeting the dual goals of increasing access to and control over water resources and gender equitable participation in decision-making institutions. **In this thesis, I will argue that in order for an integrated gender component within WRM initiatives to**

be effective, there must first be a redistribution of power along gender lines, by further expanding gender roles and responsibilities in WRM activities. Moreover, it is here where women's collective actions can strive to maintain strategic common interests of the village as women become active agents of change and village leaders.

The key questions to be probed are:

- 1) Why must there be an emphasis on local women's participation and empowerment in natural resource management development projects?
- 2) How and where can women effectively participate and contribute?
- 3) What are the implications of promoting an integrated gender component within WRM initiatives?
- 4) Why must an effective WRM initiative require a redistribution of participation and power along gender lines?
- 5) How effective is an integrated gender component within WRM at reaching its dual goals of increasing access to and control of potable water, while at the same time creating an equitable power distribution?
- 6) What must happen within a village to change gender biases?
- 7) Does water source type (e.g. private versus common resources), access rights, and type of institution influence the level of power redistribution?
- 8) And, if yes, which type of WRM is best pursued in order to meet the dual objectives of creating sustainable sources while at the same time encouraging a gender equitable power distribution?

3.0 Methods: Thirst for Understanding

This thesis is a result of a larger study based on field research conducted during eight months of fieldwork (September 1997 to May 1998) in Gujarat, India. My experience and the results of the larger study led me to the topic of this thesis. Although the focus on India, community development and the feminist ecological movement was of personal and professional interest, prior to the research, I conducted no formal literature review that contributed to its rationale or guided the methodology and topics of inquiry. Moreover, it was only upon completion of my field research that much of the Gender and Water Resource Management (WRM) literature began to emerge. The drawback to this is that all of the issues raised in the Gender and WRM literature cannot be fully addressed in this paper. However, the approach to this thesis can be described as grounded theory¹ which is an inductive mode of research in which the researcher gathers data, asks questions, forms categories, looks for patterns and develops a theory or compares patterns with other theories to contribute to theory development. Thus although my approach leading to this thesis was unconventional, I believe that the results contribute to an emerging theoretical field.

As a recipient of the Aga Khan Fellowship in International Development Management (IDM) I was placed with *Utthan* (meaning ‘uplift’) and *Mahiti* (meaning ‘information’), two Gujarat NGOs, for the purpose of a professional internship opportunity. The fellowship was funded by Aga Khan Foundation Canada (AKFC) and the Canadian International Development Agency (CIDA) Youth Initiative Programme. All expenses, field staff time and

¹ For an excellent discussion on **grounded theory** see Anselm Strauss and Juliet Corbin (1990) .

in-kind support of the study itself were fully funded by *Utthan* and *Mahiti*. My role within the host organisations was to contribute to and gain from their experience and ongoing development initiatives at the village level.

Upon my arrival in Gujarat and after joining *Utthan*'s team I had an extended visit at one of the field offices, the Centre for Drinking Water Resources Management (CDWRM) and numerous rural villages where they worked. I spent two months integrating into the team and learning about issues of potable water shortage and the WRM initiatives facilitated by the NGO aimed at relieving the problems. *Utthan*'s Director, Nafisa Barot and Chief Executive, Salil Mehta, and *Mahiti*'s Director, Devubhen Pandya decided that with my background and area of interest I could best contribute to their needs by undertaking field research focusing on issues of access to and management of drinking water resources from a gender perspective. The focus of the study was to specifically examine select representative villages in which both *Utthan* and *Mahiti* were currently facilitating community-based WRM initiatives. The main initiatives at the time of the study were Plastic Lined Ponds (PLPs) facilitated by *Mahiti* and Roof Water Collection Tanks (RWCTs) facilitated by *Utthan*. Due to the relationships established between the study villages and the host NGOs, I was able to conduct a questionnaire survey and other interviews, carry out focused group discussions as well as engage in extensive participant observation. Information that was gathered was recorded in a journal consisting of extensive field notes and diagrams, along with photo documentation.

Briefly outlined below are the research methodologies which the field staff and I, the principal investigator, used:

- 1) Participatory Rural Appraisal (PRA);
- 2.) Implementation of a household level qualitative and quantitative questionnaire;
- 3.) Focus Group Discussions with various study village *Pani Samitis* (water committees) and *Mahila Mandals* (women's savings groups), and the *Bhal Samiti* (regional inter-village development committee composed of villages working with *Mahiti* only);
- 4.) Informal interviews and discussions with key informants;
- 5.) Review of internal and external documents of both *Mahiti* and *Utthan* and;
- 6.) Secondary Data, including government data, other NGO documentation and studies of the area.

3.1 Participatory Rural Appraisal

Participatory Rural Appraisal (PRA) is a “[c]ross-disciplinary, cross-sectoral approach to engage communities in development through interactive and participatory processes....It utilises a wide range of tools, often within a focus group discussion format, to elicit spatial, time-related and social or institutional data” (Slocum et.al., 1995:13). PRA and participatory research was used at the outset and throughout the study on a formal and informal basis for two main purposes: a) to scope out the issues of the area; and b) to gather specific village level data. Data was gathered such as village population size, economic position and caste structure, state of village water sources, stage and state of WRM initiative, extent of women's participation, etc. Data was collected by means of observation and key informants (field staff and villagers).

Informal participatory observation and interaction in the study and non-study villages were conducted before, during and after the interview component of the study. Due to my association with *Utthan* and *Mahiti*, I was accepted into the villages and stayed with families on regular visits and attended numerous meetings and festivities in the study villages. I attended *Pani Samiti* (water committee) meetings (village and regional), *Mahila Mandals* (women's savings groups meetings), exposure visits (by other NGOs and villagers to *Utthan* and *Mahiti*) and other everyday work of field staff in the villages. Approximately 50 percent of my visits to villages were day or evening visits consisting of 5-8 hours, the other 50 percent were overnight visits during which another team member and I would stay 1-2 days/nights at a villager's home in various study and non-study villages. Often I would participate in the domestic chores, such as sweeping, preparing dinner and fetching water. This allowed me to build relationships and trust, gather insight and reflect on the everyday life of the village.

3.2 Household Questionnaire

A pilot household survey was devised and conducted in several study villages in Coastal Bhavnagar in December 1997. Revisions were made so that the data gathered were more specific to the objectives of the study. The formal survey (see Appendix #1 for Household Questionnaire) was conducted from January to May 1998 in both Coastal Bhavnagar and Coastal Ahmedabad. The household questionnaires were aimed at soliciting responses from both women and men of select households. However, the principal respondent of the questionnaire was the female head of the household and other female family members (see below for further details on sampling). Due to the language barrier, the

field staff of *Utthan* and *Mahiti* administered questionnaires and recorded responses in Gujarati, which were later translated professionally into English. (see Figure 3.1)

The questionnaire was designed to gather both quantitative and qualitative data. The purpose of the household level questionnaire was to acquire a gender perspective on and understanding of: a) the availability and use of drinking and domestic water; b) participation in water management; c) alternative water resources initiatives (Plastic Lined Ponds [PLPs] and Roof Water Collection Tanks [RWCTs] in addition to existing water resources); and d) relationships with NGOs. The quantitative inquiries focused on water resources (sources, seasonal variability, quality and quantity) as well as management and impact of the water development project. The qualitative data focused on women's knowledge, opinion, participation and barriers to participation in the drinking water development project, maintenance, and other NGO activities in the village.

Due to the nature of village-level field research, the scope of the household was not always restricted to one female and male respondent of the household; often multiple members of the household would participate in the questionnaire interviews. It is important to note, however, that each household questionnaire sampling required at least one female (the principal respondent) and preferably one male respondent. No surveys were conducted if only a male respondent was present; however, it was adequate if only a female was present. On occasion the interview would gather a group of 4-8 household and non-household members, provoking lively discussions. This may have influenced the answers of the principal respondents of that household; however, they were still reflective of the village

situation. Due to the remoteness of villages and resource constraints, group questionnaires were used in some villages and as the sole data gathering method in one village.

3.2.1 Sampling

It is important to note that the study villages were chosen as representative of initiatives in rainwater harvesting and thus are not representative other villages within the study areas. The specific study areas were selected and defined with the primary intention of comparing common and private WRM initiatives facilitated by *Utthan* and *Mahiti*. The study villages themselves were chosen as a representative sample of the working villages of the NGOs. In total, 13 selected study villages were surveyed in the Bhal study area, 6 in Coastal Ahmedabad and 7 in Coastal Bhavnagar, 11 of which worked with the NGOs. The study village populations ranged from 600 to 2500 persons, with a maximum of approximately 350 households.

Within the defined study areas, the working NGO field staff, with their intimate knowledge of the area, assisted in choosing representative study villages with the following variables: amount of time *Utthan/Mahiti* had been working with the village, degree of success of the WRM initiative and degree of women's participation in the WRM initiative. One village in each study area was also selected which was not a working village of *Mahiti* or *Utthan*, as a representative village of the area in general. The Coastal Ahmedabad study area, consisted of 5 villages with Plastic Lined Ponds and 1 village in which *Mahiti* did not work (see Appendix #2a: Coastal Ahmedabad Sampling). The Coastal Bhavnagar study area consisted of 7 study villages, 6 with Roof Water Collection Tanks, and 1 village with which *Utthan* did not work (see Appendix #2b: Coastal Bhavnagar Sampling).

The villages and households involved in the questionnaires were chosen by the team, utilising their knowledge and familiarity with the study villages. Households were then identified and chosen at random according to variables such as caste, class, participation, location, and so on. The sample set reflected in the Appendix #2a and b set out basic conditions to get a clear representation of the study villages and individual respondent households. The total sample of formal questionnaires was $n=31$ (i.e. 31 households consisting of 31 female respondents and 26 male respondents) in Coastal Ahmedabad, all of which had access to the PLPs (whether functional or defunct, as will be discussed later). In Coastal Bhavnagar a total of $n=45$ (i.e. 45 households consisting of 45 female respondents and 35 male respondents) households participated in the household survey, of which 18 (or 40% of the households surveyed) owned a RWCT. It is important to note however, at the time of the study the actual percentage of households owning RWCTs in each study villages of Coastal Bhavnagar was less than 0.5%.

3.3 Focus Group Discussions

Focus group discussions both formal and informal were held in each study village with the *Pani Samitis* and *Mahila Mandals*. One focus group discussion was held with the women of *Mahiti's* regional *Bhal Samiti*.² The aim was to: a) gain an understanding of the role, function and capacity of the groups; b) verify the information gathered through the questionnaires; c) verify the information provided formally and informally by *Utthan* and *Mahiti* team members; and d) gather new information from active and interested villagers via group discussions. The formal focus group discussions were scheduled as part of the village

² The *Bhal Samiti* is an intra-village natural resources and development committee composed of about 40 villagers representing villages working with *Mahiti*.

Pani Samitis and study village *Mahila Mandal* meetings, while the informal group discussions took place on a casual basis during or after the meetings (see Figure 3.1).

3.4 Key Informants

Throughout my eight months' stay, informal interviews and/or discussions were held with key informants such as the field staff, support office staff and directors of both *Utthan* and *Mahiti* as well as other professionals working in the area. The purpose and aim of speaking with key informants was to seek both their professional experiences and personal insights in one or more of the following topics: WRM, gender relations, Gujarati culture, history and politics, and study area geographical information and other specifics about the area. Responses and comments of the key informants were recorded in a field journal at the time of the interview/discussion.

3.5 Secondary Data

Background secondary sources consisted of internal and external documents of both *Utthan* and *Mahiti*. Internal documents consisted of monthly reports, field staff village journals and profiles. External documents consisted of survey reports, funding proposals, annual reports and articles/reports etc. Other secondary data consisted of government documents, census data, related case studies and funding agency studies and reports. I used this information to verify data collected at the field level.

Summary

Throughout my time in Gujarat, participatory observation methodology was used in so far as I was involved in formal and non-formal activities in the study villages, the field offices of both NGOs, and the NGO administration in Ahmedabad. As an 'outsider' I was

learning and actively researching at all times. The informal interaction with the NGO staff and the villagers allowed me to learn through observing them and their lives, rather than always asking direct questions. For example, daily interaction with the field staff and villagers allowed me to see beyond my specific study topic into the reality of village life. This also helped to break down a lot of barriers and build trust. Moreover, my aim was not only to extract data from people, but also to learn through their knowledge, insights and experiences in order to contribute to the villages, the NGOs and the Gender and WRM literature.

Figure 3.1 Methods



Fieldworker with Mahiti (Binduben) conducting the household-level questionnaire with a village women in Coastal Ahmedabad.



The *Mahila Mandal* (Women's Saving Group) of Raisangadh village, Coastal Ahmedabad, Gujarat.

4.0 Research Setting: The Bhal, Gujarat, India

India, like many other tropical countries, now suffers annually droughts of increasing severity. The droughts have generally been blamed on the failure of the monsoon rains. Yet, whilst the last 3-4 years have certainly seen reduced rainfall in India, the problem of water scarcity cannot be blamed on this alone. Ecological degradation and cash crop agriculture are also to blame. In effect, the country's droughts are largely man-made (Bandyopadhyaya, 1988:88).

Gujarat, India

Environmental conditions, geographical location, erratic rainfall, hydro-geology of the region, government policy, over-exploitation of the water table and people's attitude have all contributed to the gradual transformation of the arid peninsula of Gujarat from a state of plenty to the present state of deprivation and social conflict. Gujarat State is situated on the western coast of India, with the boundaries of the state extending from the Arabian Sea in the west to Pakistan in the north-west, Rajasthan State in the north and north-east, Madhya Pradesh State in the east and Maharashtra State in the south and south-east (Ecotech Services, 1996:4). The religious make-up of the state is: Hindus 89.53%; Muslims 8.53% and Jains 1.37%. Gujarat is the ninth largest state with a total geographical area of 196,026 sq. km, approximately 6% of the total area of India. It is situated between 20.6 and 24.42 degrees north latitude and 68.10 and 74.28 degrees east longitude. The low-lying saline coastal and sandy alluvium soils along the Arabian Sea and the Gulf of Khambhat comprise one-third of the state's coastline, totalling 1,600 km. The total population of Gujarat in 1991 was 41.31 million which is approximately 5% of total population of India (Seetharam, 1995:1).

The number of villages in Gujarat without a permanent and reliable source of potable water was practically nil at the time of India's independence in 1947 (Shah, 1993:4). However, the number of government-identified 'no source'¹ villages has rapidly risen to about 4,000 in 1965, to 6,000 in 1985, to 8,000 in 1986² (Shah, 1993:25, Shiva, 1988:182). More recently a total of 14,273 of Gujarat's 18,114 were identified as 'no source' villages by the Government of Gujarat in its Master Plan for Meeting with the Drinking Water Scarcity in 1991-92 (Government of Gujarat, 1991:6). This steady increase of government-deemed 'no source' villages clearly depicts the harsh conditions villagers must face in their efforts to combat seasonal drinking water shortages due to a decreasing quality and quantity of water sources accompanied by increasing demand.

Once a village is declared 'no source', as all study villages in the Bhal are, the Gujarat Water Supply and Sewage Board (GWSSB) must take responsibility to ensure potable water is delivered to the village via pipeline or tanker truck. This system, however, is extremely problematic. First, "the definition of 'no-source' keeps changing, resulting in policy measures which are short sighted and *ad hoc*" (Mehta, 1997:83). Second, pipelines do not exist in many isolated rural areas. In areas where pipelines do exist, the pipelines deliver water irregularly or are completely defunct. Third, the system of tanker truck-delivered water and pipelines further perpetuates entrenched systemic corruption fraught with caste, political or kin favouritism. All of this cumulatively results in extreme insufficiencies in quantity, irregularities of delivery timings and quality, or no water

¹ As defined by the Government of Gujarat, 'no source' means villages where for more than six months of the year potable water sources are over 1.5 km away from the village or the water level is below 20m.

² All of Gujarat's Saurashtra peninsula was severely hit by a drought in 1985-87.

delivery at all, further leading to social and physical fights amongst women as they strive to provide for their families' basic needs.

It was as recently as the 1960's when water scarcity due to dropping water tables, increasingly emerged as one of the most alarming aspects of drought in of Gujarat (Bhatia, 1992:A-144). Since then, the degradation of both surface water and more acutely, the groundwater tables has increased dramatically, adversely impacting traditional drinking water resources in many rural villages across peninsular Gujarat. This astonishing rise in "no source" villages is a result of the combination of the dropping water table concurrently with a "gradual shift from villagers managing their own tanks [and other traditional water resources] to complete dependence on the government to deliver the goods" (Mehta, 1997:85). In years when the monsoon fails, most of Gujarat suffers severe drought. "Drought is not a new phenomenon in Gujarat...however, the nature of droughts and their impact on rural life are quite different today from what they used to be in the past" (Bhatia, 1992:A-142).

4.1 Defining the Study Area: The Bhal

The ecologically defined Bhal Region is the narrow, low-lying coastal saline region around the Gulf of Khambhat, extending from the northern part of Bhavnagar District to Khambhat, Ahmedabad District. Known locally by its ecological distinction, as the *Bhal*, meaning *forehead, where nothing grows*, aptly describes the area. The Bhal is currently experiencing a combination of four types of drought, virtually changing the landscape into a 'saline desert'. First, there is a meteorological drought linked to actual rainfall failures. Second, surface-water drought linked to hydrological de-stabilisation of river catchments

which include flash floods and reduced flow of rivers. Third, soil-water drought is linked to reduced water holding capacity of the soil due to reduced organic content, as well as high water demanding cash crops. And finally, groundwater drought is linked to ecologically unsustainable over-exploitation of ground water through pumping beyond limits of recharge. (Bandyopadhaya, 1988:88). The concern is that in both study areas the increasing drought is causing an increase in saline conditions as the sea ingresses into the ground water tables. This has resulted in potable water resources becoming saline and drying up sooner after the end of the monsoon season (See Figure 4.1).

There is an important political distinction between the two study areas of the Bhal. The study villages of Coastal Bhavnagar lie in an area which until Indian Independence (1947) was under princely feudal rule, never falling under direct British colonial rule, as opposed to Coastal Ahmedabad which was under British colonial rule. Below, Table 4.1 further defines the characteristics of the two study areas of the Bhal.

Table 4.1 Defining the Study Areas

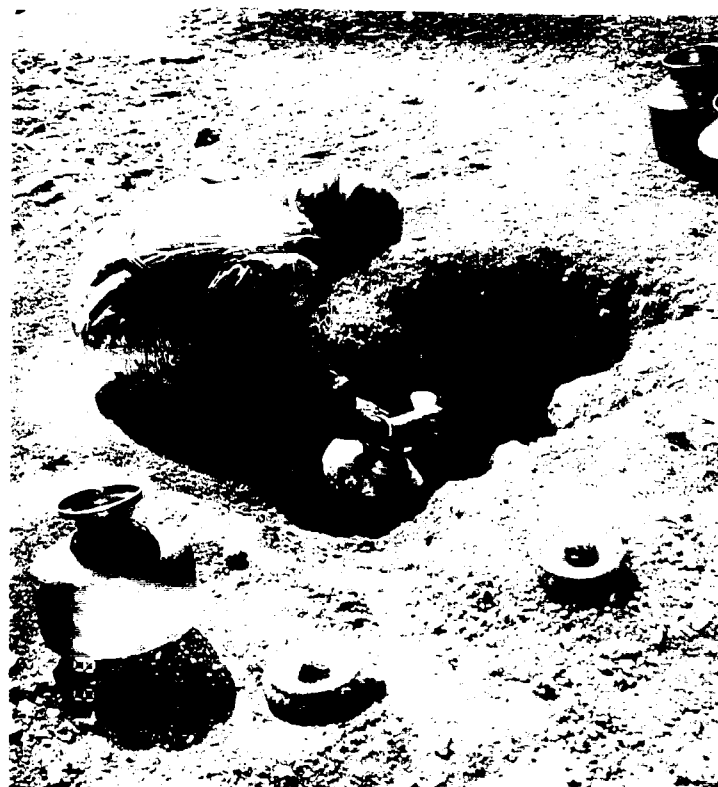
Characteristics	Coastal Ahmedabad	Coastal Bhavnagar
Historical Definition (1800's-1947)	Ahmedabad District British Colonial Rule	Bhavnagar State Princely Rule
Current Political District	Ahmedabad District	Bhavnagar District
Physographic Zone	low lying north-western coastal tract of Gulf of Khambhat	low lying north-western coastal tract of Gulf of Khambhat
Government Defined Geo-Climatic Zone	Central Gujarat (macro) The Bhal (micro)	Saurashtra (macro) The Bhal (micro)
NGO Currently Involved	<i>Utthan-Mahiti</i> (since 1982) <i>Mahiti</i> (since 1994)	<i>Utthan</i> (since 1995)
WRM Initiative Examined	Plastic Lined Ponds (PLPs)	Roof Water Collection Tanks (RWCTs)

FIGURE 4.1

DRINKING WATER SOURCES IN STUDY VILLAGES



Village women fetching water from a farm well in a study village of Coastal Bhavnagar, Gujarat (early winter).



