



By focusing on water and food security in two different parts of the country, this Highlight attempts to understand some key issues on gender neutrality in group and regional contexts. It explores gender bias and neutrality in the impact of a drought or scarcity with particular focus on intra-household risk sharing. A total of 136 households were surveyed in four villages of Orissa and Gujarat, two tribal and two non tribal. Although women bore the brunt of the impact of a drought through shortfall in food availability and consumption expenditure, people's perception and priority about water scarcity gave predominant space to the impact of crop failure on income loss. A household as a decision making unit tends to use women members for 'labor smoothing' and 'consumption smoothing' but without adequate availability and access to resources, existing intra-household gender relations continue to be heavily biased against women.

Water Policy Research

HIGHLIGHT

Gender Equity, Water and Food Security in Drought Prone Areas

A Case Study of Odisha and Gujarat

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GENDER EQUITY, WATER AND FOOD SECURITY IN DROUGHT PRONE AREAS

A CASE STUDY OF ODISHA AND GUJARAT¹

Research highlight based on a paper with the same title²

INTRODUCTION

Water, livelihoods and food insecurity linkage has re-emerged as one of the major policy issues to address gender equity in water and agriculture. But in an agrarian society like ours, unequal availability and access to resources may result in higher gender inequality. Though promoting livelihood, gender equity and food security in rural and backward areas has been reemphasized but a sizeable portion of the weaker sections, mainly women in agriculture continue to share disproportionate levels of hardships. Of late, there is renewed attempt to incorporate gender issues in water and agriculture development. Access to water and management of resources in agriculture has been seen as an essential condition for food security, gender neutrality and human development in rural and backward areas. However, the policy focus on land and water management has been traditionally the domain of men and upper caste that undermine the poor and women. Many women are actively involved in agriculture and other land and water based activities but they hardly participate in decision making that affects their access and control of these resources. Ramaswamy Iyer (2010) argued that intermittent, unreliable, unsafe, inequitable water use; intractable water conflicts; poorly functioning major, medium and minor irrigation projects; unreliable service delivery; and alarming depletion of aquifers are the major factors contributing to inefficiency in water use and management in India. Role of women can be focused to resolve some of these problems but inadequate understanding of gender in water and agriculture in the perspective of prevailing regional, economic and cultural variations can lead to underestimating issues of gender equity in water (IFAD 2007). The present paper contributes in understanding some of the interrelated issues on water and gender in backward agriculture.

Here some issues relating to water scarcity and food security in drought affected areas that tend to worsen

gender inequality have been highlighted in the context of some drought prone regions in Odisha and Gujarat. The focus is on gender neutrality while discussing household risk, coping with water scarcity, resource management, food security, occupational diversification and other household decision making. Given the wider regional and group specific variations in availability and use of water and other resources our discussion concentrates around different agro climatic zones and land size classes representing different regions and social classes. By focusing on water and food security in two different parts of the country, an effort has been made here to understand some key issues on gender neutrality in group and regional contexts which would add to existing knowledge on development policy approaches.

GENDER IN WATER AND AGRICULTURE: SOME ISSUES

Gender is an integral and inseparable part of rural livelihoods but men and women have different ownership and access to resources and opportunities. Women rarely own land, and their access to productive resources as well as decision making tends to occur through the mediation of men. Since rural women typically confront a narrower range of labor markets than men, their occupational social mobility is sometimes limited to land and water based activities. On the other hand in areas of high agriculture growth, the demand for wage labor is increasing and is a critical source of income for poor women.

It is evident that women's labor plays a fundamental role in agriculture and particularly in irrigated agriculture (FAO 2009). In India over 60 percent of women participate in agricultural production activities but they have little share in decision making in farming and irrigation activities due to lack of ownership and tenure in basic resources like land and water. Increasing food and water scarcity in recent years has reduced employment opportunities in agriculture which can have adverse impact on women who have little or no legal or use rights over land and water. As rainfed land constitutes the main

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²This paper is available on request from p.reghu@cgiar.org

source of livelihood for poor farming households more women are often forced to be overburdened with agriculture and livestock activities during drought period when many male workers migrate out. In this context, availability, distribution and use of land and water can influence poverty, food security and gender equity at regional level. Therefore, aim and impact of gender equity in agriculture have reemerged as development policy objective to enhance risk managing capability of women and poor farming households (ADB 2010).

