

# Gender, Water and Climate Change: The Case of Pakistan

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PWP Policy Paper Series

## **Editors' Note**

Pakistan Water Partnership the country chapter of Global Water Partnership has undertaken to publish a series of technical papers on water issues and challenges faced by Pakistan. In this endeavour, the first technical paper titled “Gender, Water and Climate Change: The Case of Pakistan”, is being issued. The remaining aspects of water include in particular climate change impacts and adaptation; dams and development; integrated water resources management; groundwater governance; gender role in water partnerships; glacial resources study; moving towards water policy; rain harvesting and conservation technologies; flood and drought mitigation/adaptation etc. will be published in 2013-2014 time following peer review.

These papers will be published and would also be available on PWP website ([www.pwp.org.pk](http://www.pwp.org.pk)) in the public domain for general awareness and benefit.

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<sup>1</sup> Please note that this research doesn't necessarily reflect Oxfam's position

# Table of Contents

Introduction.....	03
Mapping of Gendered Dimensions of Agricultural Water Management and Use....	03
A. Women's Role in Agriculture.....	03
B. The Role of Women as Water Users and Managers.....	05
Women and Water-Related Hazards.....	08
Policies impacting upon women's vulnerabilities to climate change.....	09
Opportunities for Gender Engagement.....	10
Recommendations.....	10
References.....	11

## Introduction

Pakistan, long renowned for its Indus Basin Irrigation System, the largest contiguous irrigation system in the world, is on the verge of drying out, with potentially dire consequences for people's livelihoods and food security. Per capita water availability has plummeted from 5,000 cubic meters (m<sup>3</sup>) per capita in the late 1940s to 1,080 m<sup>3</sup> in 2010, and is projected to further decline to 850m<sup>3</sup> by 2030, well below the threshold of World Health Organization (WHO). In this context of increasing water scarcity, climate change impacts on water resources are likely to be acute. The Government of Pakistan's National Climate Change Policy recognizes that climate change will be one of the main driving forces of change for water resources management, given the 'projected recession of Hindu Kush-Karakoram-Himalayan glaciers.... threatening water inflows', 'increased temperature resulting in... water-stressed conditions, particularly in arid and semi-arid regions, leading to reduced agriculture productivity', 'increased intrusion of saline water in the Indus delta, adversely affecting coastal agriculture, mangroves and breeding grounds of fish' and 'increased stress between upper riparian and lower riparian regions on sharing the water resources'.

Climate change is increasingly being recognized and addressed as a challenge, but responses to it, so far, have not sufficiently focused on significant gender dimensions. As weather patterns become increasingly unpredictable and extreme events such as floods and drought become more common, the poorest communities, especially those dependent on natural resources, are finding their livelihoods most threatened. Women living in poverty are most vulnerable to the impact of climate change and disasters due to inequitable power relations and to unequal access to natural resources such as land and water and to development resources such as credit, trainings, information, and agricultural inputs.

Dealing with climate change impacts on water resources requires pro-active partnerships, to contribute not only to more efficient use of water, but to also harness pro-poor and gender equitable agricultural growth. This paper presents major issues and constraints relating to the water, climate change, and gender nexus in Pakistan, and explores opportunities for promoting gender engagement in agricultural water management, in the context of climatic variability and change. The paper is based on literature review and findings of field research in Sindh are also presented as case study of inter-relationships between gender, water, and climate change. The field research in Sindh, based on participatory research methods, was conducted by Laar Humanitarian Development Program (LHDP) and Research and Development Foundation (RDF) in six villages in Badin and in Jamshoro districts.

## Mapping of Gendered Dimensions of Agricultural Water Management and Use

### *A. Women's Role in Agriculture*

Agriculture is the backbone of the Pakistani economy. Two-thirds of the population and 80 percent of the country's poor live in rural areas and many depend on agriculture as the prime or secondary source of income. Pakistan's agriculture sector is also the main user of water, with more than 95 percent of the country's available water sources allocated to agriculture.<sup>6</sup>

It is an economic sector that is particularly important for female employment in Pakistan. In 2010-2011, 74.2 percent of working women were concentrated in the agricultural sector; by contrast, during the same period, only 34.7 percent of

working men were employed in the agricultural sector. It is likely that women's engagement in agriculture is higher than employment figures suggest, as these do not reflect women's unpaid work in livestock management and vegetable farming for example. Most of female agricultural workers moreover are concentrated in 'subsistence-level farming under harsh conditions and with little or no economic security'.

Literature review suggests that the extent to which women are engaged in farming and livestock activities in Pakistan depends on a range of factors, including socio-cultural norms, agro-ecological conditions, and migration patterns. In rain-fed (*barani*) communities, such as Chakwal in northern Punjab, where men have shifted away from agricultural production to diversify household income, more women have taken over the management of family farm. By contrast, in canal-irrigated communities in Sindh, where agriculture trends to be more market-oriented, cotton-picking offers paid opportunities for women. In Balochistan, where socio-cultural and patriarchal norms are more binding, agriculture is almost the sole employer for rural women employing over 91 percent of the rural female workforce. Ethnographic research also highlights that women are taking on more agricultural tasks as a result of male out-migration.