Village woman fetching water from a *virda* (a small hand dug well in a dried riverbed) in a study village of Coastal Bhavnagar (early winter).

The study areas are located in a particularly fragile ecosystem. The degradation of the fragile ecosystem over the past two to three decades has had visible effects, transforming the landscape and the quality of life in the rural villages. Rural land use activities, increasing population and the advancing ingress of the sea are aggravating the ground and surface water salinity of this drought prone area. These are a result of a combination of natural conditions aggravated by unsustainable rural land and water use activities. The area is undergoing processes of deforestation, soil erosion, deterioration of groundwater, salinity, overgrazing, over irrigation and other biotic and abiotic stresses such as seasonal and cyclical floods and droughts (Bhattacharya, 1996:49).

4.2 Bio-Climatic Setting

4.2.1 *Geophysical Conditions*

Gujarat is indeed an area of the world that faces harsh natural environmental conditions including natural deserts, saline soil and ground water, a short heavy monsoon and high rates of evaporation. Gujarat is composed of two distinct geographical regions: first, the Saurashtra peninsula, Kutch and northern Gujarat which experience seasonal and cyclical droughts adversely impacting rural villages' water security, and second, water abundant central and southern mainland Gujarat. The Bhal study area is located at the low-lying coastal intersection of the two. Although the population density in the study areas is relatively low, the overall ecological imbalance of the Bhal has an influence on the distribution of the population and on its structure. In the Bhal, from 1971 to 1991, the population increased by 34%, which is much lower than the state average (62%) (Bhattacharya, 1996:52). This difference, however, is mainly a reflection of rural migration to the urban areas in search of paid labour. On the whole, the study villages of the Bhal are

experiencing a rapid rate of environmental change causing an acute deterioration of local potable drinking water sources, social conflict and seasonal rural to urban migration resulting in a further escalation of poverty.

Table 4.2 Biophysical Characteristics

Biophysical Characteristics	Coastal Ahmedabad	Coastal Bhavnagar
Soil Type	coastal alluvial	coastal sedimentary
Soil Condition	low to high saline	fair to rich
Elevation	0-15m	0-25m
Slope	below 5 m/km	10-5 m/km
Total Annual Rainfall	400-500 mm @ 50% dependability	400-500 mm @ 50% dependability
Days of Rain	35 days (June to Sept.)	35 days (June to Sept.)
Groundwater Table Depth	2-3 m	5-30 m
Groundwater Quality	Year round -- Saline	Aug. to Jan -- Sweet Feb. to July --Brackish to Saline
Temperature	5-50 C	5-40 C

sources: *Uthman* 1996b.

The biophysical characteristics of my two study areas, Coastal Ahmedabad and Coastal Bhavnagar are summarised above in Table 4.2. The Bhal is characterised by semi-arid to arid conditions with perennial and annual ground and surface water salinity. The land and groundwater salinity of the Bhal is due to its bowl shaped topographical formation and deposition of silt from seasonal rivers radiating from the plateau of central Saurashtra (Ecotech Services, 1996:11). This extremely low-lying, low slope landscape experiences daily tidal ingress up to 15 km inland. In this region soil salinity is so high that throughout the winter and summer the layering of crystallised salt appears to be like snow. Salt is so abundant that it is farmed and sold, exemplifying the severity of the salinity problem.

The rural study villages are highly dependent (95%) on subsistence and commercial agriculture (chickpeas, millet, groundnuts, onions, etc.) as a source of food security and livelihood (Bhattacharya, 1996:52). Acute salinity of the water tables in Coastal Ahmedabad renders the region dependent on monsoon agriculture. Villages in Coastal Bhavnagar, although they irrigate their crops, are experiencing a rapid rate of environmental change due to the dropping potable water table and are now facing similar seasonal irrigation and drinking water shortages. Heavy monsoon rains temporarily fill the aquifers with potable water pushing deeper the saline water, temporarily (3-4 months) preventing the ingress of the sea. Below, Table 4.3 illustrates the three main natural water sources and their characteristics.

Table 4.3 Natural Drinking Water Sources in the Bhal

Water Source	Characteristics
Direct Precipitation	The water accumulates in shallow depressions and ponds. In areas void of or with sparse vegetation heavy rains cause soil degradation.
Rivers	Rivers drain from the uplands of north Gujarat and Saurashtra into the study areas, causing large scale inundation during the monsoon season. Saline tidal waters also intrude up to 15 km up river.
Ground Water	The shallow aquifers (5-7m deep, localised contained aquifers) get re-charged by percolating surface water; deeper semi-confined aquifers ranging from 7-100m deep are saline and confined aquifers below 200m are highly saline (6000 to 10,000m) at temperatures of 35°C to 45°C.

Source: P.P. Patel. 1998 and *Utthan* 1996b.

4.2.2 Climatic Conditions

The climatic conditions of the Bhal can be characterised by hot summers, high seasonal aridity, high rates of evaporation, short heavy south-west monsoon rains and cyclical droughts (see Table 4.2). The Bhal experiences a short seasonal rainfall averaging

400-500 mm with an evaporation loss of 200-250 mm annually. It is also important to note that 95% of this rainfall occurs during the 3-4 month (annual average of 35 days of rain) monsoon season, starting in late June (Ecotech Services, 1994:22). The December to February period features cold temperatures followed by extremely hot temperatures from March to May, followed by the moderate post-monsoon period from October to November.

In years when the monsoons fail or bring light rains, severe droughts occur affecting all of Gujarat. "During the 1960s and 1970s in Gujarat, there were five widespread droughts (which affected more than 20 per cent of the villages), three severe droughts (which affected more than 50 per cent of the villages) and localised drought in one or more arid areas every year" (Chen, 1991:19). More recently, all of Gujarat was hit by a severe drought in 1985-87 (Chen, 1991:166). Villages in the study area experience seasonal droughts and are classified as drought-prone. This is due to the likelihood of deficient rainfall, extreme heat, loss of vegetation cover and lack of surface and ground water. The hydrologic cycle has become broken in the Bhal as the sun-baked soil is devoid of much vegetation. Since it cannot absorb the monsoon rains there is much flooding and damage to houses and roads. The rapid run-off allows for little groundwater recharge (Patel, 1988).

4.3 Cultural Setting

It is important to note that the study areas differ in historic political rule. The differentiation of the two study areas is the significant legacy of historical princely feudal rule in Coastal Bhavnagar versus British colonial rule, in Coastal Ahmedabad. As Wood (1999) indicates, this may be indicative of a more passive versus participatory political

culture.³ Moreover, he notes, “[t]aken together, the geographical, historical, social and political factors...have created...two dissimilar contexts or zones in which Gujarat’s rural development, and in particular its [state] water resources development, has occurred” (Wood, 1999:239).

4.3.1 Caste

Caste is one of the most important categories for self-identity and position within the community, and determines the social and cultural capital with which one is born. When considered in conjunction with economic class it determines a person’s access to material and non-material resources (AMANDA., 1997:9)

The people of the Bhal are mainly low-caste Hindus, often referred to as Other Backward Castes (OBC). Although fewer in number, the high caste *Rajputs*, still dominate the area economically as their legacy as “princes” before Indian Independence (1947) continues. Today there is much conflict between these two groups. Although the *Rajputs* have traditionally been the powerful caste in The Bhal, this is changing as the OBCs gather more power with their increasing dominance in agriculture and sheer numbers. The *Rajputs*, however, are still dominant due to their wealth. The NGOs discussed in this study mainly work in lower caste villages in order to help them combat the effects of impoverishment. The caste distribution of the study villages is summarised below in Table 4.5. The study villages did not include *Rajput*-dominated villages as their cultural norms forbid women to participate in labour or political activities outside of the house. *Rajput* women thus did not fetch water, nor were they allowed to participate in the *Pani Samitis* [water committees] or *Mahila Mandals* [women’s savings groups].

³ For further discussion see Wood. 1984.

Table 4.4 Caste Distribution in Survey

Caste	Category	Rank	Caste Distribution in Survey Villages of	
			Coastal Ahmedabad	Coastal Bhavnagar
Vaghri	SC	low	1	
Dalit	SC	low	1	
Bhangi	SC	low	1	1
Raval Jogi	SC	low	1	
Vankar	SC	low		1
Valand	SC	low	2	2
Talapada Koli	OBC	med		29
Koli Patel	OBC	med	17	10
Bharwad	OBC	med		2
Rajputs		high	2	
Maharaj		high		2
Sadu		high	3	1

Scheduled Caste (SC),

n=31

n=45

Other Backward Caste (OBC)

In the study areas, 80% of the population falls into what is known as the Other Backward Castes (OBC) category, prominent amongst which are the *Talapada Koli* and *Koli Patels* (Barot, 1992:35). The caste make-up of the study area includes mainly lower castes who are repressed by the wealthier upper caste *Rajputs*, who hold political and economic control over the area, especially in the Bhal. According to Nafisa Barot, director of *Utthan*, when *Utthan-Mahiti* was first in the area during the mid 1980's, "people in the Bhal [were] classified as belonging to socially and economically backward classes. According to government criteria, these people would hardly benefit from available development programs. So no government programs have been designed for the area; the people receive budget allocation left over after distribution to more powerful areas. For financial help, the people depend...on money lenders [*Rajputs*], to whom they may eventually become bonded labourers. Money lenders charge interest rates up to 120%, and thus control the lives of villagers" (Barot, 1992:35).

In much of rural India, it is common within villages to find inequitable access to water resources, especially potable water, because of social hierarchy and biases based on family, caste and class divisions. This is an important issue because of inequity which has the potential to further entrench marginalisation of individuals and groups. An individual household's access to private property water resources varies according ownership and to an individual's willingness to share a private resource. An individual's access to common property resources also varies by village-level regulations, such as caste restrictions. Thus, use of potable water resources at the village level must be measured not only in terms of quantity and quality, but also the individual household's access to the resources. Social issues of access, along with bio-physical, economic and institutional management must be fully understood and addressed when initiating WRM plans for the revival of existing sources and especially in the development of new sources.

4.3.2 Gender Relations

At the village level, women are strictly controlled by traditional rules enforced by society and families. In my study area it was common that women covered their faces in *purdha* and rarely, if ever, left the village. Women are also expected to abide by the cultural timidity or shyness called *mariadah*. This implies not speaking one's mind, especially in front of elder men. Due to the princely heritage of the high caste *Rajputs*, *Rajput* women face the most restrictive cultural gender rules such as being forbidden to leave the household compound, especially for manual labour like fetching water and fuelwood, while their girl children receive relatively high levels of formal education outside of the house. By contrast, all other non-*Rajput* caste women are expected to seek paid labour to

contribute to the household income, in addition to their primary responsibility for subsistence work such as collection of fuel, fodder and water.

Recognising that gender is only one of many variables defining access and control over social, political and economic activities, steps are being taken to increase rural women's representation in village, *taluka* and district level *panchayats* [elected local government councils] through a system of reserved seating. Until recently, women had very little representation in elected or non-elected village institutions. In 1993 the Indian government passed the 73rd Constitution Amendment, to provide 1/3rd reservation for women in the *panchayat* bodies (Seetharam, 1994:49). This meant that at the village level, women have at least 1/3 representation in elected offices and, in 1/3 of the *panchayats* a woman must be the *sarpanch* (*panchayat* president or village political leader). Accordingly, 4500 of the 13,000 village *panchayats*, 61 out of 162 *taluka panchayats* and 6 out of the 19 district *panchayats* leadership positions are reserved for women (Seetharam, 1994:49).

The reservation system is a top-down strategy by which grassroots NGOs, like *Utthan* and *Mahiti*, are trying to educate and train women to actually take an active and informed role, rather than be a substitute for their husband. It is important to note, however, that non-elected village bodies such as *Pani Samitis*, although required to by government according to WRM decentralisation policy, neither insist on the inclusion of women as members nor solicit their opinions. The reservation system is only enforced on formal elected village bodies, thus non-elected institutions such as *Pani Samitis* and Water-User Associations (WUAs) have no formal responsibility to include local women in their

membership or solicit their opinions. Encouragingly however, village women's participation in *Pani Samitis* is being brought to the forefront by NGOs such as *Utthan* and *Mahiti*.

There is still much work to be done in order to secure a gender-equitable representation in the village level decision-making institutions because there is still much resistance by the males of the villages against this new reservation policy for females. Often the elected female *sarpanch* acts only as a figurehead for her husband. For example, in one of the villages we visited, when we asked to speak with the *sarpanch*, we were told "he" was away in the town, although his elected wife was the *sarpanch*. Although this is a top-down measure, organisations such as *Utthan*, *Mahiti*, and other NGOs across Gujarat, are working in villages to educate and empower these female *sarpanchs* and other potential female leaders in the villages through daily/weekly activities and larger gatherings such as the 'Working Woman's Group', which often brings women out of their villages for the first time.

4.4 Degradation of Drinking Water Resources in the Bhal

Within the study area, the shortage of potable water in terms of both quantity and quality is a consequence of geographical formation and climatic conditions as well as the acute contemporary lowering of the potable water table caused by over-exploitation and inequitable access.⁴ Moench (1998), in his study at equity and sustainability in Gujarat's groundwater management, states "[t]he emergence of groundwater quality problems is often

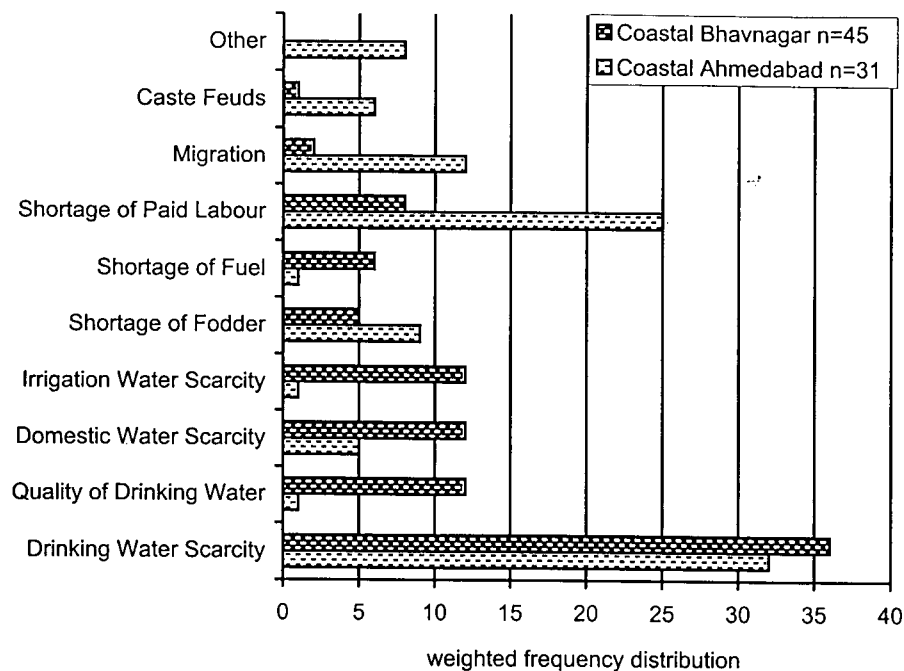
⁴ For an excellent discussion on over-exploitation and inequality of underground water resources in Gujarat see Bela Bhatia. 1992 and Marcus Moench 1992.

related to over development of the resources. Data collected by Central Ground Water Board (CGWB) and the Gujarat Water Resources Development Commission (GWRDC) indicate that saline intrusion related to over pumping affects substantial coastal areas in Saurashtra...” (Moench, 1992:A-172). Moreover, dropping of the potable water tables allows for the migration of saline water into fresh water systems. This ingress of the sea has caused many of the ground and surface water resources in the study villages to become annually saline. The result is that rural communities of this region, depicted in the study areas, are now struggling to cope with a prolonged seasonal shortage of potable water due to the increasing rate of ground and surface water salinity. Consequently, the degraded rural ecosystem has led to health problems, increased marginalisation of the poorest of the poor, and increased seasonal and permanent rural to urban migration (Barot, 1992).

The bar chart below (Figure 4.2) illustrates the responses⁵ of principal female respondents in the village household survey in both study areas, identifying the top village level problems. In both Coastal Ahmedabad and Coastal Bhavnagar it is clear that drinking water scarcity is the top problem plaguing the study villages. This is further illustrated by the fact that women contended that all other village problems stem from, or are the result of, the cumulative effects brought on by the degradation of the village-level water resources.

⁵ The ranking of the top 4 issues was given a numerical ranking of 1-4 from the given list of ten common village problems identified within the study area. In order to further quantify the responses weighted values were given using the following formula: $((\#1*4)+(\#2*3)+(\#3*2)+(\#4*1))/n*10$. This weighting may, or may not be reflective of the differentiated weighted value placed by the individual respondents.

Figure 4.2 Ranking of Village Problems by Women Villagers in Coastal Ahmedabad and Coastal Bhavnagar



Source: *Utthan & Mahiti* Gender & WRM Household-Level Questionnaire (1998)

In the study villages of Coastal Ahmedabad, the household survey respondents reported that the top village-level problems were: drinking water scarcity (32%); shortage of paid labour (25%); rural to urban migration (12%); and shortage of fodder (9%). On an individual village level, however, the priorities differed, reflecting the varying degrees of drinking water security created by the WRM initiatives in the study villages. For example, drinking water scarcity ranged from 40% to 2% in the study villages of Coastal Ahmedabad, reflecting the degree of successful or unsuccessful management of the primary water resource in the village. (For further discussion on WRM see Chapter 6.)

Raisangadh, the only village where the primary potable water source, a Plastic Lined Pond (to be discussed later), was well maintained and supplied sufficient potable water year round, reported drinking water scarcity at only 2%. Here, with the drinking water problem virtually solved, a shift in women's priorities from drinking water to economic development was evident in the concern for shortage of paid labour (42%), followed by urban-rural migration (22%). Although individual villages placed somewhat different priorities on these and other given categories, the groupings of these top village-level concerns do illustrate the present situations and concerns of the study area.

Respondents of the household survey in Coastal Bhavnagar reported the following top village-level problems as priorities: drinking water scarcity (36%), quality of drinking water (12%), irrigation water scarcity (12%) and domestic water scarcity (12%). Here, drinking water quantity and quality are clearly a major concern of the study villages, ranking drinking water scarcity from 40% to 29%. Where there was a lesser concern for the amount of water scarcity, such as in Kuda (29%), there was a corresponding shift to concern for drinking water quality (39%).

It is clear from this preliminary glimpse into the two study areas and individual study villages that drinking water is a top priority for the female respondents of the household survey. Moreover, it can be quickly established that, indeed, drinking water scarcity is the top concern for the majority of households surveyed. This preliminary overview of the village-level problems verifies the need for a deeper probe into the reasons for the persistence of the water problem.

4.5 Development and Control of Potable Water Resources

4.5.1 Historical Initiatives

Ancient indigenous rural access, control and management of water resources were based on "...traditional water rights which are often communal in nature and ensure the survival of all members of the community" (Shiva, 1991:184). It must be noted, however, that these village-level political institutions were fraught with class conflict and marginalised the lower castes. When investigating historically, it is important to note that most of the state of Gujarat (including Coastal Bhavnagar study area) never fell under direct British colonial rule. Instead, an indigenous political system of feudal rule featuring a large number of princes were in control until Indian Independence in 1947 when, one by one, they acceded to India. This long and recent legacy of feudal princely rule, was plagued by high caste (who in the case study area where *Rajputs*) rule and domination, which excluded popular participation in village-level decision making.

Throughout pre-colonised (and parts of pre-independent, such as the case study areas) India, collective participation in construction and maintenance of village-based water harvesting structures, such as ponds, wells, stepwells, and earthen bunds were undertaken to ensure sufficient water supply. Often, wealthy villagers financed the construction of water harvesting structures in order to gain religious merit. They believed that this act would venerate their family clan's gods and goddesses, so that their ancestors would emerge as mythical creatures (Mehta, 1997:85). Moreover, it helped them gain political dominance in the village.

Throughout Gujarat, the governing village-level political bodies, called *panchayats*, consisted of a male head and five to twelve village officers who acted as the tax collectors, magistrates and head farmers (Agarwal et. al., 1997:275). *Panchayats* were based on local leadership and exercised control over the access and management of local resources. According to the literature, it is clear that the *panchayat* had immense control over the resources (and water distribution) around and within the villages. Hence, *Rajput* men also had control over the money collected through water taxes and the fines for water violations, as opposed to direct control by the respective king or feudal prince, further concentrating power on caste lines (Agarwal et. al., 1997:300). Moreover, the strong gender rules forbade *Rajput* women from engaging in any activity outside of the walled household compound. Both of these legacies have continued to influence the social and political realities of village life in the study area today. However, this is rapidly changing as a consequence of democratisation, which has enhanced the power of the lower caste majority.

Historical and current environmental evidence continues to suggest that the problem of insufficient drinking water in Gujarat is not just a natural environmental phenomenon, but also one which is exaggerated by maldevelopment initiatives and political power inequities. This only emphasises the fact that *over-exploitation and inequity* are two alarming aspects of the present water utilisation and planning patterns in Gujarat (Bhatia, 1992). This seems to increase with large centralised systems and those not under the control of local governance.