In India new policy and institutions initiated in recent years to make space for women's inclusion in water sector is well debated. For instance, membership to Water Users Associations (WUAs) is argued for increasing women's access to irrigation and agricultural technology. But overall outcome of these new policy initiatives in water sector is not very encouraging due to flaws in institutional arrangement and policy design. In this regard performance of *Pani Panchayat* in Odisha seems to be bypassed by local institutions and conditions (Sahu 2008). This has resulted in low participation of women and weaker sections, poor water management and inadequate capacity development to improve water use efficiency and agricultural productivity. Considering household's multiple water needs as the starting points, it is often argued that access to water supply in drought prone areas is an effective way to improve livelihood, reduce poverty and enhance gender equity. The present paper will highlight some of these issues in regional and group perspective.

OBJECTIVES AND METHODOLOGY AND STUDY AREAS

The broad objective of the paper is to highlight dimensions of gender equity in water and agriculture in

drought regions with focus on livelihood and food security. Some specific objectives are given below.

- To discuss whether impact of scarcity or drought (water, employment, food, fodder etc.) is gender neutral.
- Household risk sharing during stress period with focus on women (intra household risk sharing) in drought affected areas.
- Suitable policy suggestion to enhance women's access to water and productive resources to improve household livelihood and food security.

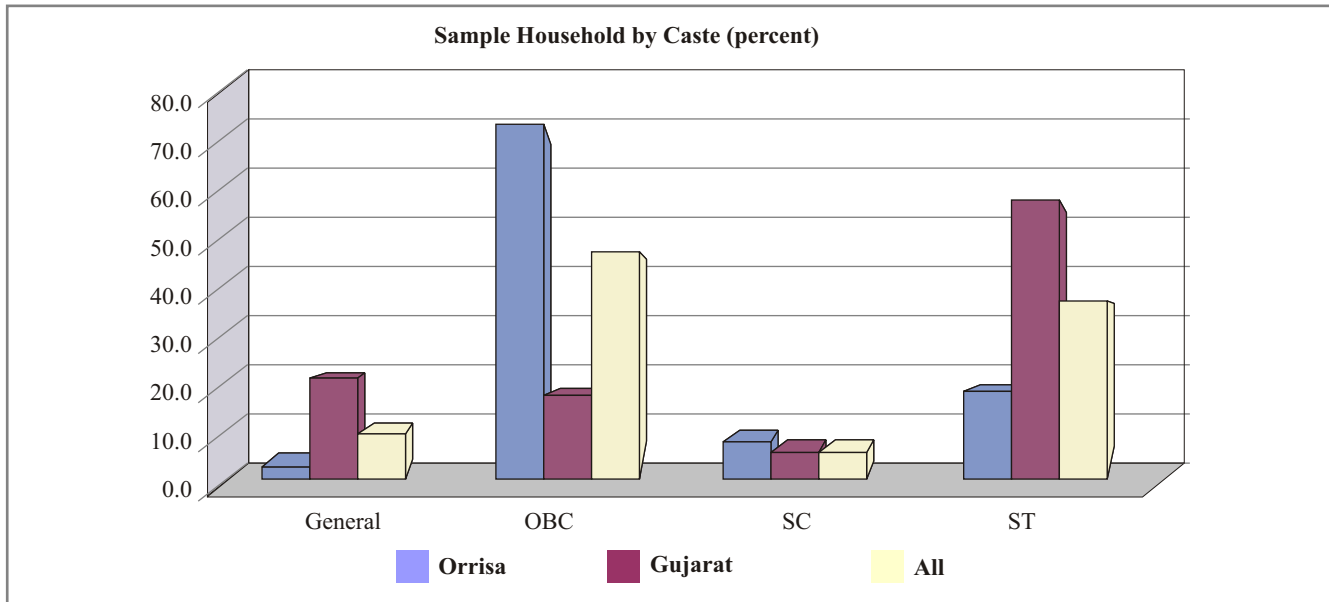
Understanding gender equity is methodologically challenging: firstly because of the complexity of inter regional and inter group diversities and secondly because lack of correct baseline data. Here effort is made to highlight some broader aspects of gender equality and our focus will be on inter and intra region and group contexts.

A three stage approach was followed for assessing women's participation in agriculture, water, coping strategy and other aspects with emphasis on regional and group specific features in Odisha and Gujarat. Intra household risk coping behavior has been reemphasized to argue whether access to water and impact of water scarcity is gender neutral or not. Some local adaptation and practices to minimize food and water scarcity and its impact on gender are discussed in the context of both tribal and non tribal and low and high rainfall regions. Selection of study areas for survey was based on areas which are primarily drought prone³ (moderate to severe) and where subsistence small scale agriculture is a major livelihood activity.