[C]ommunity alienation, instigated and abetted by the pattern of development followed over the last 200-odd years, has led to an attitude that these are government assets over which the villagers have no control and, hence, no responsibility either (Agarwal et. al., 1997:325).

As suggested earlier, perhaps also there is a legacy left in the princely ruled areas of Gujarat, of a “more passive political culture”, dependent on the government (Wood, 1999:239).

When one views the history of tanks [and other drinking water sources] in the village, one sees that there has been a gradual shift from villagers managing their tanks to complete dependence on the government to deliver the goods. Unfortunately, both the state management of tanks and the principles under which the tanks are repaired and constructed are flawed as the emphasis is on short-term relief. The participation of the community in earlier initiatives was not equal; nonetheless there is today a dramatic decline in local initiatives. This dependence is likely to increase (Mehta, 1997:85).

4.5.2 *Current Initiatives*

Villagers in the Coastal Ahmedabad study area of the Bhal region were recipients of a now defunct pipeline as part of an earlier government water supply project. The pipeline's intake source is a medium dam and reservoir more than 100 kms from the tail end villages. The scheme which was initially envisaged for 52 villages, was later stretched to more than 75 villages (Barot, 1998:475). Convinced by the government, the *panchyats* believed that water would be brought to their villages and they consented to the pipeline. However, the water was extremely unreliable in timing, quality and quantity of delivery. In the best of times, each person would receive 2-3 litres of water daily. However, this was rare and resulted in physical and verbal fights breaking out over the village's single tap or holding tank. Stories like this are repeated around Gujarat, for

in principle, all the groups have the same rights over state-supplied water. Nonetheless, in reality it is the powerful -- high castes and able-bodied men -- who enjoy the best access. When piped water was supplied to the village by the government, *Darbar* [or *Rajput*] men clearly enjoyed the most clout and power and intimidated the women and the members of the lower castes (Mehta, 1995: 86)

Current Government Policy

The Government of Gujarat has published nine successive Five Year Plans in part focusing on improving drinking and irrigation water supply. Currently, the government continues activities aimed at increasing the supply of drinking water by means of deepening wells, installing hand pumps, tanker trucks and long-distance regional pipelines based on medium to large size dams and reservoirs. Until recently, the government focused only on further exploiting existing sources and did not question the governmental control of distribution, access and management.

The 1990-95 Five Year Plan and the 'Guidelines for Watershed Development' of the Ministry of Rural Development, India (1994) do, however, acknowledge the government's responsibility towards maintaining traditional water harvesting systems and the need to focus on recharging groundwater. The importance of local people's participation also figured prominently in these documents; women, however, are not mentioned (Barot, 1998:471). The focus on 'community' as espoused by the Indian Ministry of Rural Development, is supported and guided by numerous NGOs involved as Project Implementing Agencies (PIAs). The government of Gujarat has further geared up its efforts to tackle the water scarcity situation through various policy initiatives targeted not only at source development but also at better management (Ecotech Services, 1996:32).

This paradigm shift towards decentralisation and community participation is in part due to successful field experiments and lobbying of NGOs such as *Utthan* and *Mahiti*. Chapters 5 will discuss the advent and implications of this shift to decentralisation of water

resource resources. Chapter 6 will examine village-level institutions such as water committees, focusing on the gender implications and participation within the study area WRM initiatives. This work in drinking water resource development and management is primarily funded by the Gujarat Water Supply and Sewage Board (GWSSB) in conjunction with foreign development and funding agencies such as the World Bank, Royal Netherlands Embassy (RNE) and numerous local NGOs.

4.5.3 Non-Governmental Organisations (NGOs): *Utthan and Mahiti*

This thesis focuses on two participatory WRM initiatives facilitated by two Gujarati grassroots NGOs, *Utthan* and *Mahiti*. Their mandate is to create sustainable drinking water sources in villages struggling to cope with drought and salinity, with a focus on gender relations and equitable participation (see Appendix # 3 for approach and goals). Concurrently, they are seeking to empower women and to encourage capacity-building to create sustainable communities by mobilisation and redistribution of power at the grassroots, so that both local women and men have control over common property water resources. Their aim is to encourage community mobilisation and capacity-building via a gender-equitable redistribution of power within the decision-making process.

Since the mid-1980's *Utthan* and *Mahiti* have been assisting villagers in strategies to cope with social and environmental hardships in the Bhal. In the 1990's, *Mahiti* became independent and continued working in the Bhal. *Utthan*, while also lending support to *Mahiti*, started in 1995 to focus on establishing relationships with villages in the Bhal and identifying strategies to cope with potable water shortages in the Saurashtra region. The

strategic approach of both NGOs, when first establishing a working relationship in a village, was to first establish a woman's savings group known as a *Mahila Mandal*. Through information exchange, trust was built between the *Mahila Mandal* and the respective NGO. Then the NGO expanded their activities in co-operation with the villagers and their expressed concerns for community development.

Through *Utthan's* and *Mahiti's* nearly two decades of dedicated and intimate work in communities, a clear understanding has developed and attention is now being paid to the rapid deterioration of potable groundwater and the visible, socially adverse impact of environmental degradation. Their primary focus has been on the development of rain water harvesting initiatives, which will be examined in Chapter 5.

An important component of the rain water harvesting initiatives was not only village participation in the building of the resources, but more importantly the establishment of management institutions. The main means of water resource management facilitated by *Utthan* and *Mahiti* was through the establishment of non-elected village-level institutions called *Pani Samitis* or water committees. *Utthan* and *Mahiti's* not only created an integrated gender component within the WRM initiatives, but also encouraged women's equitable representation and participation in the village *Pani Samitis*. Chapter 6 will focus on the experiences and impacts of village women on the *Pani Samitis* and other WRM initiatives women have undertaken.

5.0 Searching for Drinking Water in a 'Saline Desert'

Unsustainable development, in the already fragile drought prone and saline affected region of the Bhal, has virtually turned the area into a 'saline desert' (Barot, 1992, Bhattacharya, 1997, Ecotec Services, 1996,). Potable water shortage characterised by over-exploitation and inequitable access has left many rural villages located in this north-eastern coastal belt of the Saurashtra peninsula of Gujarat to cope with the consequences. In the Bhal, natural potable water sources often are attached to ancient legends recognising the precious gifts they bear. Distinguished by small temples or markers engraved with the goddess of the Ganga or the Narmada, they are holy places where one can fetch potable water and worship.

One of my study villages known locally as *Mithi Virdi*, the place with 'sweet small water holes' has in the past decade or two lost the virtues of its name. Now labelled by the government as a 'no source' village, the State no longer recognises it by its traditional name. Recognising the same water shortage that has plagued other the study villages, I asked the significance of Mithi Virdi's name. One villager told me to return to his house in a couple of hours and he would show me. Later that day, I returned to his house and he led me about one kilometre to the seaside. There the retreating tide revealed what I had not seen earlier. An elaborately carved gravestone-like marker and a now headless horseman, sat amongst the tidal pools on a small area of bedrock on this otherwise sandy beach. About ten meters from the shoreline, scattered about the base of these holy markers were shallow plate size divots called '*virda*' or '*viridi*'. As man bent down splashing sea water out of the *virda*, water

quickly rose from below. Scooping and cupping his hand to his mouth he eagerly motioned for me to drink the water. Much to my surprise, here along the seashore in the tidal retreat, sweet water flowed.

Later upon inquiry, I learned that just a decade before these sacred spots which scatter the shoreline of Coastal Bhavnagar provided villages with sweet water throughout the year. Now sweet water only rises from these seashore sites one or two months after the retreat of the monsoon. Over-exploitation throughout the Saurashtra peninsula in the past two to three decades has caused the water table to drop rapidly. Consequently the low-lying seaside villages of the Bhal, receive little freshwater draining from inland Saurashtra, causing the sea to ingress, polluting the few sub-surface sweet water sources available. Throughout the Bhal study villages seasonal ground water salinity has become so severe that soils have also become saline. Even those villages which have historically depended on natural ponds to collect rainwater, have also seen increasing soil salinity turn these potable water sources saline and dry up sooner after the monsoon (Agarwal, et al. 1997, Patel, 1988).

Village women spoke of personal stories and sang folk songs which clearly depicted how brackish and saline water plagued not only the health of their families but also social relations between women themselves. A poor *Dalit* women told me of having to sell her family's only water buffalo. "It was our only source of milk, to make buttermilk, ghee, and other staple foods, now we will have to purchase them. But we had to, I could not stand to see it suffer from only drinking saline water, anymore." In the village of Kuda, families could not find wives for their sons because other villages did not want to send their daughters

to a hard life of searching for sweet water to end up only drinking brackish water. I even recorded women singing traditional folk songs about their struggle to find sufficient drinking water. One jovial song they sang to me, *Nathiben* [*sister Natalie*], was a blessing that I would marry into a good family and a village with plentiful sweet water. In every village I visited women repeatedly told me of verbal and physical fights between women over *hails*¹ of water.

In this section I will examine access to and use of available potable water resources and illustrate the study villages' struggle to cope with seasonal shortages and salinity. The water sources of the study villages include natural or traditional sources and modern sources; however special attention will be drawn to the water resource development initiatives of Plastic Lined Ponds (PLP) and Roof Water Collection (RWCTs), facilitated by the respective NGOs illustrated in this study.

5.1 Labour and Social Related Gender Implications

In the Bhal, as in much of India, women and girl children are the primary fetchers of potable and domestic water for their households. Environmental degradation in the already drought prone and saline affected areas of the Bhal has adversely affected the access to sufficient potable water at the village level. Inadequate supply, poor quality and seasonal shifts in access to water sources result in social pressures causing conflicts between women for *hails* of water. As it is village women who bear the load of *hails*, the deteriorating access

¹ *hail* : A container to fetch, carry (balanced on women's heads) and store water in rural India. One, in a series of three (large, medium, small) constructed out of stainless steel or earthen clay. One large *hail* holds 15 litres, a series of three *hails* holds 25-30 litres of water. The weight of the series of three *hails* is 35-40 kg depending on the material of which it is constructed. The height of the three balanced on top of each other is approximately 1 metre.

to potable water supply has gender implications connected to the time and energy taken to fetch water.

In the household surveys and focus group discussions with *Mahlia Mandals* of the study villages, women reported that, throughout the year, 1-3 women or girl children, from ages 8 to 60 years, are responsible for fetching their entire households' needs for potable and domestic water. On average, a woman (in her late teens to late thirties) can carry 3 *hails* (containing 35 litres) on a single trip from source to home. This means one to six trips per day for each household. These trips may be made by one or more women or children of the household and the number of trips varies according to the age and/ or health of the women.

There are only a few notable exceptions to this gender division of labour. First, in the *Rajput* caste, girl children and women are forbidden to participate in labour activities outside of the house. This exception is a historical social legacy of *Rajput* high caste dominance. *Rajput* respondents of the household survey reported that they either hire other caste women of the village to fetch the water, or the male members of the house may also perform this task. The second exception noted in the household surveys was during the summer months when males concurrently participated in the task of fetching water. Male labour, however, was limited to fetching water at distant sources in other villages or towns. This was due to two main reasons. Traditionally, the majority of village women in both study areas rarely left the village and surrounding farmlands. In the summer months, however, women did report walking long distances to fetch water from outside sources. These were areas they usually did not venture to at other times of the year. Second, due to cultural gender rules, only men

could take a bicycle or an ox cart to fetch water from distant sources in other villages and towns. This trend in both study areas, however, was reported only in villages facing severe potable water scarcity either in quantity and or quality.

Village women reported that their role as fetchers of drinking and domestic water consumed much of their time and energy and, in turn, had a negative impact on them, their families and overall village-level economic well-being. Although the amount of time, energy expended and tension reported varied seasonally, the impact on the women's lives can be classified in the following categories: *Physical; Mental and Emotional; Social and Economic*.

The majority of women reported the following adverse affects on their health due to the deterioration of water resources. All the women reported "*head and body aches*", which they defined as "strain" and "pain". These physical symptoms were mainly due to the heavy loads of water the women carried during multiple trips, day in and day out. The women repeatedly explained the extreme seasonal variation difficulties of physically fetching water in the monsoon, winter and summer. In the summer heat of 45°C, women wait in long queues at the wells or riverbeds for 4 to 8 hours, ironically, without enough water to drink.

Many social problems caused by mental and emotional stress revealed themselves during times of scarcity. This stress lasted from mid-winter (January) through the summer and did not ease off until mid-July welcomes the monsoon rains. Coping strategies in late winter and summer resulted in high tension among the villagers, especially the village women. In the late winter and throughout the summer, many women stated "there are

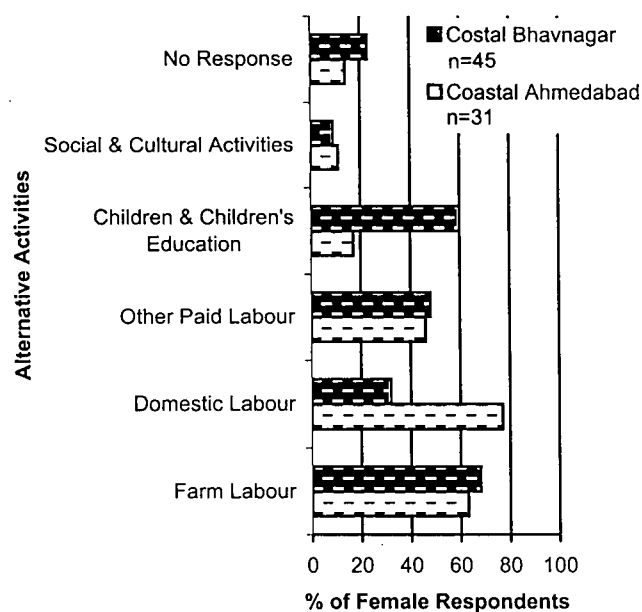
quarrels [over water] and thus social relations and physical and mental health are disturbed. So we go fetch water at night.” Within villages and between villages, verbal and physical fights are common between women waiting in queues or struggling over the last *hails* of water.

Economically, the gender labour implications run beyond the task of fetching water into the forgone hours of missed paid labour opportunities. Due to the fact that odd or late hours are spent fetching water, it is difficult for women to take on paid labour. “We can’t go for labour work because in the summer we must wait in the village for the tanker to come...if it does at all.” Women’s non-participation or seasonal withdrawal from wage labour not only decreases total household income, but also may mean a decrease in women’s roles in the household decision-making process (due to her inconsistent or lack of economic contribution to the household). Many women and men pointed out that in times of severe water scarcity “...no labour jobs are available due to the lack of potable water.” This further explains the women’s stated top problems of the village as discussed in 4.4. For example, in Raisangadh the success of the WRM initiatives which led to drinking water security, women in turn were able to focus on the problem of scarcity of paid labour. Women also stressed that children’s education was often neglected, in that “girl children’s education is difficult because they must help fetch water and/or look after younger siblings while women fetch water.” Women were also quick to stress that it was not only women who were adversely affected by the deterioration of the water resources, but “our entire family and village suffers.”

5.1.1 Women's Priorities

The above discussion on labour and social gender implications relates back to female respondents' expressed concerns of top village problems (see 4.4 discussion and Figure 4.2). which also reflect their priorities for their family's well being. Below in Figure 5.1 I have presented the preferred alternative activities which female respondents reported they would pursue *if* their household was benefiting from the respective WRM initiatives.

Figure 5.1 Activities Foregone Because of Time Required to Fetch Water



Source: *Utthan & Mahiti* Gender & WRM Household-Level Questionnaire (1998)

Here womens' preferred activities can be understood and are rooted in women's priorities for community development initiatives aimed at household and village well being. For example, the female respondents in both Coastal Ahmedabad and Coastal Bhavnagar reported that if they had more time to pursue activities other than fetching water they would

direct their energy towards the following activities in the respective study areas: domestic labour (77% and 32%); farm labour (63% and 68%), and other paid labour (46% and 49%). Although these activities reflect subsistence and economic activities, woman also placed priority on decreasing children's labour so that they could pursue an education. Female respondents in both study areas placed a lesser emphasis on time spent in social and/or cultural activities. In understanding these priorities, *Utthan* and *Mahiti* were able to facilitate concurrent community development initiatives, such as the women's savings groups or *Mahila Mandals*, which enhanced the WRM initiatives and led to other activities aimed at poverty reduction.

5.2 Availability of and Access to Potable Water Sources

The potable water sources in both study areas mainly consist of natural or traditional sources such as ponds and wells. These sources, however, are not functional year round as they vary in quantity and quality from season to season. Below, Table 5.1 illustrates the main potable water sources and their characteristics (also see Figure 4.3). Annually, these village-level sources are recharged by rain water and are thus dependent on the strength and duration of the monsoon. Many of the water sources are sufficient in quantity and quality during the monsoon and into mid-winter season. However, these surface and shallow subsurface sources become saline and dry up well before the dry hot summer season even begins.

Table 5.1 Seasonal Potable Water Sources in the Bhal Study Areas

Bhal Study Area	Study Village Primary Potable Water Resource		
	Monsoon	Winter	Summer
Coastal Ahmedabad	-ponds -direct catchment -PLP -pipeline	-ponds -virdas -pipeline	-virdas -pipeline -tanker trucks
Coastal Bhavnagar	-village wells -ponds -rivers -farm wells	-village wells -ponds -virdas -farm wells	-farm wells -RWCTs -tanker trucks

5.2.1 Available Water Sources

Coastal Ahmedabad

Potable water resources in the study villages of Coastal Ahmedabad consist mainly of natural ponds, although modern sources such as pipelines now also exist (see Table 5.1). Many of the study villages' natural or traditional sources, mainly ponds, are seasonally and/or annually not suitable for drinking water because they either dry up or have poor quality water during the winter and summer seasons. Subsequently, these sources may be used for domestic purposes, such as bathing, or washing clothes and livestock. The non-traditional common resources, such as the government pipeline and tanker trucks are extremely erratic in supply timings as well as water quantity and quality. Historically, there are few natural private water resources in the study villages and in the area in general. The alternative sources are accessible only in times of scarcity and are all open access common property resources, shared by villages and accessible to anyone in the area. These include both traditional sources such as ponds belonging to temples and government sources, such as tanker trucks and key standposts along the pipeline. The study villages have been deemed

“no source” villages, thus the state government provides tanker trucks to deliver potable water to villages during times of scarcity; however, this service is extremely unreliable.

The Plastic Lined Ponds (PLPs) initiative, introduced by *Mahiti* in the early 1990's brought a new drinking water resource to the study villages in Coastal Ahmedabad. These PLPs are common property sources with common access to all villagers. As I will discuss later, these PLPs have had varying degrees of success in terms of potable quality and sufficient quantity for the respective study villages. More recently, *Mahiti* has also expanded into field experiments with Roof Water Collection Tanks (RWCTs). The WRM initiative focus of this study area, however, will only be PLPs.

Coastal Bhavnagar

The study villages of Coastal Bhavnagar have many more potable water resources because they are able to tap into a shallow fresh water table. Many of the natural or traditional village sources such as open wells, stepwells, ponds and farm wells, however, are seasonally and/or annually not suitable for drinking water because they either dry up or have poor quality water (see Table 5.1). As mentioned above, the alternative use of these sources for domestic purposes, such as bathing, washing clothes and for livestock consumption and bathing, are also seen as a vital resource for the village. Historically, there have been no natural private water resources in the study villages other than numerous farm wells which access potable aquifers. The alternative sources reported to be used by villagers in the study villages are all restricted access private property farm wells at greater distances from the village. These are accessible only in times of scarcity (ordinarily late winter and summer) and only with permission from the owner. Currently, no long distance government pipelines

exist in Coastal Bhavnagar. The study villages in Coastal Bhavnagar have also been deemed “no source” villages and villagers reported the same irregularity of the government tanker trucks.

The recent introduction of Roof Water Collection Tanks (RWCTs) as a drinking water resource for the study villages in Coastal Ahmedabad is indeed a viable alternative for the area. These RWCTs are, however, limited in solving the drinking water problem on a village level because they are a private property resource, with private access, and it is not economically possible for each and every household to build one. At the time of the study, a minimum of 5 and a maximum of 18 RWCTs, in the respective study villages were completed and in use. The government had sanctioned more RWCTs to be built the following year. The RWCTs are limited by seasonal access as they are designed to store monsoon water, sufficient for the individual household for four months of summer.

5.2.2 Access to Water Sources

For the purposes of discussion I have grouped the main sources of potable water in the study villages of the Bhal into these three main categories based on access (Ostrom 1990): *common property with common access*, *restricted access* (both common and private property) and *private property with private access*². I have grouped both common and private restricted access sources into one category because access varies due to caste restrictions and by seasonal need.

² For further discussion on access rights to common and private natural resources Elinor Ostrom (1990).

Common property water resources with *common access* means that all households within the village have unrestricted access for all village residents. However, there may be rules of conduct imposed for management purposes. In the study villages common property resources include the following: a) natural or traditional sources such as ponds, village wells and *viridas* (small to medium hand dug wells), b) modern sources such as Plastic Lined Ponds (PLPs) and c) government sources such as pipelines, hand pumps and tanker trucks which deliver water to the villages.

Second, both common and private *restricted access* resource users must deal with the following issues. In many rural villages throughout India, common property water resources have access restrictions based on caste prohibitions. In the study villages, however, water sources generally were reported not to have such restrictions since the populations were mainly comprised of Scheduled Castes (SC) and Other Backward Castes (OBC), which generally impose fewer caste restrictions with regard to sharing water resources. In areas where caste bias imposes restrictions on access to these sources, a discussion of the implications will be included. It was generally reported by the villagers that rules of access to farm wells are imposed by landowners, who grant permission for access to individual households. Because of social biases held by individual landowners, there may be variation from farm well to farm well and from village to village. As discussed below, household access to these farm wells also varies by season. As drinking water becomes more scarce and the quality of the common property sources decreases, village-level dependency on restricted access sources increases.

The third category of access to water resources is *private resources with private access*, consisting of a) Roof Water Collection Tanks (RWCTs), b) household taps from government pipelines (all defunct or extremely erratic), c) private tanker trucks hired by individual households, and d) private farm wells used only by the landowner and his family. In both study areas, other than specific farm wells in Coastal Bhavnagar, private resources with private access are generally a modern concept, evolving out of increased water scarcity and increased disparities between the rich and the poor.

When searching for viable solutions (ecologically, technically and socially) to the water scarcity problem, it is vital that issues of access to (supply) and uses of (demand) village-level water sources be examined. Finding appropriate solutions is also important for government and donor agencies which have limited financial resources available.

5.3 Community Water Resource Initiatives: Rainwater Harvesting Structures

The study villages in the Bhal currently depend on a mix of traditional sources, such as natural ponds, seasonal rivers, dry river beds, shallow wells, and modern sources such as pipelines, hand pumps, and water tanker trucks. Due to the degradation of these water sources and the expressed concerns of women in the study villages about potable water scarcity and its direct connection to other village problems, the NGOs began to work co-operatively with the villagers to come up with viable solutions. Given the geophysical limitations, the climatic conditions and the increasing salinity of the surface and groundwater tables in the study areas, rainwater harvesting evolved to be the most appropriate and feasible alternative water resource.

Recently there has been a rise in NGO advocacy for the government to explore the viability of rainwater harvesting as a partial solution to rural Gujarat's drinking water shortages. Stemming from such NGO initiatives, Plastic Lined Ponds (PLPs) in Coastal Ahmedabad (late 1980s) and Roof Water Collection Tanks (RWCTs) in Coastal Bhavnagar (late 1990s) have become alternative sources of drinking water. NGOs like *Utthan* and *Mahiti* are urging the Gujarat Government and international donor agencies to diversify development projects and fund community-built, small-scale, decentralised water harvesting structures.

It is argued by P.R. Pisharoty, one of India's leading meteorologists, that as harsh as the coastal Gujarati environment may be, there is sufficient water to sustain Gujarat's entire population (Agarwal et. al., 1997:314). He points out, "there is almost no area [of India] where rainfall is less than 100 mm annually, and even this is sufficient to meet local drinking water needs, provided it is harvested properly when it falls" (Agarwal et. al., 1997a:314). It is important to note, however, that the rainwater harvested is only adequate *if* managed and distributed equitably. Shah, another advocate of rainwater collection initiatives notes that,

[p]resently most of the rainwater goes to waste. Moderate downpours lead to formation of scattered shallow ponds which evaporate in a short time and heavy downpours cause flash floods. With large scale implementation of decentralised small rainwater harvesting schemes, it would not be difficult to collect 20% of the rainwater (Shah, 1993:19).

Studies and remaining indigenous knowledge have proven that people who lived in the study area before this century met their water needs by means of these natural sources and by using ancient technologies of rainwater harvesting.³ These technologies were

³ For a discussion on traditional rainwater harvesting in India see Anil Agarwal and Sunita Narain, 1997.

appropriate to the geo-climatic and demographic environments in which people lived. During Gujarat's severe droughts of the 1980's and 1990's, remote desert villages that had no access to state-supplied water and did not suffer as severely as those that did because they properly maintained their traditional rainwater harvesting structures (Agarwal et. al. 1997). However, due to increased dependency on government sources such as pipelines, many of these traditional methods have been lost.

The NGOs illustrated here believe that spending more money on large-scale centralised modern water resources is not a sustainable solution to current and future potable drinking water needs of the area if community based rainwater harvesting structures are also not concurrently funded and encouraged. Ultimately, the drinking water crisis is more than an environmental crisis producing a shortage, it is also a political struggle over access to, and control over drinking water sources.

5.3.1 Common Property Resources: Plastic Lined Ponds (PLPs)

Traditionally, as well as in the contemporary Bhal villages, natural ponds are the primary water source for people and livestock. Villages are identified by their pond, in that many of the names of the villages include the word *talav* (meaning *pond*). Over ten years ago, when *Utthan-Mahiti* started working in the area, the villagers identified a lack of drinking water as one of their largest problems. The NGOs and the villagers started to work co-operatively to find a feasible alternative water source. Due to the high salinity of the soil, one solution proposed by the villagers was to line the village pond with large sheets of heavy plastic to prevent the water from turning saline. This idea derived from their participating in

a government labour project in which they were digging irrigation canals and lining them with plastic to prevent water loss.

The idea seemed plausible to all involved so a feasibility study was done and engineering designs drawn up. Funding was provided for the first seven experimental ponds by the World Bank in 1985. After the first seven ponds were built and had endured the test of the first working year, the state government agreed to fund more PLPs in the area. Presently there are 21 ponds in a total of 20 villages working with *Mahiti* in the Bhal. For purposes of this study, five of the six study villages which have PLPs will be examined. The table below summarises a compilation of village women's perceived direct and indirect benefits of PLPs at the village level.

**Table 5.2 Benefits of PLP:
Compilation of Womens' Responses (Coastal Ahmedabad)**

	Direct Benefits	Indirect Benefits
Village Level	<ul style="list-style-type: none"> -sweet/clean water available -sufficient potable water -greater awareness of water issues -water is not wasted -no need to go out of village for water -all village members get water -save time -peace in village and at home 	<ul style="list-style-type: none"> -stop/decreased migration -able to do farm labour -can do income generating activity -can get education for children -have no conflicts -health improved -mental relief -can do housework -better rested -can focus on other issues & build community

Source: *Uithan & Mahiti* Gender & WRM
Household-Level Questionnaire (1998)

n=31

To ensure a sense of ownership, the villages were required by the World Bank and Gujarat Water Supply and Sewage Board (GWSSB) to contribute 20% of the cost of the project via their labour. Community involvement varied by village and in phases (planning,

implementation and construction of the ponds), mainly due to inappropriate timing deadlines imposed by funding agencies⁴. For the most part, however, villagers co-operatively selected and excavated the sites. The engineering details of the pond design took into account factors of water requirement, evaporation losses, depth and side slopes of the water catchment and storage pond. Typically, an area of 55 m by 55 m by 4 m was excavated and lined first with a layer of heavy plastic, then overlaid with bricks (Patel, 1988).

The ponds were built to hold sufficient water for villages with an average population of 1,000 people (at 10 litres a day for 250 days of the year, i.e. not to include the monsoon season when sufficient water is accessible) plus livestock (cattle and water buffalo). Economically, the ponds require a high capital cost of approximately Rs. 1 per litre for the estimated 20 year life span of the pond (*Utthan*, 1995). This does not including yearly maintenance costs, which are the responsibility of the village.

Less than eight years after their construction, the ponds have experienced both successes and failures with village management and other technical problems. The problem of high evaporation rates persists. Different experiments have been tried, ranging from vegetative to chemical coverings. In terms of the PLPs being effective and equitable, they were for the most part technically successful at bringing potable water to the area and socially viable, with high levels of community participation, especially by women. Due mainly to poor maintenance and inter-village politics (for further discussion see Chapter 6),

⁴ Personal communication with Nafisa Barot, Director of *Utthan*, November 1997.

many of the PLPs are in a state of deterioration and are becoming or have the potential to become saline due to side bank erosion.

5.3.2 Private Property Resources: Roof Water Collection Tanks (RWCTs)

Roof Water Collection Tanks (RWCTs) are a traditional water harvesting technique once common all over India, and still present in some towns and rural villages, including the study area. RWCT technology simply directs monsoon rainfall from the roof of a dwelling into a gutter system leading to a holding tank. The storage tank can be above or below ground, and can be made of brick or metal. In saline, drought prone areas like the Bhal, the rainwater is stored in the holding tank until all other sources are exhausted. This is an important distinction because RWCTs, as opposed to Plastic Lined Ponds (see discussion below) and other natural sources, are only a source for times of absolute water shortage and cannot be used throughout the year. At the individual household level in the study villages it is economically unfeasible to construct a larger tank (Hirway and Patel, 1994).

Few conclusions can be drawn in this study area regarding the impact of RWCTs because, at the time of the study, although *Utthan* had been working in the study villages since 1995, the first phase of RWCT initiative had only been completed a year previously. Moreover, in the study villages, a maximum of 18 (or 7% of households in the village) and a minimum of 3 (or 1% of households in the village) RWCTs were present and in use at the time of the study. For purposes of this study, a high number of surveyed households (36%) had RWCTs. It is noted that elsewhere, the technology has been proven effective and

requires little maintenance. Table 5.3 summarises a compilation of village women's perceived direct and indirect benefits of RWCTs at the household level.

**Table 5.3 Benefits of RWCT:
Compilation of Womens' Responses (Coastal Bhavnagar)**

	Direct Benefits	Indirect Benefits
Household Level	<ul style="list-style-type: none"> -water accessible in summer -high quality water -storage of water for marriage and other celebrations -less household members required to fetch water in summer -less distances travelled -water filled irrespective of time -women will not have to carry water on their heads 	<ul style="list-style-type: none"> -able to go for paid labour due to time saved -less mental tension -children can go to school -women's health will improve -able to complete house work and go to farm -time for relaxation - family will be more peaceful

Source: *Utthan and Mahiti* Gender & WRM
Household-Level Questionnaire (1998)

n=45

In the study villages, the RWCT systems were designed by *Utthan-Mahiti* and implemented and built by the community members. The tanks vary in size, holding sufficient water for the dry four months of summer, at 10 litres per day per number of individuals in a household, working out to a cost of Rs. 0.35 per litre for the life span of the tank (*Utthan*, 1995). It is important to note however, that this water source is only used in times of severe scarcity (4 months of summer) and other alternatives must be developed concurrently. To be sure the water stays clean and safe for drinking; households are responsible for painting the inner tank with calcium carbonate (a natural antiseptic) and keeping the tank clean. Both *kacha* (made from natural materials) and *pacca* (made of bricks) houses are suitable for collecting roof water.

It is important to note, however, that RWCTs are attached to an individual house, and are therefore a Private Property Resource (PPR). This raises questions about the inequity of the project. The government cannot afford to build every household a RWCT in order to supply four months of water. Although the sustainability of the RWCTs has been proven in ancient times and is still a reality in towns near the Bhal, as a modern technology it brings new social problems, primarily of inequity. Ultimately, only those who can afford it can have an RWCT.

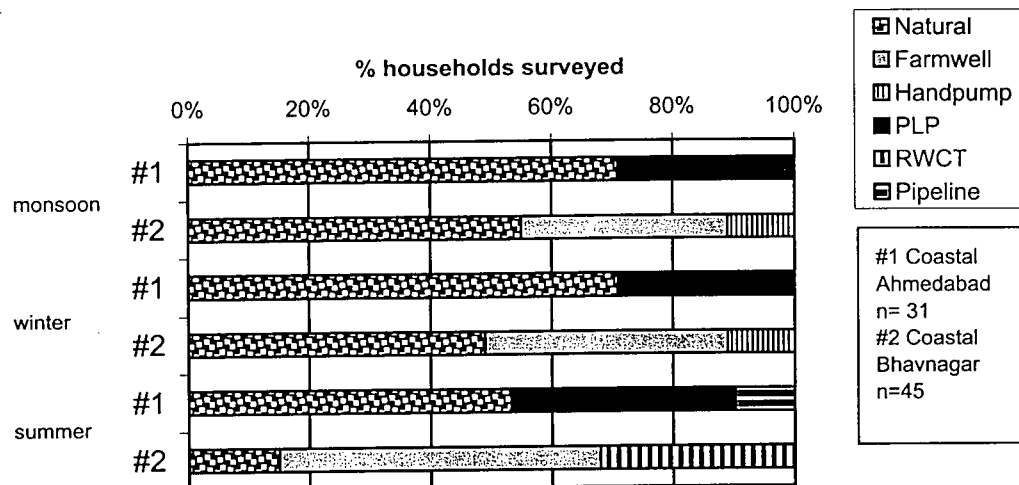
During the planning and implementation phases of the project, both men and women were involved in the formation of a village water committees. The members of the water committees decided that RWCTs were a viable experiment and determined who would be the beneficiaries. Due to the inherent politics of villages, the rich higher caste households, who were members of the water committees, became recipients of many of the RWCTs. However, because of *Utthan's* involvement and influence in the village, poor lower caste households were recipients of at least 1/3 of the total tanks constructed in each study village.

5.4 Use of Potable Water Sources

In the household survey, respondents were asked which of the potable water resources in the village they used daily as their primary source and how that changed by season. Primary potable sources were defined in terms of the largest quantity (in litres) fetched from a source compared to other sources which they might use concurrently, for drinking or other domestic purposes. Figure 5.2 illustrates the percentage of households in Coastal Ahmedabad and Coastal Bhavnagar using various primary water sources. The purpose of this chart is to show how the surveyed households in both study areas are

dependent on specific sources by season. The seasonal shift to different sources and the percentage of households dependent on them, are important factors to consider when analysing issues of access and the development of WRM initiatives and management schemes.

Figure 5.2 Surveyed Households Using Various Primary Water Sources



Source: *Utthan and Mahiti Gender & WRM Household-Level Questionnaire (1998)*

Household survey respondents in Coastal Ahmedabad reported that during the monsoon and winter seasons, 71% of households used natural ponds, and 29% used PLPs as their primary source of potable water. These traditional sources and the PLPs are all common property resources with unrestricted access for all village residents. It is important to note that although all but one of the study villages in Coastal Ahmedabad have PLPs, for reasons of poor management (as will be discussed in Chapter 6), they are all defunct, except in the villages of Raisangadh (all three seasons) and Rajpur (summer only). Therefore, the reported use of PLPs is only representative of surveyed households in these two villages and the other

study villages rely solely on natural sources. In the summer season, when natural ponds contain little to no surface water, the number of households dependent on natural sources decreases to 52%. During this time of the year water is fetched from natural sources by digging holes by hand [*viridas*] in the dried pond bed. This water, however, was reported to be of very poor quality due to salinity. In the summer the use of alternative, non-traditional sources such as PLPs rises to 36%. The use of the government sources (10%) was only reported in the summer and by survey respondents who had access to no other sources and/or by those who had the means (i.e. cycle, oxcart or tractor) to get to distant government pipeline standposts, where a higher quality of water could be fetched. This number does not include government tanker trucks as no respondents reported them to be their primary water source. Although all villages have access to government water sources such as pipelines and tanker trucks, few villages reported these sources as their primary source due to distance and the erratic supply.

The household survey respondents of Coastal Bhavnagar reported that during the monsoon, 55% used a variety of traditional sources (natural ponds, village wells and stepwells), 34% used farm wells and 11% used common property hand pumps, as their primary source of potable water. Although there are a few private hand pumps in the study villages, they are only used in the monsoon and early winter seasons. Similar usage patterns were reported in the winter season, with only a slight shift to greater use of farm wells. In the summer, the dependence on the farm wells increased to 53% of the households, while traditional sources (primarily *viridas*) dropped to 15% as they are more likely to be of poorer quality due to variable levels of salinity. This shift reflects the rapid deterioration in quality

and quantity of the village traditional sources. RWCTs (32%) have the potential to ease some of the pressure on those who have these new sources at their homes. It is important to note that this is an over-representation of the actual percentage of households in the study villages which have RWCTs. For purposes of this study, a high number of surveyed households with RWCTs were specifically chosen. In the study villages a maximum of 18 (or 7% of an entire village, including non-surveyed households) and a minimum of 3 (or 1% of an entire village, including non-surveyed households) RWCTs were present and in use at the time of the study.

5.5 Gender Differentiated Preferences and Common Interests

The gender and WRM literature focuses on differences in opinion about resources development and management based on gender preferences, interests, and incentives rather than on complementary and common interests. In the two study areas, however, the household survey revealed that women and men participating in the household survey had very similar preferences and common interests in developing potable water sources in the respective study villages.

5.5.1 *Multiple vs. Single Use Water Resources*

In both study areas there was a distinct separation between sources for potable and domestic water. This was to ensure that the drinking water be kept sanitary. Due to the scarcity of both potable and domestic water, however, this was not always possible. In the household survey, 100 % of the men and women in both study areas reported that it was necessary to keep this distinction. It was reported by villagers that potable or sweet water was fetched from sources of the highest quality available and used strictly for drinking and

cooking purposes. These sources were mainly common property resources with common access or private with restricted access. Potable sources consisted of natural sources such as ponds, *virdas*, open wells, and farm wells. The remaining water sources near the village were of poorer quality and used for domestic purposes, such as bathing, washing of clothes and vessels, and livestock bathing. Those domestic sources which were not too saline were also used for livestock drinking water.

5.5.2 Common vs. Private Water Resources

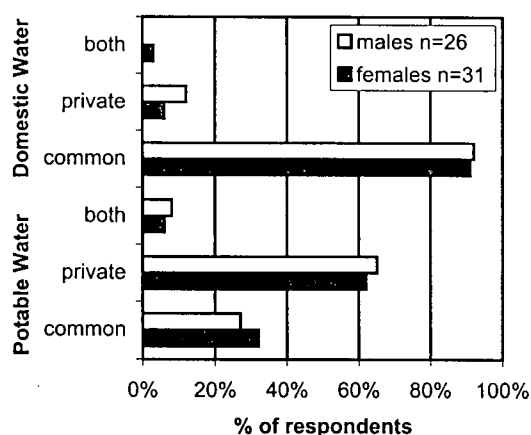
In both study areas common sources generally included ponds, rivers, village wells and common standposts off a pipeline. Private sources consisted of a tap in each household off a pipeline, RWCTs and, in some villages of Coastal Bhavnagar, hand pumps. Below, Figure 5.3 presents the responses of both female and male respondents of the household survey when asked about their preferences for common versus private water resources, for both potable and domestic purposes.

In both study areas, over 90% of the women and men prefer common domestic water sources. This is reflective of the nature of its use for washing clothes and vessels, and for livestock drinking and bathing. In Coastal Ahmedabad, both women (62%) and men (65%) preferred private potable water resources. Here, the majority preference for private potable water sources is an interesting response for a number of reasons. First, from a historical perspective, there are no private water sources in the area. Second, the majority response is perhaps a reflection in the villages with defunct PLPs which do not provide potable water for these villages. In those villages (Raisangadh and Rajpur) where the PLPs are the primary source of potable water, there have also been difficulties in management. In Coastal

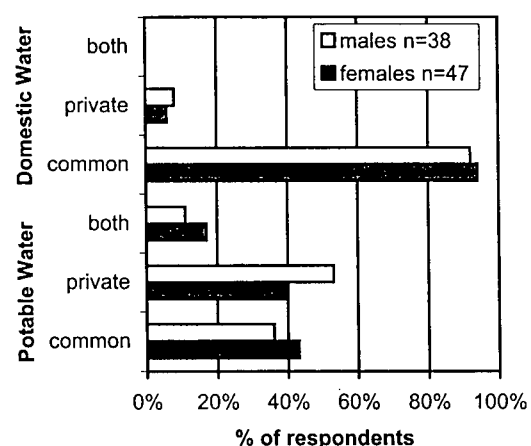
Bhavnagar, although women preferred common resources slightly more than private potable water resources, at 43% and 40% respectively, the difference is insignificant. Men, however, preferred private resources rather than common potable water resources at 53% and 36% respectively. However, the difference between the women's preferences in the two study areas may be reflective of the greater severity of the potable water problem in Coastal Ahmedabad leading to conflicts and a desire for private sources.

Figure 5.3 Gender Preferences for Common vs. Private Water Resources

A/ Coastal Ahmedabad



B/ Coastal Bhavnagar



Source: *Utthan and Mahiti* Gender & WRM Household-Level Questionnaire (1998)

My observations lead me to believe that there are four main reasons for a high preference for private potable water sources in both study areas. First, there is a desire for increased sanitary conditions. Second, villagers want an increase in water security at the household level and perhaps an increase in the socio-economic status of the household. Third, in times of severe water scarcity, verbal and physical fights over acquiring adequate

quantities from common sources plague the study villages. Finally, at the time of the study, villagers were aware of recent funding grants by the Gujarat Water Supply and Sewage Board (GWSSB) for both study areas to expand into further development of RWCTs.