Table 1 Selected field sites in Odisha and Gujarat (field survey 2009-10)

S. No.	State/ District	Taluka/ Block	Drought area	Regions	Type of irrigation
Odisha					
1.	Bolangir	Turekala	DPAP	Tribal	Community (<i>Pani Panchayat</i>)
2.	Kendrapada	Rajnagar	DPAP	Coastal	Community (<i>Pani Panchayat</i>) Canal, River
Gujarat					
3.	Surendranagar	Lakhtar	DDP	Inland	Well
4.	Panchmahal	Halol	DPAP	Tribal	Well

³The term “drought prone” is often used loosely and ambiguously. In Bangladesh it is sometimes used to refer to the driest parts of the country – the “dry zone” – where the mean annual rainfall and short length of rainy season impose restrictions on agricultural production which are not experienced in wetter parts of the country. It is also used to refer to areas that have soils with low capacity to store moisture and, therefore, dry quickly during the period when rainfall is below average and stay dry for a long period during the dry season.

Figure 1 Distribution of sample households (HH) by caste

Source: Field Survey (2009-10)

Our sample villages broadly represent two groups, one is tribal dry area and other is nontribal irrigated areas. Sources of water were local water bodies, community tube wells, private wells and other local arrangements mostly of traditional and hereditary.

It may be noted that Other Backward Classes (OBC) households, particularly in Orissa (73 percent of total HH) are not in much better position than backward castes. Most of these households are Below Poverty Line (BPL).

AGRICULTURE, WATER AND GENDER IN STUDY AREAS

Poverty and rising biotic stress is believed to be high in dry regions due to water scarcity thereby affecting livelihood of the poor and women. Public intervention to promote alternate water provisioning like watershed development, community irrigation, tube well and institutionalizing it through people's participation is found in operation in the study area. In this context, *Pani Panchayat* in Odisha and initiatives by the local community in Gujarat for water management and development are well documented (Sahu 2008). But the problems of conservation and distribution of water at community level continue to be biased against poor, women and weaker sections because of several factors. As expected, the participation and representation of women in water sector, particularly in decision making was found abysmally low in the study areas.

Both Odisha and Gujarat continue to experience high frequency of droughts in recent years with varying intra region and inter region severity and frequency⁴. Despite high rainfall (1400 mm/year) Odisha experiences frequent water scarcity. Gujarat receives average annual rainfall less than half of Odisha but the state has initiated community level water management programs and watershed development unlike Odisha. However there are some commonalities between the two states - occurrence of drought, substantial tribal population, peasant farming, out-migration, new institutions and initiatives in water sector etc. But much is not known about impact of water scarcity on women in both of the states having different water resources and management.

DROUGHT IN STUDY AREAS: HOUSEHOLD PERCEPTIONS AND PRIORITY

Drought has been historically associated with water scarcity, food shortage and lack of livelihood of varying intensities. Data presented in Table 2 shows some basic understanding about drought impacts from a regional perspective and in terms of household priority, which can have both direct and indirect implication on gender. This is in contrast to uniform public policy interventions for most of the drought prone areas. Odisha with its high rainfall faces severe water and food shortage unlike Gujarat which despite being water and food deficit state⁵ manages water resources and food better.

⁴In the past ten years, both of the states have been hit by severe drought for about three to four times.

⁵deficit in terms of domestic food production

Table 2 Major impacts of water scarcity in study areas (percentage of HH)

		HH (No.)	Failure of major food crops	Dry land mass	Crop failure at different stages	Scarcity of annual rainfall	Continuous dry spell	Loss of crop yield	Others	Total response
Odisha	Tribal	35	97.1	0.0	0.0	2.9	0.0	0.0	0.0	100
	Non tribal	41	63.4	4.9	12.2	17.1	0.0	0.0	0.0	100
Gujarat	Tribal	45	26.7	2.2	0.0	22.2	22.2	8.9	37.8	100
	Non tribal	42	14.3	7.1	0.0	32.4	31.0	0.0	45.2	100
All	Tribal	80	62.5	2.5	6.3	10.0	0.0	0.0	0.0	100

Source: Field survey (2009-10)

More than half of the total respondents reported that adverse impact of shortfall in food and water during drought was on women and it was worse in the tribal areas, particularly in Odisha. Women's work participation is higher among the poor and the landless in dry regions with high male out-migration. Both of the states were badly hit by water scarcity where women seem to be worst affected, but the situation in Odisha was far more severe. Food shocks were seen to be far more severe than those such as health impacts or unemployment etc.