5.6 Impacts of Water Resources Initiatives and Gender Implications

In order to get a closer look at the impact of the Plastic Lined Ponds (PLPs) and Roof Water Collection Tanks (RWCTs) initiatives and to analyse the impact on the surveyed households, we must first look at the utilisation of these new sources and their success (or lack thereof) in increasing potable water availability and access. In this section, I will present the gender-related implications of energy and time expended in the labour of fetching water. For purposes of discussion, I will draw on both the quantitative data from the household survey and qualitative data from focus group discussions and participatory observation in select study villages. It is important to note that the quantitative data was collected on a household level; therefore, the minimums and maximums are reflective of the fact that individual household size ranged from 4 to 15 individuals. It was not possible to convert and present the data on a per capita basis (i.e. in the table on litres of water) because the numbers of individuals per household varied due to seasonal rural to urban migration.

In the Bhal, the cultural gender division of labour for fetching water can be seen at any water source, as girl children and women of all ages fetch *hails* of water balancing them back to the houses on their heads. Due to this role and responsibility, women and girl children are adversely affected in numerous ways such as health (long distances and heavy loads) and lack of time to pursue other activities (basic education, income generation and socialising). Below I will examine the impact of the water resource initiatives. This can be

measured by change in a) seasonal availability of and access to water sources in terms of litres fetched, and b) utilisation of sources in terms of distance to primary sources and the time⁵ required to fetch water. Moreover, this can be illustrated by a change in women's labour.

5.6.1 Impact of Plastic Lined Ponds (PLPs)

It is important to note that in the study villages the PLP initiatives have not been successful in supplying adequate potable water. Moreover, all but two are defunct due to salinity. The only two villages which depend on PLPs for their main source of potable water are Raisangadh year round, and Rajpur in the summer months only. Severe monsoon flooding has caused the brick structure of the PLPs to deteriorate over a number of years, exposing the under layer of impermeable plastic and causing it also to deteriorate. If left unrepaired the PLP structure eventually degrades so severely that water becomes saline and the PLP is defunct as a potable water resource for the respective village. The physical breakdown of the PLPs is due to structural problems and the challenges of the harsh environment; however, the state of disrepair also is due to poor village-level management. The reasons for poor management of the PLPs varies from village to village and will be discussed in Chapter 6. Villages which do not use their PLP as the primary source of water are left to cope with the insufficient and brackish water coming from natural, traditional and government sources.

⁵ Often, two women would accompany each other while fetching water. Therefore, the total time only reflects the time taken for that trip, rather than the time taken by each individual women.

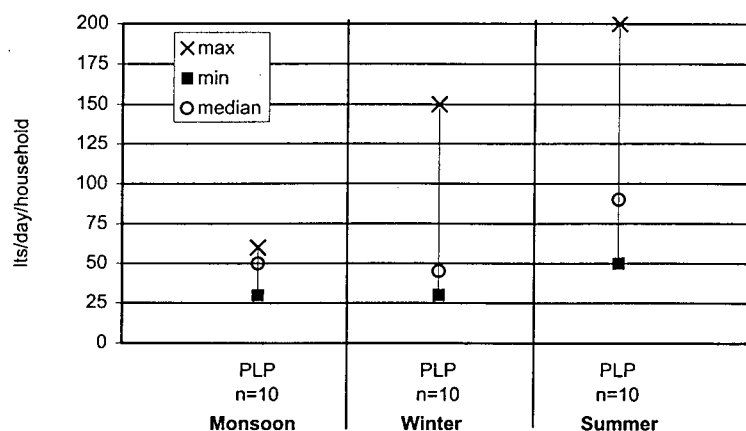
In order to further illustrate the impact of the PLPs, I have selected key villages for comparison. The following bar chart summarises the results of the household surveys in two study villages of Coastal Ahmedabad, Raisangadh and Kama Talav. These villages are comparable because they are similar in size, caste composition and water resources; moreover, both study villages have experienced the same process of community development guided by *Mahiti*. Yet, Raisangadh utilises only the PLP as its primary water source in contrast to Kama Talav, where poor management has caused the PLP to become saline, forcing the villagers to utilise other sources. In the discussion I will also draw on the experiences of other study villages for qualitative information where relevant.

Seasonal Availability and Access

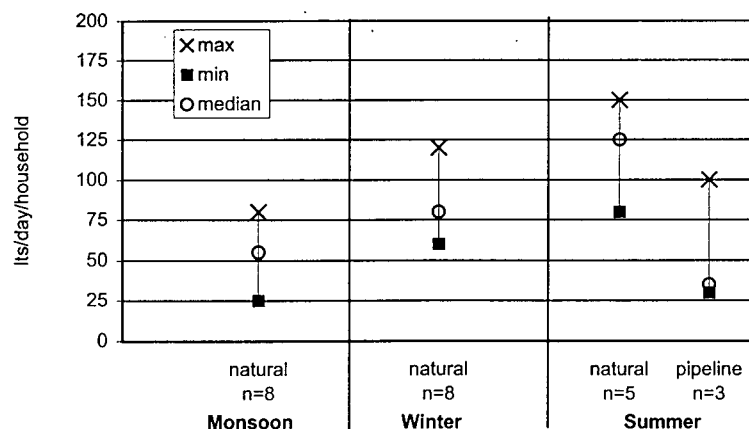
Figure 5.4 A and B illustrates the direct benefits experienced by Raisangadh in terms of consistency of water availability and access to litres of water fetched per day in the three seasons. There is little difference between the amount of water fetched from the PLP (Raisangadh) and natural sources (Kama Talav) in the selected study villages in the three seasons. In each village the large differences reflected in the maximum and minimum litres of water fetched per household per day in a single season is reflective of a) individual surveyed household size ranging from 5 to 13 individuals and b) the use of the primary water resource for animals by households who own livestock. In both villages the median increase in litres of water fetched in the summer months is reflective of the increased human and animal water consumption due to temperatures averaging 50°C.

Figure 5.4 Litres of Potable Water Fetched/ Day/ Household in Select Study Villages of Coastal Ahmedabad

A) Raisangadh



B) Kama Talav



Source: *Utthan and Mahiti Gender & WRM Household-Level Questionnaire (1998)*

Figure 5.4 A illustrates that surveyed villagers in Raisangadh viewed the PLP as a seasonably reliable source in terms of availability and access. The PLP provided sufficient water to be utilised as a primary source of potable water in all seasons, especially in the summer. The notable change in litres of water fetched seasonally can be attributed to not

only the rise in temperature and therefore an necessary increase in consumption but also, the shift away from concurrent use of other sources in the monsoon (not reported as primary source), to solely relying on the PLP in winter and summer. Moreover, in the summer season the PLP is the only source of potable water available for both human and livestock consumption.

Figure 5.4 B illustrates how villagers in Kama Talav are not are able to adequately meet their quantity needs with a single reliable primary water source. In the winter and summer seasons, as many other natural sources dry up and increase in salinity, respondents reported a shift to government sources for potable water because of the insufficient availability and poor quality water provided by natural sources (ponds and *virdas*). This trend can be seen throughout all the villages where the PLPs were defunct.

Distance and Time

In both the illustrated study villages the distance *to* the PLP (in Raisangadh) and natural sources (in Kama Talav) ranged from 0.5 to 1.0 km. from the surveyed households. It is important to note that this measurement is reflective of a *single trip* to the water source. However, in order to meet the litres required for an average household's demand, up to 7 trips would be required if a woman carried 35 litres (3 *hails*) per trip, the maximum any one person can manage.

In the monsoon and winter seasons there is no significant difference in the distance travelled to the primary water sources as they are both within the village itself. However, in the summer season the distance to the government source (pipeline) reported to be utilised by

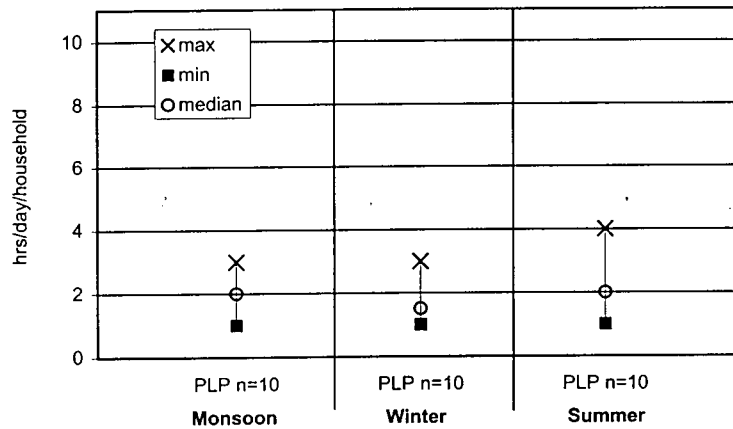
some surveyed households in Kama Talav ranged 6 to 10 km. In these distant sources, it was reported that only one or two trips would be made per day. In these circumstances it was reported that men would also pitch in their labour by taking ox carts or bicycles; however, women would have to walk.

The variability in time taken to fetch the water in all seasons reflects the total litres of water fetched and the number and age of women fetching water for individual households. During the monsoon and winter seasons there is no significant difference in time required to fetch water in the respective villages. However, women reported difficulties in walking to fetch water during the monsoon, due to flooding (0.5 m to 1m), caused by the inability of the sun baked soil of the summer to absorb the heavy monsoon rains.

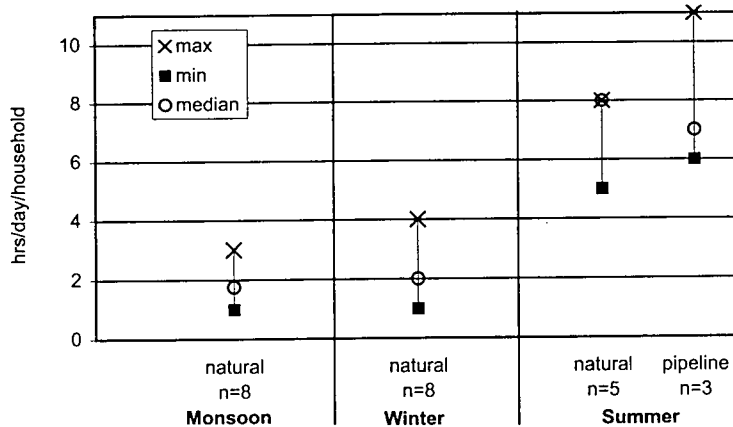
Below, Figure 5.5 A reflects the consistency in time required by fetching water from the PLP. This is important in that it creates a sense of predictability of the women's work load and a sense of a security that other activities (e.g. waged labour) can be pursued with consistency.

Figure 5.5 Time Taken (hrs/day) to Fetch Potable Water in Select Study Villages of Coastal Ahmedabad

A) Raisangadh



B) Kama Talav



Source: *Utthan and Mahiti Gender & WRM Household-Level Questionnaire (1998)*

The marked increase in time required in Kama Talav during the summer season (as seen in Figure 5.5 B) illustrates that this same security is not present. In Kama Talav the time required to fetch water from the natural pond increases in the summer because *virdas* must be dug and water must accumulate. The high number of hours required by use of

government sources in the summer by respondents in Kama Talav was due to the distances travelled to the source. Although more time is required to access these distance sources, they supplied a much higher quality of water.

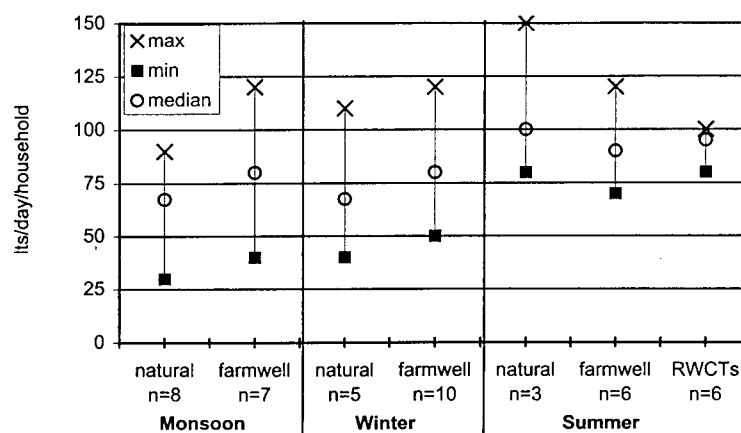
5.6.2 Impacts of Roof Water Collection Tanks (RWCTs)

Due to the fact that RWCTs are a source for an individual household, in order to illustrate their impact at a village level it is only necessary to look within one specific village to adequately illustrate the benefits. Thus, for purposes of discussion I will give examples from the village of Surka of Coastal Bhavnagar. In the total of 15 household survey interviews conducted in Surka, 6 households had RWCTs. It is important to note that there were only these 6 RWCTs in the entire village of 142 households.

Seasonal Availability and Access

Below Figure 5.6 illustrates the varying litres of water fetched per day in the three seasons, as reported by the households surveyed in Surka. In the summer there is an increase of the total amount of water fetched due to increase in consumption during the hot summer and the drying up of secondary sources. Although, the litres/household of water fetched from farm wells was consistent, the number of households which have access to private farm wells increased as water decreases in common unrestricted access village sources. Since Surka is a single caste village there were no caste restrictions on the natural common access wells versus the private restricted access farm wells. It appeared, however, that access to farm wells was based on kinship and poor families tended to have less access privileges across seasons.

**Figure 5.6 Litres of Potable Water Fetched per Day per Household
in Surka Village of Coastal Bhavnagar**



Source: *Utthan and Mahiti Gender & WRM Household-Level Questionnaire (1998)*

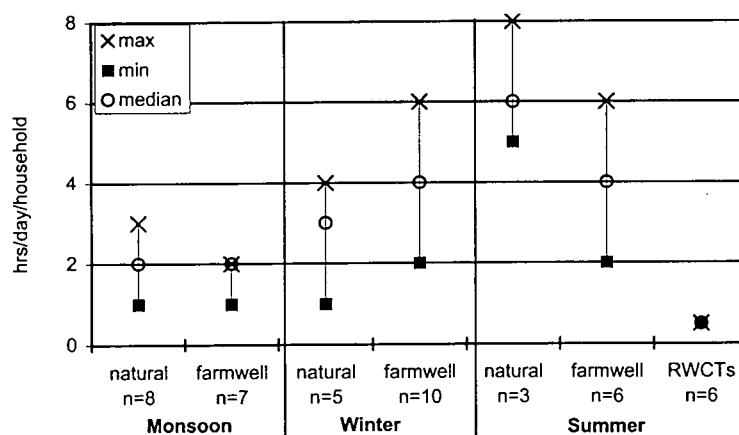
At the end of the monsoon, there was no longer fresh rain water to revitalise the shallow common wells, thus by mid-winter (December or January) they became insufficient and brackish. Although the median litres/household of water fetched from natural remained the same in monsoon and winter, and increased in the summer, the number of households using natural sources declined. While not illustrated by the RWCT sampled household data, in the focus group discussions women reported the number of individual households accessing farm wells in times of water scarcity (summer) increased. By the end of winter and during the entire summer season, only a few individuals (the poor households) in Surka were left using natural sources as their primary source of potable water. Those households with RWCTs use them only in the summer. Although the number of households with RWCTs in the villages was small, they did provide all potable water needs in the summer months for those individual households. All villages in Coastal Bhavnagar are supposed to receive

government-delivered tanker water in the summer months. However, it was reported by villagers to be so unreliable that they did not bother to mention it as a source.

Distance and Time

In Surka as in many of study villages in Coastal Bhavnagar, the distance women walk to fetch water increases, as common sources in the village become brackish. Women seek water from the higher quality sources available (usually private farm wells) to keep their families and themselves healthy. In Surka, the common access water sources such as shallow wells and *viridas*, ranged from 0.5 to 1.0 km. from the surveyed households.

Figure 5.7 Time Taken (hrs/day) to Fetch Potable Water in Surka Village of Coastal Bhavnagar



Source: *Utthan and Mahiti Gender & WRM Household-Level Questionnaire (1998)*

Due the undulating terrain in Coastal Bhavnagar the women reported that they had to walk carefully so that they would not slip in the mud during the heavy monsoon rains. From mid-winter until the end of summer, women reported digging *viridas* in dry ponds and river beds, resulted in increased the time taken to fetch water. The time required for fetching water

also increased due to the time waiting in queues for fetching water at common and farm wells. Here, women repeatedly reported increasing stress causing social conflicts because of the fear of insufficient water and the increasing amount of fetching time required from January to July. Clearly, the households with RWCTs benefit not only by the reported low hours (0.5 hrs/day) required for fetching water but also, by the security in availability of potable water and the decrease in social conflict.

5.7 Field Notes Speak Louder Than Statistics

The following is an excerpt from my field notes which clearly illustrates some of the gender implications and the severity of the water scarcity problem in the study villages of the Bhal (see Figure 5.8).

January 15, 1998

Bhutashwar Village, Coastal Bhavnagar

Arriving at Gauriben's house we were told that she would be back soon as she was at the well fetching water. Upon her return she invited us to go to the well because there was a queue and she had left her hails there waiting. Knowing my interest in village women and water from previous visits, on the walk she proceeded to tell us (and act out for the benefit of my limited Gujarati) a fight between 2 women at the well the day before. "...yelling, hitting, ripping clothes...one sister hit the other and she fell to the ground." My mind flooded with questions that I wasn't able to ask in full Gujarati so I asked simply "Why?" Upon arrival at the well the answer became clear. I saw something that I could not believe -- just one month earlier the well had been full to nearly the top -- now it was empty with only a small puddle of water at the bottom.

I counted 15 women and children and about 50 hails waiting in a queue around the common well in the dry river bed, waiting for water. They told me that water was infiltrating at 5 litres every 20 minutes. With 35 litres being the minimum requirement for the average household, each woman would have to wait for over 2 hours to get sufficient water...not including the time required for all the women in front of her in the queue.

While we were there one young woman and a middle age women had a verbal confrontation when one of them attempted to jump the queue. The conflict was cut short when one male farmer yelled from a nearby field that he had some water in his farm well. However, only 3 women and 2 girls picked up their hails and quickly ran off, leaving the other women waiting for water.

FIGURE 5.8

VILLAGE WELL, BHUTASHWAR, COASTAL BHAVNAGAR



Village women waiting around village well for water (mid winter), Bhutashwar, Coastal Bhavnagar, Gujarat.



Looking into the same well, note the small puddle of water (infiltrating at 5 litres every 20 minutes).

6.0 Gender and Water Resources Management: Women's Participation in Gender Equitable Decision-Making

Although in much of India and throughout the Bhal study area, cultural gender roles designate women as fetchers of water, there is no historical evidence that women have played any role in the maintenance or management of the water sources. Traditionally, in the Bhal, *panchayats* [village councils] maintained and managed water resources and it appears that women had no input or responsibility. Today, in the absence of outside pressures such as from NGOs, gender roles still typically do not allow women any responsibility for maintaining or managing specific sources, such as annual de-silting or cleaning of ponds.

In much of India, including the state of Gujarat, the current trend is to have local NGOs, such as *Utthan* and *Mahiti*, act as implementing agencies for government or foreign-funded development projects. The pressures of foreign donors, global development policies and local grassroots NGO initiatives have forced current government WRM policy to acknowledge the virtues of decentralisation. There is now a focus on small local resource development emphasising local people's participation and village-level institutional management. More recently, acknowledging that in the absence of outside pressures village women generally do not have an effective presence in decision-making bodies or institutions, these same pressures now demand that WRM decentralisation policies pay close attention to the gender implications, arguing that gender inequalities might be further entrenched. In effect, decentralisation might further marginalise women's access to water resources and control if there is not equitable gender representation. Moreover, these pressures advocate that an integrated gender component within WRM will increase local participation,

particularly of village women, where previously they had no roles or responsibilities. This can be achieved by integrating women into village-level institutions such as *Pani Samitis* (water committees) which govern the resources.

In a similar vein, it is important to note that the government reservation system requiring women to have 33% representation in all levels of government including village-level bodies (see discussion in 3.3.2) is only enforced on formally elected bodies, thus institutions such as *Pani Samitis* have no formal responsibility to include local women in their membership nor to solicit their opinions. Village womens' representation, membership and involvement in *Pani Samitis* are only being introduced to some of the villages because of pressures from global development agendas and local NGO mandates. If these pressures did not actively encourage the integration of women into decision-making institutions, the cultural norms and expectations would continue to exclude women.

Recently, throughout many rural villages in Gujarat working with NGOs, including the Bhal study villages, there has been an obvious rise in female involvement and membership in village-level *Pani Samitis*. However, as will be demonstrated in this chapter, the goals and aims espoused by the gender and WRM literature are not always met successfully. Judging by my experiences and observations in the Bhal study villages, the literature simply does not accurately depict or address village realities. Here I will argue that in order to achieve redistribution of power along gender lines, simple integration of womens' participation in different project phases, including the decision-making institutions, although needed and beneficial, is in itself inadequate. Due to the gender barriers created by cultural

norms present in the study villages, womens' strategic needs were better articulated and reflected in womens' groups where they could act as a common unit with common interests.

6.1 Gender Roles in the Management of Potable Water Sources

One village woman reported that, "the *Pani Samiti* takes no responsibility and no one does anything, but when summer comes and we are all running around all tired, we will be regretting it." A major reason for the decline of village-level natural traditional water sources is the breakdown of earlier community management institutions. Traditionally, village water sources were built by and maintained by the village communities; however, many of these village institutions have broken down over the past 50 years. People are more eager to get piped water than to clean up local sources. As one villager said: "What was once everybody's, has become nobody's business."

In order to examine current roles and responsibilities of women and men in the study villages, I divided the sources into two categories: 1) *natural or traditional sources*, including village wells, ponds and farm wells; and 2) *modern sources*, such as government pipelines and tanks, Plastic Lined Ponds (PLPs) and Roof Water Collection Tanks (RWCTs).

6.1.1 Management of Natural/Traditional Sources

Coastal Ahmedabad

All respondents of the household survey conducted in the study villages of Coastal Ahmedabad reported that in their village the natural pond(s) used for potable water were managed by a set of rules regarding use and conduct. Only the village of Raisangadh reported extending rules of use to the natural pond used for domestic purposes. In Panchi, Rajpur,

Kama Talav and Gogla these rules prohibited the use of the natural ponds for anything other than drinking and cooking. Moreover, the respondents explained that the rules of conduct near the pond prohibited entry of cattle, washing clothes or vessels, bathing and going to the toilet near the pond.

It was reported in the household surveys that these rules were set either by the *panchayat* or the village *Pani Samiti*, and were generally followed voluntarily. Some villages, such as Panchi, had in place a fine system of Rs. 500¹ for violation of pond rules. Another village reported that a violation resulted in a fine of 1 kg of wheat. However, in these two cases, women said this was rarely enforced by the leaders of the village. In Gogala, the only village of Coastal Ahmedabad which did not work with *Mahiti*, villagers reported that they employed a watchman whose job it was to enforce pond rules and regulations. One woman in Gogala reported that each household contributed Rs. 51 per year to cover the cost of his wages and other general maintenance which some male village leaders undertake. However, the other women interviewed were not aware of their household contribution to this fund.

Only in Raisangadh and Rajpur did women report that it was the women themselves who set the rules. In Raisangadh, although the pond was exclusively used for domestic purposes, women said that they themselves set rules. During focus group discussions with the *Mahila Mandals* of Raisangadh and Rajpur, it was reported that once the pond became dry, a group of

¹ Rs. 500 would be equivalent to approximately \$35 (Cdn), which on average, is more than one month's income for a household.

women from the *Mahila Mandal* would clean up the bottom by removing all the debris, and also that “we leave the plants as they act as a cover to prevent evaporation.” No other activities such as digging the pond deeper were mentioned in the other village surveys or focus group discussions. It was, however, observed that ponds were being de-silted. This was evident in a few study villages where mounds of dirt lay around some of the natural ponds. Upon inquiry villagers said that it was part of a government employment scheme which provided funds for make-work projects in the summer when no labour opportunities were otherwise available. These jobs were generally filled by men of the village; however, some women also participated.

As there were few management and maintenance activities happening within the study villages, it can be concluded that it was neither a male nor a female responsibility to manage the natural water sources, but rather that of the village leaders in official positions. When women were asked in informal group discussions what role they played, they stated that they contributed to the upkeep of the natural ponds as village members, by obeying the rules of use and conduct and by not wasting water. Only 36% of the women mentioned this in the household survey, while 26% mentioned that natural pond maintenance ought to be the responsibility of male village leaders.

Coastal Bhavnagar

The household survey conducted in Coastal Bhavnagar revealed that there was very little being done in the study villages to maintain or manage natural potable water sources. Only 29% of those surveyed reported any activity, and of these, 85% reported that it was done by male village members or male leaders of the *panchayat* or *Pani Samiti*. Only one female

member of the *Pani Samiti* in Surka stated that “females de-silt the well collectively.” One of the males on the same committee stated that “people clean the wells collectively.” Due to the overwhelmingly low number of reports of maintenance and management activities, I informally probed into *why* there was no maintenance. Over 90% of the respondents had no comment or said they did not know. A few individuals (both male and female) made comments such as, “the majority of the time, no attention is paid,” “nobody is interested” and “if the *Sarpanch* [village head] instructs people to clean the well, it will be done, otherwise no one can spare the time.” One woman from a poor household said it was because “everybody thinks of themselves first.”

6.1.2 Management of Modern Sources

All of the study villages in Coastal Ahmedabad reported in the household survey that there was no maintenance of the pipeline or government tanks (into which the pipeline emptied). In all the villages, the pipeline, whether a common standpost or household tap, did not function or was extremely erratic. Women often said “There is no water to manage in empty pipelines.” In the study villages of Coastal Bhavnagar, although there were no long distance pipelines, similar responses came from women regarding the large cement government tanks which sat empty near the village centres. These tanks acted as storage tanks for short pipeline systems which connected several villages within a certain radius of a government-drilled well which tapped into a deep aquifer otherwise inaccessible to the villages. However, these schemes failed because the aquifer was rapidly depleted due to over-exploitation and thus the village storage tanks sat empty. In the Coastal Bhavnagar study villages RWCTs (Roof Water Collection Tanks) were still new. Those households with RWCTs reported that they were either not sure what maintenance activities they required or

mentioned cleaning the gutters and painting the tank with calcium carbonate (a natural antiseptic) before the monsoon.

Plastic Lined Ponds (PLPs)

Out of all the study villages of Coastal Ahmedabad that had PLPs, only Raisangadh and Rajpur (where PLPs were the primary source of potable water) reported current management initiatives or maintenance activities with regard to the PLP. The household questionnaire and informal focus group discussions revealed that the PLPs were maintained and managed by the women of the *Mahila Mandals*. Prior to the women's involvement via the *Mahila Mandal*, it was reported that misuse was leading to pollution of the water. The original purpose of the *Mahila Mandals* (which exist in all study villages in both Coastal Ahmedabad and Coastal Bhavnagar) was to act as a savings and loan group and place for discussion and dissemination of information regarding community development initiatives, including WRM initiatives. For further discussion on the role of *Mahila Mandals* see 6.2.1.

As will be discussed throughout this chapter, only in three villages in Coastal Ahmedabad did these women's groups also take on activities of maintenance and management responsibilities of the potable water resources in their respective villages. In the villages of Raisangadh and Rajpur the women were actively managing the PLP, however, for reasons to be discussed, the *Mahila Mandal* in Kama Talav were unsuccessful in taking control of the PLP due to insurmountable intra-village social conflict.

In Raisangadh and Rajpur, the women reported similar WRM activities and initiatives of the *Mahila Mandal*. Rules of conduct and use prohibited all uses of PLP other than for drinking and cooking. These rules were set by the women themselves and enforced through common understanding and peer pressure, as opposed to the initiatives mentioned above in other villages, in which rules of conduct (which were *not* set by women) imposed fines, but were not enforced. More recently, Raisangadh women started to go door to door to collect Rs.5 from each household so that they could buy chlorine powder to ensure the cleanliness of the water in the PLP. It was reported in Rajpur that through the women's initiative and village co-operation a general fund is collected for preservation of the PLP and for fuelling and maintenance of a pump. Moreover, it was reported in both villages that "women's participation is good, yet some people in the village still do not accept women's management." In general, however, men reported that "women are actively involved in the maintenance of the PLP...they don't allow pollution or overuse of the water and even stop other villagers from coming to use it." For further discussion on women's experience and impact on the village WRM see 6.6 and 6.7, respectively.

Until three years ago, a group of women from Kama Talav also attempted to create a management system for their village PLP. However, social conflicts created by two murders divided the village and the women were never able to take control of the PLP. In the household questionnaire the one female respondent who was a former member of the *Pani Samiti* (which was inactive at the time of the survey) reported that "women had a role in the construction of the PLP but didn't have a say in the decision-making process." Other women said that although "there is no current co-operation by women in the management of the PLP,

previously, it was the women who co-operatively maintained it.” Others said that “women always came forward to maintain the PLP but villagers were not ready to co-operate with us.” Here it can be seen that, even though women were included starting from the construction phase of the project, were integrated as members into the *Pani Samiti* and worked co-operatively as a group, the village would not accept their leadership. Although increasing social conflicts and divisions eventually led to non-co-operation among the women themselves, they could not break the gender barriers which held them back from taking control and becoming leaders of the village.

As discussed earlier, the degree of maintenance and success of management of both traditional and modern sources varied from village to village and according to the level of co-operation or cohesiveness within the village. Within each village this was dependent on both caste or sub-caste relations, the level of women’s participation and the degree of male and village acceptance of the women’s initiatives.

6.2 Women’s Participation in WRM Decision-Making

In both Coastal Ahmedabad and Coastal Bhavnagar, the respective NGOs have actively encouraged equitable gender participation in the WRM initiatives. Both NGOs encourage women, especially those who are heads of households and those who hold leadership potential, to become involved in all project phases, especially institutions such as *Pani Samitis* that manage the village-level water resources. Moreover, the respective NGOs have guided the *Mahila Mandals* to disseminate information about village-level development initiatives and encourage women to gather and share their own ideas with the *Pani Samitis* (as

members and non-members of the *Pani Samiti* itself) and in some cases to act collectively to better the village water resource.

6.2.1 Role of Mahila Mandals in WRM

In the Bhal study villages, *Utthan* and *Mahiti* wanted to emphasise commonalities of the water shortage and the urgency of WRM by establishing *Pani Samitis*. However, before such initiatives could be facilitated an exchange of information and trust had to be built between the villagers and the respective NGO. Understanding this, the NGOs first entered the study villages by establishing *Mahila Mandals* or Women's Saving Groups. Here, *Mahila Mandals* act as both an entry point for the NGO into the community and as a platform from which women can engage in economic and political activity, previously discouraged by men. Thus a dialogue was begun with the communities about the water problem via the *Mahila Mandals*.

An important component of the integrated gender approach is to increase women's knowledge and understanding of WRM issues. One of the main means of educating the village women is through participation in the *Mahila Mandal*. It is here where women have an opportunity to build trust amongst themselves while also gaining knowledge of village development initiatives. Moreover, it creates a safe place for women to vocalise their preferences and opinions in the decision-making process. Not all women are able, nor are all women interested to participate in *Pani Samitis*. Furthermore, it is not necessary or desirable for all villagers to participate in the formal decision-making institutions such as *Pani Samitis* as long as there are appropriate means for them, especially the women, to be informed and have an input into the process.

6.3 Gender Attitudes

An important aspect of gender equity which must be analysed in any community development process is women's and men's attitudes regarding women's roles and responsibilities. This is especially relevant in WRM initiatives such as the projects illustrated in this study because they actively seek to encourage a change in cultural gender norms by seeking to equitably balance women and men's participation in decision-making and village leadership.

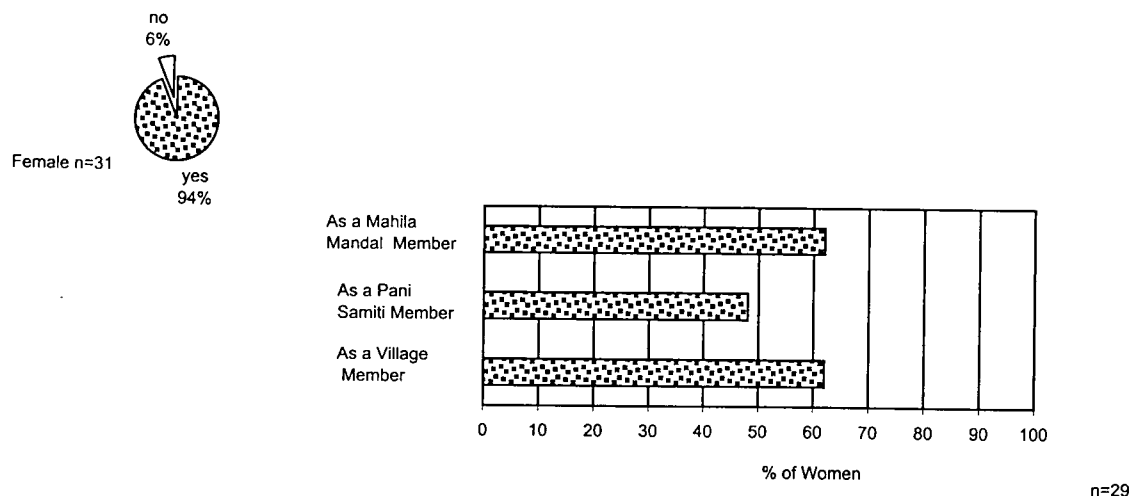
It is to be expected that it takes time to change attitudes regarding women's participation in the management of resources and involvement in the decision-making institutions. Thus, the two study areas illustrate two different WRM initiatives at different stages. They illustrate the potential strengths and weaknesses in the different approaches of common versus private property WRM. Although it is too early to clearly see the impact of the integrated gender component in WRM initiatives in Coastal Bhavnagar, the initial stages highlight an interesting trend.

6.3.1 Coastal Ahmedabad

Below, Figure 6.1 (pie chart) overwhelmingly reveals that 94% of the women respondents in the household survey of Coastal Ahmedabad believe that "Yes, women should have a role in solving the drinking water problem." The corresponding bar chart further breaks down the responses regarding *how* they thought women ought to participate. Of this group women reported at 62% that village women ought to participate as "village members." Women defined "participation as a village member" as taking guidance from village males (i.e. members of the *panchayat* and *Pani Samiti*), contributing their labour in maintaining

sources (i.e. during summer digging deeper the natural pond), and co-operating in the rules of use at any given source. These female respondents believed that women's roles ought to be limited and did *not* believe women had a role in the water management decision-making process. Some of these women reported that "Women should be made to participate" while other thought only those interested ought to come out. Although only 6% of the female respondents in Coastal Ahmedabad reported that they believe women do *not* have a role to play in solving the drinking water problem, it was for reasons such as "due to cultural restrictions women can not participate" and that "women lack the time to participate." It is important to note that although the *Rajput* caste women *could not* participate, both women and men in *Rajput* households saw a role for "other caste women to participate as village members only."

Figure 6.1 Woman's Responses (Coastal Ahmedabad)
Do Women Have a Role in Solving the Drinking Water Problem?
If so, in What Capacity?

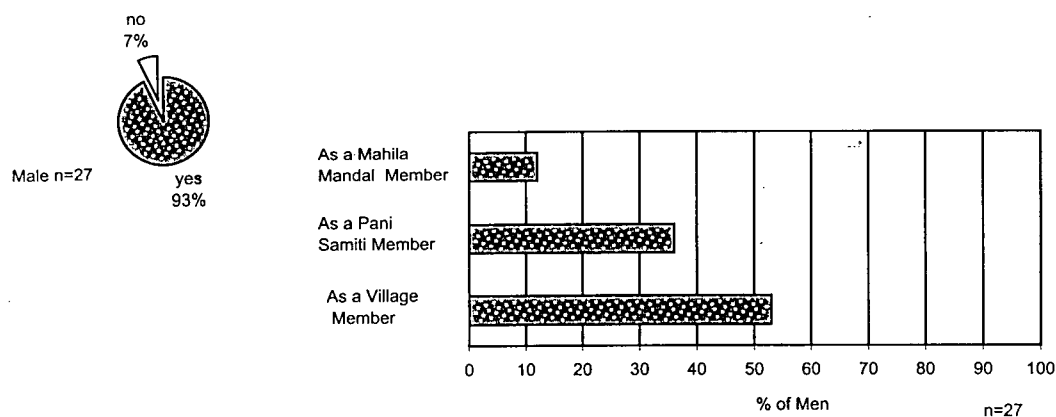


Source: *Utthan* and *Mahiti* Gender & WRM Household-Level Questionnaire (1998)

On the other hand, 48% of the female respondents thought women ought to take a direct role in the decision-making process of solving the potable water shortage through “membership in the *Pani Samiti*, taking leadership and making decisions.” Interestingly enough, of this 48%, half were *not* members of the *Pani Samiti* in their village. Moreover, recognising their own privileges and the cultural family constraints of other village women, less than half of the current female *Pani Samiti* members said that women ought to be members of the *Pani Samiti*.

Sixty two percent of the women thought that village women could alternatively participate in decision-making through the established *Mahila Mandals*, believing that women could speak more freely within an all women environment, stating that “Women can help the *Pani Samiti* by participating in the *Mahila Mandal*.” Women expanded by saying “females leaders must take decisions and lead plans of action” and “...as members of the *Mahila Mahdal* or as members of *Pani Samiti*, females should be given the right to take decisions.” Moreover, women emphasised that women can take “membership in the *Mahila Mandal* where water issues can be discussed and where women can unite and work for regular access to water” believing that “through a women’s union we can bring awareness and travel outside to study new methods [of WRM].”

Figure 6.2 Men's Responses (Coastal Ahmedabad)
Do Women Have a Role in Solving the Drinking Water Problem?
If so, in What Capacity?



Source: *Utthan and Mahiti Gender & WRM Household-Level Questionnaire (1998)*

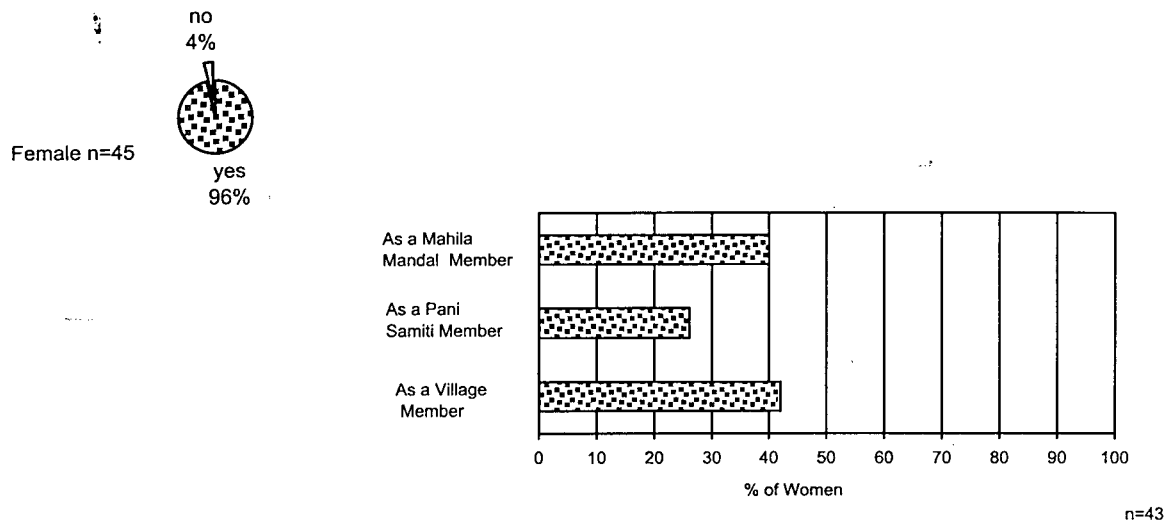
Important male gender attitudes are revealed when we use the same breakdown to analyse male responses. Although 7% of men in Coastal Ahmedabad thought women did *not* have a role in solving the drinking water problem, arguing that “females don’t know much about WRM,” an overwhelming 93% of the men in Coastal Ahmedabad reported that women *do* have a role in solving the drinking water problem. The majority (53%) think that women should behave as “village members by taking guidance from male leaders.” In this group, men reported that “women do not have the knowledge to participate in the decision-making process.” However, 36% of these men thought women should participate in decision-making, stating that “women ought to take a role in the decision-making process through membership in the *Pani Samiti*.” Although this seems encouraging, as discussed below in 6.2, male attitudes created many barriers to women’s participation in WRM decision-making. However, across the study villages in Coastal Ahmedabad only 12% of the male respondents supported

women's involvement in WRM activities via the *Mahila Mandal*. In Raisangadh and Rajpur it is clear that male attitudes have indeed changed. In these two villages the highly active women's participation in the *Pani Samiti* and the *Mahila Mandal* is reflective of male support. Here, 80% of the male respondents thought that women ought to take a decision-making role in village level WRM.

6.3.2 Coastal Bhavnagar

As presented below in Figure 6.3 representing responses of women surveyed in study villages of Coastal Bhavnagar, it was found that overwhelmingly 96% thought that village women *have* a role to play in solving the drinking water problem. The majority of this group expressed their responsibility by stating that, "Yes, farm work is men's work and house work and fetching water are women's work, therefore, water is women's problem, not men's." Although only 4% of the female respondents thought women did *not* have a role their given reasons were that "women have to observe social limitations so they can not participate" and one poor woman said "only those with shoes go to village meetings" or "what would we do by going there? Males are more desirable."

Figure 6.3 Women's Responses (Coastal Bhavnagar)
Do Women Have a Role in Solving the Drinking Water Problem?
If so, in What Capacity?