About 45 percent of tribal households in Odisha reported having health problems. Since health problems, especially among women, were not given much importance by poor households even during normal year, it is possible that household priority for food will undermine their health shocks. Water related health problems were dominant in the study areas followed by pre-mature deaths, pregnancy related problems and weakness due to inadequate food and drinking water. It may be noted that relatively lesser decline in food expenditure in Odisha than Gujarat does not imply that households were better off in Odisha as many of them do not have any specific food budget and they do manage shortfall in food consumption with local food arrangement from forest and other sources. In most of the cases female members have to make local food and water arrangement depending on the seasonal conditions and access to these sources and share disproportionately unequal burden.

In response to local scarcity conditions (inadequate food, employment and water) many households opted out-migration as an important strategy to meet income and consumption shortfalls but it resulted in shift of larger part of the burden to non migrating female members. However, the cost of scarcity induced out-migration was not gender neutral across regions and social groups. It was more of distress driven in Odisha tribal areas than their counterparts in Gujarat and in irrigated areas. Apart from

liquidation of assets and rising food process it was seen that more number of women were undertaking manual labor than men. Caste discrimination was also observed in some cases. Under this situation provision of assured water availability and local food production are thus important for livelihood security.

ACCESS TO WATER IN STUDY AREAS

Our observations from the survey areas reiterate that work burden on women get multiplied with acute shortage of water. It increases on the scale of scarcity and access to resources and women managing it in the absence of their migrant male members reported having a lot of health problems in both of the study areas. As magnitude of water crisis differed across regions and land size classes, access to any dependable water source in drought prone area would be more beneficial to women. For the landless managing water scarcity was tough as they had no direct access to functional water sources. Many of them could not afford to have private tube wells or other water sources and those who have do not share with. Local caste and social practices also hinder access to water in study areas. Evidence of poor management of community water and unequal access to water emerged clearly from the field survey.

Overall, hardship on women, while managing with nearest available and accessible water, is likely to arise in dry areas though it may vary with land size classes. About 77 percent of households in tribal areas in Gujarat reported increase in hardship of women to fetch water during stress period. The situation was not better in Odisha. It may be noted that hardship in arranging for water is not confined to fetching water from distant sources but also uncertainty in accessibility, cost, quality and quantity of water. In some cases, opportunity cost of water gets translated into several working hours of women and it is accounted for within the family.

Table 3 Source of household water arrangement and water scarcity in study areas (in percent)

		HH managed water scarcity (percent)	Source of Water					
			Community hand pump/ well/ ponds	Water Users' Association pond/ Watershed Program	Public provision/ canal/ lift irrigation	River/ lake/ reservoir	Total	Rise in hardship for women (percent)
	Odisha							
Tribal	Landless	19	69.4	5.6	19.4	5.6	100	76
	Total	35	63.7	9.9	17.6	8.8	100	62
Non tribal	Landless	25	68.0	8.0	24.0	0.0	100	34
	Total	56	74.1	10.4	15.6	0.0	100	33
	Gujarat							
Tribal	Landless	20	73.9	21.7	4.3	0.0	100	88
	Total	30	71.4	23.9	3.3	1.4	100	77
Non tribal	Landless	25	75.9	9.4	0.6	14.1	100	66
	Total	36	56.2	35.5	0.2	8.1	100	62

Source: Field Survey (2009-10)

WATER SCARCITY AND CHANGE IN HOUSEHOLD OCCUPATIONS AND FOOD CONSUMPTION

Under severe water scarcity households tend to engage in multiple occupations to minimize income and consumption shortfalls but all such efforts may not be gender neutral. We observed that during scarcity period large number of women participated more on low return multiple activities, worked for longer hours, undertook riskier occupations and involved in seasonal and forest based activities etc. Participation in public works programs like MGNREGA also reported. Men, with a little more diverse skills and better mobility were found to migrate out while women were to stay back home with fewer options. Water scarcity that reduces normal land based activities and local employment unequally and adversely affected women members in the family. But the situation was not similar in all study areas.