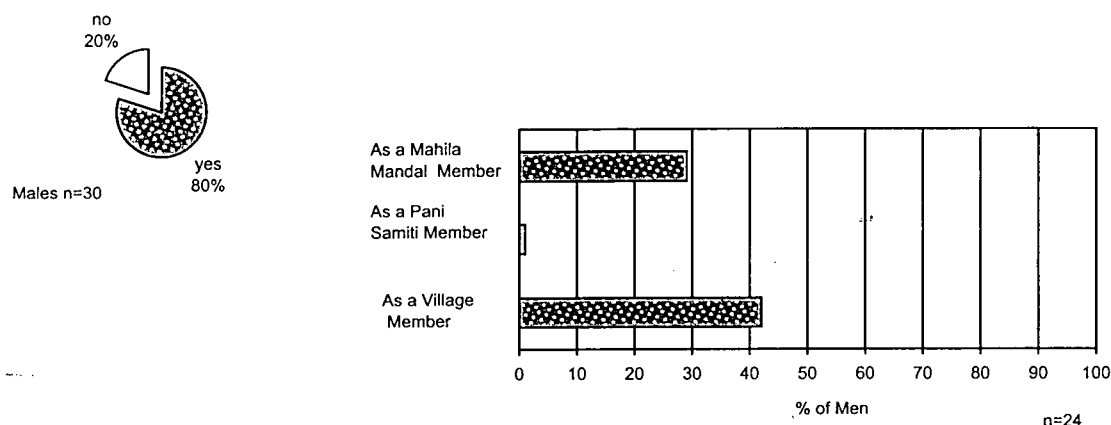


Source: *Utthan and Mahiti* Gender & WRM Household-Level Questionnaire (1998)

Using the same breakdown of the 'yes' responses it was found that 42% of the female respondents thought women should participate as "village members" or "where appropriate our opinion should be sought out by the male leaders." A substantial 26% of the women who thought women ought to participate believed women should participate as members of the *Pani Samiti*. One of the female leaders in Surka stated that "Women's role is to fetch water so we must always take responsibility to be on the Pani Samiti and be vocal." Even elder women were in support stating "I am aged now so I do not have much interest but other women in my house ought to participate."

It is important to note that in Coastal Bhavnagar although 40% of the women reported that they ought to participate in WRM via the *Mahila Mandals*, they did *not* speak of women taking leadership or decision-making roles. Rather, they talked about the “need for women to unite,” also stating that “it [water] is our [women’s] problem, thus the elder men should give us rights to also take part in planning.” This is reflective of the length of time the NGO has been working in the study villages and the role that the *Mahila Mandal* undertook in the planning of the RWCTs. In the first phases of the initiative the Gujarat Water Supply and Sewage Board (GWSSB) refused to fund the project, thus *Utthan* turned to the *Mahila Mandals* to seek loans from the Women’s World Bank. The women obtained the loan thus allowing the project to proceed. At the time of the study it was too early to see the impact the loans had on individual women. More importantly, however, the women needed to have a common action point, such as a common water resource, in order to bring them effectively together to participate in decision-making.

Figure 6.4 Men's Responses (Coastal Bhavnagar)
Do Women Have a Role in Solving the Drinking Water Problem?
If so, in What Capacity?



Source: *Utthan and Mahiti* Gender & WRM Household-Level Questionnaire (1998)

In contrast, 20% of the men reported that they thought women did *not* have a role in solving the drinking water problem in Coastal Bhavnagar. These men reported that “women simply have no role in solving the drinking water problem as they do not have the knowledge or the know how,” “women can’t manage water resources” and “it’s the male leaders’ responsibility.” However, an overwhelming 80% of the male respondents reported that women do have a role to play. One respondent said “If women participate then they can help solve the problem.” The men interviewed recognised the benefit of women’s participation but also acknowledged the various barriers: “if women participate properly, then planning will be suitable to them.”

When they were further asked what role women ought to undertake, the men’s gender biases were revealed. Only 1% of the male respondents thought that women ought to take roles in the decision-making process via membership in the *Pani Samiti*, stating that, “women

should be involved but they don't know much" and "they should be asked for the sake of it." Recognising the requirements of the government and other funding agencies and women's access to outside loans, one man stated, "It is good to include women's opinions to have better standing with the government." However, on a more positive note male responses focused around women's participation via the *Mahila Mandal*, with 29% recognising that finding an appropriate "space for women's participation would help women participate effectively" and that "if women get together they can form collectives." This reflected, perhaps the role the women of the *Mahila Mandal* played in securing loans to implement the RWCTs. Men also reported that women ought to participate as "village members" (42%), believing that women have a limited role in solving the water problem.

6.3.3 Gender Attitudes Forming Barriers

An important point to draw from the above results and discussion throughout 6.3 is there are differences in opinion between men and women as to *where* and *how* women ought to participate in WRM in the respective study villages. Although a strong majority of both men and women believe women *do* have a role to play in solving the village drinking water problem, it is often limited to participation as a "village member," following rules of conduct and use, and where directed by male village leaders or *Pani Samitis*, participation in maintenance activities. Because women and men in both study areas did *not* often see a similar role for women in solving the drinking water problem, gender barriers are created preventing women from effectively contributing particularly in the *Pani Samitis*. More women than men see a role for women's activities and input into or full participation in WRM decision-making via the *Mahila Mandal*, rather than taking a direct role in the *Pani Samiti* decision-making process.

It also became clear that women were well aware of how they could best be heard and have input in the *Pani Samiti*, that being in though *Mahila Mandal*. Women of both study areas, however more so in Coastal Ahmedabad, described the potential of the women's groups as more than just a savings and loan group, but rather a place where they could learn the issues and discuss ideas adding to the final decision. The female leaders who were more comfortable in speaking out would pass the collective ideas on to the *Pani Samiti*. As will be discussed in 6.7, a few key *Mahila Mandals* went beyond this and took it upon themselves to act collectively in the maintenance and management of the water resources of their respective villages.

Therefore, an integrated gender component in WRM which aims at increasing women's participation on *Pani Samitis* will issue many challenges for both women and men alike. Lessons can be learned by analysing the expressed gender attitudes of women and men as to where women's activities, initiatives and participation within WRM initiatives might be most accepted and therefore more effective. It was also revealed that there is a strong potential that can be drawn from womens' concurrently or alternatively participating in WRM activities and decision-making processes via the *Mahila Mandal*.

6.4 Gender Barriers to Participation in *Pani Samitis*

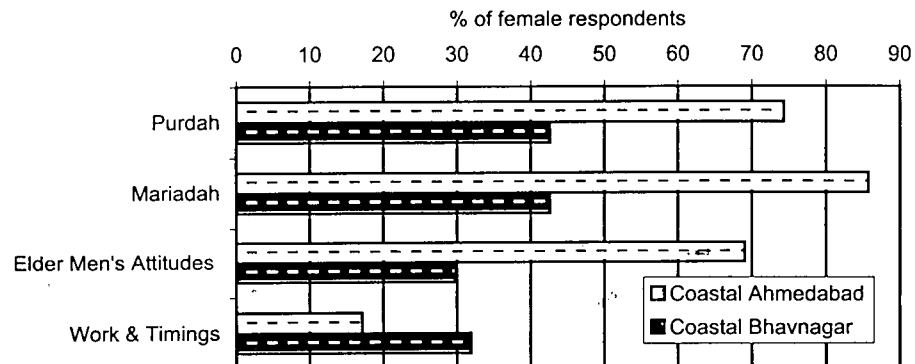
As revealed within the study villages of the Bhal, cultural attitudes regarding gender roles and responsibilities play an important role in both encouraging and discouraging village women's participation in formal WRM activities and decision-making. Recognising this when attempting to increase their effective participation in *Pani Samitis* is vital as it demonstrates the need to understand the impact gender barriers have on the village women.

Furthermore, gender roles and responsibilities in the decision-making process of WRM depend on women's access to the process. It is therefore necessary that a gender analysis within WRM initiatives acknowledge and address gender barriers to participation in decision-making institutions as viewed by the village women themselves.

The following quantitative data is a compilation of female respondents in study villages within both study areas of the household survey looking at reported gender barriers impeding their participation in the formal *Pani Samiti* within their own respective villages. For purposes of analysis and discussion I also have drawn on focus group discussions with the various study village *Mahila Mandals* and women of *Pani Samitis*, including the intra-village *Bhal Samiti*.

Below, Figure 6.5 illustrates the top reported barriers to participation in the *Pani Samitis* which over 30% of the women reported in either study area. Almost all the female respondents in both Coastal Ahmedabad and Coastal Bhavnagar reported *pardah* [the cultural custom requiring women to cover their face] as a barrier at 74% and 43%, respectively. Moreover, *mariadah* [the culturally expected "shyness" restricting women from vocalising their opinions] was reported at 86% and 40% respectively as the main barriers to their own and/or other women's formal participation as members of the *Pani Samiti*. They reported that "we cannot speak face to face," "we cannot speak as we wish" and "we [women] cannot go outside [to other towns or strange villages] together and we have to follow some social limits." Moreover, "women are not encouraged to speak in meetings." Some women simply reported that they "have a fear of society."

Figure 6.5 **Top Reported Gender Barriers to
Woman's Participation in *Pani Samitis***



Source: *Utthan and Mahiti Gender & WRM Household-Level Questionnaire (1998)*

Attitudes of elder men and, to a lesser degree, husbands were also reported as barriers by the women at 69% and 30% in Coastal Ahmedabad and Coastal Bhavnagar respectively. For example, it was cited by women that “elder males and husbands imposed cultural restrictions on the women, often forbidding or strongly discouraging us from attending” and/or participating in *Pani Samiti* meetings. The women reported that “we cannot go without the permission of [elder male] household members,” or “if I ask to attend I quarrel with my husband” or “he threatens physical abuse.” Women of the Rajput caste are forbidden by their caste customs to participate in nearly all village activities. Furthermore, women of *Pani Samitis* reported that they “cannot freely speak against elderly men and village people will not listen,” “in the presence of [male] elders, we have to restrain ourselves and keep our reputation.” It was also repeatedly reported that “men laugh at us.” An old *Sarpanch* [village leader] in one village in Coastal Ahmedabad said he himself encourages women’s participation but “if women are part of the *Pani Samiti* one will listen to them...men will just say ‘Who are you to speak?’”

Women also noted that they could not participate because they had “too much work” and complained about the poor timings of the meetings as “at night I must do household chores, because in day I do paid labour,” “the house work will suffer” and “I must stay home with the children.” On the other hand, although most men did acknowledge and report that women must follow *purdah* and *mariadah*, others said that “there are no barriers, women should be leaders but they take no initiative.”

Many of the differences in the two study areas can be attributed to the cultural differences of the caste makeup and the influence of the dominant caste of the area. Coastal Ahmedabad study villages are mainly comprised of *Talapada Koli* and Coastal Bhavnagar study villages are *Koli Patel* dominated. Although these castes are both OBCs and have similar gender cultural rules, Coastal Ahmedabad study villages are under greater influence culturally by *Rajputs* who have conservative rules governing the women. Thus in Coastal Ahmedabad, women reported greater pressure of elder men’s attitudes and to perform *purdah*. Even though the *Pani Samitis* are generally composed of the majority *Talapada Kolis* the females still reported these cultural barriers.

6.5 Women’s Experiences in *Pani Samitis*

Despite the reported barriers, women are members of village-level *Pani Samitis* in both study areas and inter-village *Bhal Samitis* due to *Mahiti’s* and *Utthan’s* presence and mandate of gender equity and women’s empowerment. One woman in Raisangadh reported that “although *purdah* is still there, previously we were not allowed to go out, speak or anything, but now we are able.” It is important to note that not all villages had female

members. In those villages where women were members and attended the meetings regularly their presence, input and participation varied by village. Due to cultural norms women sat in a group separate from the men, with either their backs to the meeting or facing the meeting with their faces covered in *pardah*. In most of the village *Pani Samitis* I attended, female presence was virtually ignored unless NGO field staff drew them into the conversation. However, apart from times when the women were drawn into the group by the male leaders or when they protested what was being said, it appeared that women more often than not, were passive members. In the absence of external pressure women did not vocalise their concerns. At the same time, however, I also recognise that I might not have been privy to informal networking which women used to get their opinion heard and included. The culturally expected shyness, or *maridah*, however, did appear to affect the women's active vocalisation during the meeting.

During one inter-village *Bhal Samiti* meeting I observed women's silence even when there was equal gender representation. Women with nervous laughter refused even to stand up and introduce themselves to the group. Eventually, with much prompting one woman while still sitting with her back to the group gave her name and what village she was from. Throughout the meeting women listened and generally did not speak. The notable exception to this, underlying the importance of women's presence, occurred when a few women disagreed with what was being said and spoke out. In these instances women's comments were indeed integrated into the final decision-making.

Further dispelling the romantic view which much of the ecofeminist literature emphasises, some of the women, like some of the men, were there for their own benefit rather than the community which they were to represent. For example, the discussion in one of the *Bhal Samiti* meetings I attended was about which of the villages and households ought to receive the newly sanctioned RWCTs and there was loud debate regarding who was in most need. Much to my surprise one of the women spoke up and said “why are we talking about giving RWCTs to people who are not even here?” In response, one of the elder male leaders said “we must remember, we are here working for the good of all villagers, from all villages, not just those represented here today.”

The majority of the women, however, were much more co-operative and positive. After a focus group discussion with the women of the *Bhal Samiti*, I asked *why* they were members and one woman said “if one women comes, she is coming for the whole village.” When asked about barriers and what others thought of them participating one said that “it is difficult in *purdah*, but if I do not others will say ‘oh what shame she brings!’” Another woman said that “People talk bad about me for travelling with outside men [NGO staff] on scooters and that I go to the city. But I know that I am doing good work for my village.” Indeed, cultural norms do impede women’s freedom to voice their opinions in the *Pani Samiti*; however, some women have made progress insofar as they are active members.

Despite the barriers, women’s presence and participation in decision-making is important for three main reasons. First, they have the right to be equally informed about community development and pass the knowledge to other village women. Second, women

have a right to an equitable input in the decision-making process by bringing their own and other women's opinions to the meeting. Third, they need to have a sense of ownership and control over the resources and the governing of them.

6.6 Women's Impact in village-level WRM

In this section I will mainly focus on the study villages of Coastal Ahmedabad as the women in these villages have had 5-10 years experience in the *Pani Samitis* and *Mahila Mandals*. Although women of Coastal Bhavnagar have contributed to WRM initiatives, it is too early to see the full impact of women's participation in these study villages. In general, women here had many of the same experiences as in Coastal Ahmedabad. One of the more vocal women in Surka told me "there have been difficulties to speak in the meetings because men laugh at us. Men take the final decision, and we accept it." In Coastal Ahmedabad, only in two of the six study villages (Raisangadh and Rajpur) did women report positive experiences or say that women's participation has had a positive impact on the villages. Here, female *Pani Samiti* and *Bhal Samiti* members reported mixed experiences varying from village to village.

Women's Views

In the villages, such as Panchi and Kama Talav, women reported that they had bad experiences and thought that women's participation had had no effect. In these villages they reported that "when we try to speak our minds it leads to confrontations and quarrels" and "people do not understand and are not helpful to females who want to become involved." In Kama Talav women reported that they feel that "we are not listened to and despite speaking out about conserving water and our steps to control water, males continue to waste water." Moreover, the women emphasised that "we have not had a good experience, as they [men] do

not listen to women's opinions" and that "village people are not ready to accept women's ideas and suggestions."

In all the study villages of Coastal Ahmedabad, except Raisangadh and Rajpur, it was reported by *Mahila Mandal* members and non-members alike that they had not succeeded in exercising a stronger role in water resource management and other community development because social conflicts and caste biases within the village penetrated the women's group. These conflicts and biases caused a social divide among the women themselves. Dalit women reported that "I would like to be involved in the *Mahila Mandal* and *Pani Samiti* but as a *Dalit* I don't get invited. I have gone in the past but no one makes space for me to sit or speak." Although the Kama Talav *Mahila Mandal* did make attempts to take on maintenance activities, the social conflicts related to two murders divided the village and the women themselves. One women said to me that "the *Mahila Mandal* has split in half and are fighting. Some of the female *Pani Samiti* members are in each *Mahila Mandal* so now when we have questions and ideas for the *Pani Samiti* we don't communicate and share the same message."

In contrast, the female respondents of Raisangadh and Rajpur reported to have had a much more positive experience stating that, "Earlier we did not have inner confidence, but now there is an awakening. Women can talk at village meetings and even outside to government officials and other outsiders." Many women of Raisangadh emphasised that through "exposure to the outside world [other villages, towns and cities] we found inner courage to lead our village to progress." In Rajpur the women on the *Pani Samiti* reported in the household survey that they had a good experience and "were glad they joined the *Pani*

Samiti because the whole village was benefiting from their work by helping to solve water problem.” They said that, “initially experiences were not encouraging and ponds were not properly looked after but as we [the women of the *Mahila Mandal*] have learned how to speak out we have become more assertive.” Later some of these women came to me and said in confidence “my experience has not been good as there are power conflicts and womens’ participation is not equal in decision-making.”

6.7 Women Taking Control

Although most of the literature focuses on making formal institutions right for women, it is beginning to acknowledge the potential of women’s informal participation in WRM. As Meinzen-Dick and Zwarteveen (1998) in their observations of decentralised irrigation initiatives in South Asia, point out, in spite of not formally being members of village decision-making institutions, “women may play other roles in organisation, or in carrying out collective action” (Meinzen-Dick and Zwarteveen, 1998: 340-341). They go on to say that,

[t]here exists a few documented examples of such non-formal ways of female participation...[However,] although highly anecdotal, these examples of management related tasks and roles of women suggest that non-formal and less recognised ways of participation in water user’s organisations may prove to be promising area of research. It may provide important entry points for identifying realistic ways to make water users’ organisations more gender equitable, while also shedding new light on the determinants of the performance of organisations by uncovering management practices and decisions that have hitherto gone unnoticed. (Meinzen-Dick and Zwarteveen, 1998:341).

The question of women’s appropriate and effective involvement raises the question of whether participation, whether formal or informal, brings women influence in decision-making regarding WRM. The following anecdote illustrates how female actors might have a decisive influence regarding strategies and outcomes. Here, gender capacity building and

community mobilisation went beyond token acts to become effective participation and empowerment, clearly reaching far beyond the creation of a drinking water source. Moreover, it emphasises that the process of women's empowerment and participation is just not an entry point for women to the political, social and economic action within their community, but can also aid the success of the project by enhancing the process of community mobilisation.

The potential of women's collective action can be best illustrated by the demonstrated strength, intelligence and actions of the women of the *Mahila Mandal* in the village of Raisangadh. The following is an anecdote recorded by *Mahiti* in a report called *Glimpses of Women Empowerment in Bhal Region - Exercising Right by the Community* (1996):

Raisangadh (a village in the Bhal, Coastal Ahmedabad District) is comprised of 700-800 families of *Koli Patel* (the main caste of the area). This village had been active with *Mahiti* since the late 1980's and were recipients of the plastic lined ponds development initiatives. The incident that follows took place in 1996 well after the monsoon and when water in the surrounding area annually became scarce. However due to good rains that year Raisangadh's plastic lined and natural pond were still full. But the case was not so in many neighbouring villages like in Cher village, which was only 6 km away. Cher was comprised of only *Rajput* caste, had not been active with *Mahiti*, and had not taken any initiative to combat the water shortage within the village. Cher did not have sufficient drinking water so they thought of taking water from the lower caste Raisangadh plastic lined village pond. Originally, the high caste village of Cher requested the lower caste village of Raisangadh for some water. Raisangadh responded to their neighbours' need and asked them only to take a little. Unsatisfied and angered by the lower caste village response, some of the *Rajputs* wielded their political strength at the district government and managed to get an official letter to the fact that they could take water from the Raisangadh Plastic Lined Pond (PLP). With this they brought a diesel pump and fed it to the broken pipeline of the GWSSB, which led to their village. The villagers of Raisangadh were angered and confronted the villagers of Cher at the waste of the precious water as the pipeline was broken and most of the water would not even reach their village. However, they refused to stop pumping the water. The women of Raisangadh's worry grew as they saw the water level dropping in the pond. A group of women, who belonged to the savings group initiated by *Mahiti*, approached *Mahiti* and the inter-village *Pani Samiti*

(which was established by *Mahiti* at the time of building the PLPs) for information and support. With the correct information of what they could do to stop the pumping of the water the women from the savings group and other local women (about 60 in total) took to demonstrating in front of the district government office. As a result, the district officer issued a letter demanding the Cher village stop pumping the water and remove the pump immediately. All in all, this resulted in teaching a lesson to the powerful *Rajput* community and proved the power of the women, while elevating their confidence.

As one can see from this anecdote, the process of women's empowerment can bring women together with a common bond and a common vision. Effective participation towards WRM does not have to be limited to formal participation in village bodies. Here it was demonstrated through non-formal participation in the village level *Pani Samiti*, via the *Mahila Mandal*, which created space for women to gain access to, and become part of, the decision-making process at a variety of levels.

Here, "[e]mpowerment means that people are able to *organise* and *influence change* on the basis of their *access* to knowledge, to political processes and to financial, social, and natural resources" (Emphasis in original. Slocum et. al., 1995:4). The Gender, Environment and Development (GED) paradigm does recognise the intricacies and complications of development in that it acknowledges that gender implications simply means including women's views while not ignoring men's views. Moreover, it recognises the need to empower women through effective participation in political action. The GED approach reveals drinking water as not only a resource but as political-economic power. It recognises that environmental degradation and maldevelopment projects further marginalise poor rural women and other groups which depend on the natural environment for subsistence. GED encourages active, effective participation of local women and other oppressed groups by

valuing their knowledge and insights depicting the local situation and ideas for sound community development (Jackson, 1998). As seen above, women's empowerment can become an essential part of maintaining a sustainable drinking water resource.

Village Women's and Men's Interpretations

Nearly two years after the above anecdote I visited Raisangadh and conducted the household survey as well as focus group discussions with the *Mahila Mandal* and other villagers, the ramifications were still present. Upon reflection, however, women also reported that "before women's experience was not good and people did not listen, but now because of *Mahila Mandal*, village members [women and men] say the women are doing good work." Stating that "before the PLP the community did not consider women's participation and opinions and wasted a lot of water, but now people listen." Yet despite women's success, one woman acknowledged that her experience "as a member of the *Pani Samiti* is now satisfactory, but still some men are not accepting women speaking out at the meetings." A majority of the women noted that, "previously we had no experience in participating in village level decision making. Now, we have maintained the pond and have sufficient water and now the villagers help the women."

The proud female members of the *Pani Samiti* and *Mahila Mandal* eagerly told me of how "previously males used to laugh at women and would criticise them, but when females saved the pond water from the other village's thieves the men realised the women were doing good work." They emphasised that "we have had a good experience on the *Pani Samiti*, because we saved the water and the village people now listen and co-operate with us."

Moreover, they emphasised that because of women's participation not only has the "problem of water been solved, unity has come among women."

6.7.1 Need for Women's Common Action

This common bond demonstrated by the *Mahila Mandal* in Raisangadh is difficult to achieve not only within the study villages of the Bhal but also within many villages across India. This is mainly due to the fact that there are many 'cultural walls' between castes, classes and men and women themselves. The above incident clearly reflects the valuable contributions of *Utthan's* and *Mahiti's* approach to WRM and other community development initiatives. It also emphasises the potential held within the emerging development theory of Gender Environment and Development (GED) and its espoused tool of an integrated gender component within WRM initiatives not only in theory but more importantly in practice. However, remembering the dual goals of increasing access to and control of water resources via gender equitable participation, it appears to be insufficient. As the majority of the study villages demonstrate, simply integrating women into the village-level *Pani Samiti* was insufficient for increasing water security and sharing control between women and men. As demonstrated by the women of Raisangadh, however, it is indeed a valuable step which may lead to greater water security and women's empowerment. Furthermore, the key to the integrated gender approach in Raisangadh, as opposed to many of the other study villages, is women's collective action to take control of a common resource for the benefit of the entire community.

As one can see from this anecdote the process of women's empowerment can bring women together with a common bond and a common vision. This common bond, however, is

problematic in many villages in India due to the fact that there are many 'cultural walls' between castes. The above incident is not only reflective of *Utthan* and *Mahiti's* approach but also clearly emphasises the value of GED in theory and practice. Here, building on the integrated gender approach, the NGOs were able to: "a) exchange information, b) build a scientific attitude among the communities, c) create space for communities' active involvement from a gender perspective, d) identify alternatives on a sustainable basis, and e) build on the collective strength of communities, to not only manage and augment their resources, but also to undertake efforts to influence policy level changes" (Barot 1998:474).

As one can see from this anecdote and the reported impact it had on changing gender attitudes it becomes clear that although *Mahiti's* mandate encouraging an integrated gender component was present, it was, by itself insufficient. Simply encouraging women's membership in the *Pani Samiti* by itself did not allow for women's and men's strategic interests to be articulated or reflected. In all the villages where this was being applied, there was no marked increase in gender equitable participation in the maintenance of the water sources and decision-making process itself.

Although in Raisangadh it did indeed aid in the process, it was the women's collective action of seizing control of the PLP which led to women's empowerment and effective participation. Prior to the women's collective action, women's and men's strategic interests were not being fully articulated and reflected in the *Pani Samiti*. It was the women's collective action that brought about the needed change in gender attitudes necessary to create and maintain a redistribution of power along gender lines. This had a positive impact on the

community because it allowed women to become not only effective participants but more importantly, effective leaders in village-level water resource management.

7.0 Conclusion

When searching for viable ecological, technical and social solutions to the potable water scarcity problem in the Bhal and much of India it is vital that issues of availability, access, and control of village-level water sources be examined in application of a gender analysis. This is especially important in arid saline regions such as the Bhal, Gujarat, because the impacts of the rapidly degrading potable water resources have gender implications. Moreover, the possible solutions pursued through WRM initiatives, such as the ones illustrated here, also have gender implications which cannot be ignored. After all, it is these village women who bear the load of *hails* which increasingly contain little water.

The international development discourse which forms the agendas for current policies at the global and national levels in developing countries has espoused a policy shift towards decentralisation and community participation. More recently, gender analysis has been co-opted by the mainstream development agencies. However, as suggested here and as Mehta (1997) argues, it has brought “a rather naive assumption that just because a project is small [and requires local people’s participation], it is bound to be successful and egalitarian. The principles of democracy, equity and participation are espoused, forgetting that existing power and social relations within the [village] community are based on different axioms” (Mehta, 1997:80). Furthermore, my findings are supported by Agarwal’s (1994) and Mehta’s (1997) argument stating that, “local politics, local hierarchies and the frailties of human behaviour are often ignored. Hence the 'community' tends to be glorified and institutions are viewed

ahistorically. They are not seen as a dynamic interplay between formal and informal networks, embedded in communities' social and power relations" (Mehta, 1997:81).

Often, even micro-level watershed schemes run by NGOs or the state fail because of the neglected importance of in-depth insight into the social dynamics of the village. Therefore, it is important that any kind of water resources intervention accommodate the existing social and power relations. This does not mean that the intervention must accept those dynamics, such as gender inequities; rather, it must seek to challenge and transform the power inequities which are entrenched in and perpetuating the problems.

Utthan and *Mahiti* worked hard at emphasising the commonalties of the water shortages in the Bhal villages and the need for village-level management by establishing *Mahila Mandals* and *Pani Samitis*. Although the integrated gender component within WRM was applied in all study villages it was not always possible to bring the people together as the cultural or political rifts in the village were too deep. Furthermore, the women that sat on the *Pani Samitis* as members generally reported that they had a bad experience. In both study areas when women's WRM activities were limited to *Pani Samiti* membership, both participants and non-participants reported that women's participation made little or no impact.

The mainstream Gender, Environment and Development (GED) literature, suggests that an increase in local participation, particularly of village women who previously had no official roles or responsibilities, can be achieved by integrating women into village-level

institutions which govern the water resources. The Bhal case study demonstrates the various levels of appropriateness of the GED approach in the field. As illustrated, my experience in the Bhal revealed that an integrated gender component within WRM initiatives, although beneficial, did not always achieve its dual goal of gender equitable participation and increased access to and control over water resources by women. Simply integrating women into village-level WRM institutions was insufficient for increasing water security and redistributing power along gender lines. In addition to the GED approach, for successful gender integrated WRM, this case study demonstrates the concurrent need for: strong NGO involvement; a focus on common property water resources; a cohesive women's group (e.g. *Mahila Mandal*) and; common WRM action taken by the women's group themselves.

In a few study villages, women did succeed in taking a leadership role in WRM. As illustrated, some key *Mahila Mandal* groups extended their activities into water resource maintenance and management activities. Although *Mahila Mandals* were originally established as a women's savings group to build trust amongst the women, to strengthen them as a group and increase their access to financial resources, some groups were more united than others. The capacity building within these groups emphasised dissemination of knowledge and possible alternatives for community development, particularly in issues such as WRM which women expressed as a top priority. As illustrated in Raisangadh, access to and control of local water resources increased, which gave rise to greater drinking water security, primarily resulted from village women's collective action in the management of common water resources. Due to the women's collective action, not only was the drinking water problem virtually solved, but their actions created gender-equitable redistribution of

responsibilities and control, allowing a new focus for further community development. In these key villages women were able to gain control of the political situation, which was creating deeper impoverishment. Furthermore, as emphasised by GED, natural resource management was both an entry point for the NGO into the community, and a platform from which the women could engage in economic and political activity which was previously discouraged by men.

As for the gender aspect of equity, development theorists and practitioners cannot ask or expect local rural women to take full responsibility for the natural resource management of drinking water resources. Indeed, women are already overburdened and generally do not usually hold the necessary political power or economic capacity to single-handedly manage such resources. As a community resource, water must be 'owned' and managed by all to prevent conflicts amongst stakeholders who also must develop a shared understanding and a set of common goals. As suggested here, women are excellent sources of knowledge and have great insight into the interconnections present in natural resource management and development issues. It is essential that women are involved at all stages, from determining strategies, sources, implementation and monitoring, to evaluation and especially management. There is no doubt that women will contribute to and deepen the roots of sustainability. However, the water problem is a community problem and all must contribute to its resolution.

Within the context of a wider international framework it is only by challenging power structures at the global, national, and village levels that true social change can become a meaningful part of the whole notion of sustainability. Furthermore, through securing

women's effective participation and empowerment in the process of community mobilisation, important insights can be provided into the conceptualisation of sustainability. Many things can be learned from experiences at the grassroots and these should shape the building of the larger theories so that they can be more appropriate.

The advancement of women and the achievement of equity between women and men are a matter of human rights and a condition for social justice. They should not be seen in isolation as simply a women's issue. They are the only way to strive for and build sustainable and just societies. Empowerment of women and equity between women and men are prerequisites for achieving political, social, economic, cultural and environmental security among all peoples. It is here where the importance of women's equitable participation and empowerment becomes clear within the framework of WRM. What this means is that, collectively women have much to contribute, even though they cannot be expected to take full responsibility.

In any community development initiative such as the WRM projects illustrated here, it must be understood that a constant readjustment based on on-going information exchange is needed under complex, changing and highly uncertain conditions. Local women as well as men must be involved in consciousness-raising and knitting together a "shared understanding of problems and a vision for the future that leads to commitment and ownership by the community" (Slocum et. al., 1995:5). Moreover, through collective actions such as those demonstrated by the women of Raisangadh, women can become active agents of change and able to induce a redistribution of power along gender lines. This in turn allows for both

women's and men's strategic interests to be articulated and reflected as a united village striving for better water resource management.

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ACRONYMS

CWRM	Community Water Resources Management
GAD	Gender And Development
GED	Gender, Environment and Development
PRA	Participatory Rural Appraisal
WAD	Women And Development
WID	Women In Development
WRM	Water Resources Management

GLOSSARY

<i>Bhal Samiti</i>	intra-village natural resources and development committee (composed of about 40 villagers representing villages working with <i>Mahiti</i>), established and facilitated by <i>Mahiti</i> .
<i>hail</i>	a set of containers to fetch, carry (balanced on women's heads) and store water in rural India, ordinarily in a series of three (large, medium, small) constructed out of stainless steel or earthen clay. One large <i>hail</i> holds 15 litres, a series of three <i>hails</i> holds 25-30 litres of water. The weight of the series of three <i>hails</i> is 35-40 kg depending on the material of which it is constructed. The height of the three balanced on top of each other is approximately 1 metre.
<i>Mahila Mandal</i>	<i>Woman's Savings Group</i> , in the respective study villages, established and facilitated by <i>Utthan</i> or <i>Mahiti</i> .
<i>Mahiti</i>	" <i>Information</i> ." NGO working in the Coastal Ahmedabad study area.
<i>mardidha</i>	the cultural expectation for women to be 'shy'; not to speak out in the presence of elder men.
<i>panchayat</i>	village council
<i>pani</i>	water
<i>Pani Samiti</i>	<i>Water Committee</i> . A non-elected village-level committee established to govern and maintain village water sources established by <i>Utthan</i> or <i>Mahiti</i> in the study villages.
<i>pardha</i>	the cultural expectation for a woman to cover her face with her sari.
<i>sarpanch</i>	elected village-level leader of elected council
<i>Utthan</i>	" <i>Uplift</i> ." NGO working in the Coastal Bhavnagar study area.
<i>virda</i>	in dry riverbeds and lakes, hand dug scooped holes made in sand for drinking water purposes.

Appendix #1

Utthan and Mahiti Gender & Water Resources Management Household-Level Questionnaire

Village Name: _____ Date: _____ Surveyor: _____

1. Principal Information:

Name: _____ Age: _____ Caste: _____

People in House/Family: _____ Economic Position: _____

Owner of a Private Drinking Water Resource (DWR): Yes / No Type of DWR: _____

Participation with Utthan/Mahiti Activities: Yes / No

Owner / User of RWCT (by Utthan/Mahiti): Yes / No

State names of Household/Family member of the water committee?:

2. Availability and Use of Drinking and Domestic Water: Present Consumption

2.1 Top four problems of your village:

	1	2	3	4
Caste Feuds				
Scarcity of Drinking Water				
Scarcity of Domestic Water				
Quality of Drinking Water				
Scarcity of Irrigation Water				
Scarcity of Fuel (wood & dung)				
Scarcity of Fodder				
Scarcity of Paid Labour				
Migration				
Other				

2.2 Daily Drinking and Domestic Water in your Household

	Open Well	Farm Well	Step Well	Hand Dug Well	Pond	Tanker	PLP/RWCT	Pipeline	Hand Pump
Availability									
Common									
Private									
Gov't									
Distance (km)									
Time of Day									
Time Taken (hr.)									
Quantity (lt.)									
Quality									
Availability									
Common									
Private									
Gov't									
Distance (km)									
Time of Day									
Time Taken (hr.)									
Quantity (lt.)									
Quality									
Availability									
Common									
Private									
Gov't									
Distance (km)									
Time of Day									
Time Taken (hr.)									
Quantity (lt.)									
Quality									

2.3 Quantity of Available Water

Uses	Monsoon			Winter			Summer		
	Avail	Need	Qual	Avail	Need	Qual	Avail	Need	Qual
Drinking									
Cooking									
Bathing									
Vessels									
Animals									
Business									
Other									

1- Sweet 2-Tasteless 3- Brackish 4- Salty 5-Impure

2.5 Who fetches water in your household?

Female or Male: _____ Female or Male: _____ Female or Male: _____

Age: _____ Age: _____ Age: _____

Position in Family: _____ Position in Family: _____ Position in Family: _____

2.6 How much time do women spend daily on collection of water?

	Monsoon			Winter			Summer		
	km	# of times	hrs/d	km	# of times	hrs/d	km	# of times	hrs/d
Drinking Water									
Domestic Water									

2.7 When water demands so much of women's time, how does it affect their lives?

2.8 The water that is available, is it sufficient? yes / no

If no, how do you arrange for meeting your needs?

	Drinking Water			Domestic Water		
	Monsoon	Winter	Summer	Monsoon	Winter	Summer
Common Source						
Private Source						

2.9 How do you cope in times of severe water shortages?

- using less water (if so, how & where?): _____
- tanker (price?): _____
- other sources (type & distance?): _____
- fighting (with whom?): _____
- different ways (explain): _____

2.10 Is there any caste conflict or alignment during times of water scarcity?

no / yes / not sure

2.11 Does the village witness any fights during water scarcity? yes / no

2.12 If yes, why?

- water timings: _____
- volume: _____
- quality: _____
- caste discrimination: _____
- long line ups: _____

3. The Process of Participation in Water Usage and Resources Management:

3.1 How does the village manage the traditional and modern drinking water sources?

3.2 If no management is taking place what is the reason?

3.3 What is the present system of water distribution and how could it be improved?

3.4 In your opinion is it necessary to have one or more source for drinking and domestic water?

	Drinking Water	Domestic Water
Women		
Men		

3.5 In your opinion is it necessary to have private and/or common sources for drinking and domestic water?

	Drinking Water	Domestic Water
Women		
Men		

3.6 In your opinion is it necessary for you to have individual household or a common source for drinking and domestic water?

	Drinking Water	Domestic Water
Women		
Men		

3.7 Has there been any drinking water resource planning at the village level? yes / no
If yes, have you or and other members of your household been involved and in what capacity?

Women: _____

Men: _____

3.8 How would you like to be involved in the future?

Women: _____

Men: _____

3.8 Due to women's role in fetching water do you feel that women should be involved in tackling the drinking water resource problems?

	Yes	No
Women		
Men		

3.9 If yes, in what capacity?

Women: _____

Men: _____

3.10 If no, why not?

Women: _____

Men: _____

3.11 What are the barriers to women's participation in the water committee?

3.12 What has been your / other women's experience in the water committee?

3.13 What has been women's impact after women's participation and how does the village perceive women now ?

4. Alternative Water Resources in your Village

4.1 What suggestions do you have to solve the drinking water problem?

Women: _____

Men: _____

4.2 If you had the choice for a new water resource (PLP,RWCT, pipeline, etc.) what would be your priority?

Women: _____

Men: _____

4.3 In the present situation how do you suggest improving your sources?

Women: _____

Men: _____

4.4 What benefits do the RWC / PLP provide?

	Direct Benefits	Indirect Benefits
Village Level		
Household Level		

4.5 With time saved due to RWC / PLP how do you think you will spend your time?

4.6 Are you going to use the water only in times of water scarcity?

4.7 Will you share the water? At what cost?

4.8 What do you think of the Ghogha Pipe Line / Ingoli Pipe Line?

5. Relationship with Utthan / Mahiti

5.1 What do you know about Utthan / Mahiti?

5.2 Have you participated in Utthan / Mahiti activities? (which ones?)

5.3 If no, why not?

5.4 If yes, what is your experience?

5.5 How do you think Utthan / Mahiti can better meet its goals of helping to create sustainable water resources for your village?

Appendix 2a

Coastal Ahmedabad Household Sampling

Village	Navagamkarna	Kama Talav	Raisangadh	Panchi	Rajpur	Gogla
# of Household Respondents	3	8	10	5	2 (group interviews)	3
Female/Male Respondents	3/2	8/7	10/7	5/5	9/2	3/3
Age Range	32-50	25-60	32-60	30-60	45-60	32-50
Surveyed Female/Male <i>Pani Samiti</i> Members	1/2	3/0	5/4	0/1	2/1	-no Pani Samiti
# of Female Respondents who Participate in NGO activities	2	4	9	2	6	-at the time of the study did not work with Mahiti
Household/ Caste	1-Bhangi 2-Koli Patel	1-Vaghari 1-Valand 1-Sadhu 4-Koli Patel	1-Valand 1-Sadhu 8-Koli Patel	1-Harijan 1-Raval Jogi 1-Koli Patel 2-Darbar	-Koli Patel	1-Sadu 2-Koli Patel
Household/ Wealth Ranking	2-poor 1-med	5-poor 2-med 0-rich	2-poor 6-med 2-rich	3-poor 1-med 1-rich	4 poor -5 med	1-poor 1-med 1-rich
Range of # Household Members	6-8	4-12	5-25	5-11	9-15	7-12
PLP / RWCT	defunct PLP	defunct PLP	well managed PLP	defunct PLP	well managed PLP	no PLP

Appendix 2b Coastal Bhavnagar Household Sampling

Village	Gori	Bhutaeswar	Kuda	Mumsa	Mithi Virdi	Surka	Neswad
# of Household Respondents	5	2	5	4	11	15	3
Female/Male Respondents	5/5	2/2	5/5	4/3	11/7	15/10	3/3
Age Range	28-45	35-50	20-80	25-52	27-65	30-60	43-70
Surveyed Female/Male <i>Pani Samiti</i> Members	1/3	2/2	1/4	0/3	2/2	5/1	-no water committee
# of Female Respondents who Participate in NGO activities	4	2	4	3	7	7	-not Urthan working village
Household/ Caste	4 -Talapada Koli 1- Maharaj	2-Talapada Koli	1-Bhangi 1-Vankar 1-Valand 3-Talapanda Koli 1-Maharaj	4-Koli Patel	1-Valand 2-Bharwad 3- Talapada Koli 6-Koli Patel	15-Talapada Koli	1-Sadhu 2-Talapada Koli
Household/ Wealth Ranking	3- poor 2-med 0-rich	0 -poor 2- med 0- rich	2-poor 5-med 0-rich	2-poor 2-med	4-poor 7-med 0-rich	5-poor 8-med 2-rich	1-poor 2-med
Range of # Household Members	6-17	4-6	4-22	6-10	5-12	6-16	4-8
RWCTs	3	2	-no RWCTs	2	3	8	-no RWCTs

Appendix 3

Utthan-Mahiti's Community Approach and Goals: Creating Sustainable Drinking Water Resources¹

- The source should be reliable and one over which communities can have control.
- The source should be sustainable.
- The source should be designed on the principle of revitalisation and / or building of the resource rather than withdrawing from the existing resource.
- The resources and systems should be based on the knowledge and strength of communities, along with appropriate scientific inputs both for quality and quantity of water.
- The source should be designed on the basis of the need of the communities, that is, drinking water for communities as well as for cattle, and for washing, bathing, household chores, etc.
- The distribution system should be decided by the communities to ensure equitable distribution of water, incorporating the needs and facilities of various sections, especially women.
- Communities will not only participate in planning but also in design, assessing and delegating responsibilities in the implementation and monitoring management of these systems, which means they are capable of handling any alternative which is affordable.
- The system should be based on the values which were shared by communities, for their common property resource.
- All people in the community, especially women, would be encouraged to be leaders in the process.

¹ Utthan , Dec. 1996d.