Declining agricultural wage labor in Odisha is a matter of concern and the trend was more pronounced in tribal areas where local and forest based activities also declined. Livestock activity drastically declined during drought period. It perhaps pushed many women into low return occupations which are gender biased. It further distorted the nature and pattern of household occupation, income, work conditions and resource use. This could be largely due to inadequate access to basic resources like land and water.

GENDER EQUITY AND HOUSEHOLD CONSUMPTION COPING STRATEGIES

Our field data provides evidence which shows that consumption shortfall is direct fallout of crop failure, loss of farm income and increasing dependence on market for food. It is also evident that households reduce their quantity and frequency of food intake as a part of risk aversion strategy where women and elder members contribute the most. About two-thirds of respondents experienced a fall in quality of food, imbalance in diet and drop in consumption of vital items like milk and milk products, vegetables, etc. It has very serious implication on women and children. Loss of income and crop production induced adjustment in household consumption was found to be highly gender biased - distress sale (utensil, livestock, crop output), withdrawal of children from school (mostly girls), consuming seeds, consumption of low value food (by females). In tribal areas, there was a shift reported in staple consumption.

INTRA HOUSEHOLD FOOD CONSUMPTION

Intra household food consumption adjustment with visible gender inequality in the study areas was observed. In response to the question “who faced bigger drop in food consumption in the household”, it was found almost all people were affected but more in tribal pockets and among women and both in quantity and quality. About

two-third of them reported higher degree of decline. In non tribal areas the high reduction in food consumption during scarcity period was also reported but only at lower level (less than 10 percent).

It is thus evident that a disproportionate amount of the shortfall in food consumption in the poor household was shared by women. Children were perhaps 'protected' to whatever extent possible. This pattern implies a discrimination against the female members of the family who appear to be 'sacrificed' in favour of the working male members and children in the household. Strong presence of gender discrimination was unmistakably reiterated if one looked at the decline in food consumption by sex, region and land size groups. Very high portion of women (71 percent in tribal area and 59 percent in non tribal area), reported their reduced food intake. However, this was true of men of tribal areas only. Gender inequality in allocation of food within household partly explained by the traditional custom and practices, however, shortage of food during scarcity is the reality and it has been manifested in the form unequal share of work burden, sharp consumption shortfall, unequal access to resources ownership, under representation in decision making and poor human development. Existing scarcity and inequality in water sector appears to aggravate gender inequity across regions and social groups. But the trend improves in developed and irrigated areas where food production and consumption was found to be better. Poor access to water in agriculture and increasing involvement of women in agriculture is bound to have serious implications for their health and well-being which does not ensure improvement in gender equity.

CONCLUSION

Though a disproportionate amount of the shortfall in food consumption and other expenditure was absorbed by women, people's perception and priority about water scarcity do not go beyond crop failure and income loss. It has serious implication on intra household gender relations and overall gender equity. In a broader sense, low and unequal access to water and land is viewed as increasing adverse impact on women in terms of their participation, resource management and well being. Our analysis supports the argument that women in agriculture share higher work burden with little or no access to resources like land, water, credit and other inputs. Increasing water scarcity and failure of community based water management, particularly in drought prone areas fail to improve livelihood conditions of poor and women. Distress conditions in agriculture, out-migration, informal borrowing, poor risk coping capability evident in the water scare regions continue to pose challenges for gender equity.

Households as decision making units tend to use women members for 'labor smoothing' and 'consumption smoothing' but without adequate availability and access to resources. Existing intra household gender relations continue to be gender biased with different extent at different region and groups. Therefore, region and group specific policy to expand access and ownership of water and land to women in agriculture need further policy attention. For this strengthening of local water institutions, conservation and management of resources, ensuring women participation and decision making are reemphasized.

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About the IWMI-Tata Program and Water Policy Highlights

The IWMI-Tata Water Policy Program (ITP) was launched in 2000 as a co-equal partnership between the International Water Management Institute (IWMI), Colombo and Sir Ratan Tata Trust (SRTT), Mumbai. The program presents new perspectives and practical solutions derived from the wealth of research done in India on water resource management. Its objective is to help policy makers at the central, state and local levels address their water challenges – in areas such as sustainable groundwater management, water scarcity, and rural poverty – by translating research findings into practical policy recommendations. Through this program, IWMI collaborates with a range of partners across India to identify, analyze and document relevant water-management approaches and current practices. These practices are assessed and synthesized for maximum policy impact in the series on Water Policy Highlights and IWMI-Tata Comments.

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