Women play a major role in farming activities such as sowing, transplanting, weeding and harvesting, as well as in post-harvest operations such as threshing, winnowing, drying, grinding, husking and storage, while men tend to play a major role in land preparation, fertilizer application, threshing, off-farm transport, and marketing. In livestock rearing, women collect fodder, clean animals and their sheds, make dung cakes, pump milk, process animals' products such as cheese, butter, yogurt, and market them. Gender division of labor in the livestock sector in Punjab, according to 2009 field research, clearly indicates 'that most livestock related activities are undertaken by females', with men's role being concentrated on grazing. Women also graze animals, but due to socio-cultural attitudes regarding female mobility in Punjab, women graze animals on fallow lands near homestead or near the periphery of villages. These findings corroborate research conducted in the late 1980 and 1990s, which highlighted that livestock production and management is mainly women's responsibility, especially in *barani* agriculture. Participatory research in Sindh also confirm a clear gender division of responsibility with respect to productive work, with women's work valued less because it is viewed as part of household subsistence rather than cash economy. For households dependent on livestock, tasks such as arranging fodder and milking the cattle are in addition to reproductive responsibilities including child rearing, caring for the health of household members, especially the elderly, collecting fire wood, cooking food for whole family, cleaning the house, collecting water for household use.

Largely due to unequal distribution of natural resources, moreover, poor women are not able to efficiently engage in agricultural activities and generate sufficient income. Only 37 percent of rural households own land and 61 percent of these land-owning households own fewer than five acres, according to the 2000 Agricultural Census. Land rights are especially challenging for women who are usually denied inheritance and property rights. Although gender disaggregated data on land ownership is not readily available, the Pakistan Rural Household Survey of 2001 found that women only own 2.8 percent of plots. Moreover, even



when women do have a legal claim to land, customs may prevent them from taking *de facto* control of land. In focus group discussions with women in Badin district for example, 'religious hurdles' were perceived as the main factor constraining women's access to land in their communities, while in Jamshoro, it was stated that 'even when women obtain land titles, they end up transferring these to male members of the family', with consequences that 'less than a fraction of a percent of women probably own land in Sindh'.

As the ownership of land remains a proxy for water rights, and very few women own agricultural lands, moreover, their water rights remain 'ill-defined'. Access to agricultural water remains extremely limited for women, perhaps especially so in areas prone to water shortage, including *barani* areas, in lands at the tail end of watercourses, and areas with saline groundwater.

### ***B. The Role of Women as Water Users and Managers***

The management of water resources has gendered impact through its effects on food security, agricultural production, domestic water supply, sanitation, and health.

The gendered dimensions of water use are fairly well-documented in Pakistan. It has long been noted that women and girls are mainly responsible for collecting drinking water, especially in rural areas where water infrastructure tends to be poor and where communities are prone to water shortages. According to the government's 2010 Millennium Development Goal (MDG) Report, access to improved drinking water sources remains a challenge, due to water scarcity, surface water pollution, and an estimated national 65 per cent coverage rate in water supply, well below the MDG goal of 93 percent coverage rate by 2015.

A number of surveys confirm that rural women, especially in 'water stressed' communities spend a high proportion of their time collecting water. The Pakistani Rural Household Survey of 2001 found that 25 percent of women reported fetching water during the week prior to the survey; in water stressed communities, the percentage of women spending time collecting water increased significantly to up to 60 percent in rural Balochistan and 40 percent of women in rural Sindh. Research shows that when access to drinking water services worsens, women, not men, bear the higher time costs and according to one study, households in some rural communities could save as much as 1,200 hours per year if water was available within the home. Difficult access to water increases women's work load and reduces time that could be allocated to other productive activities. In particular, in Pakistan, putting water sources closer to the home has been associated with increased time allocated by women to market work.

It is important to note that patterns of water collection are likely to be dependent on season and climatic factors. Decreased water availability due to climate change will therefore not only impact the agricultural potential for women farmers to produce food and to generate income, it will also impact upon their time usage. Climate change impacts, including drought, saline intrusions into water sources, erratic rainfall, will all cause women to work longer to secure water resources for domestic use. This means that women may have even less time to earn an income or to access education, training, or other opportunities.

Primary research conducted in Sindh for this paper shows that climatic variability is already starting to impact upon the livelihoods of poor rural communities which are highly dependent on agriculture. According to the respondents of the research, monsoon seasons have been shifting, rainfall patterns have become increasingly unpredictable and temperatures have been rising causing longer summer seasons, as a consequence the ecology has also changing. The first and foremost concern of women is the impacts of these climatic changes on their food security their and earning capability. Participatory research in South Punjab, conducted by Doaba Foundation, also confirm that rural communities are clearly noticing changes in seasons and unusual weather patterns which are adversely affecting crop and livestock production (See Box 1).

**Box 1: Community Perceptions on Climate Change Impacts, South Punjab and in Sindh**

Crop farming and livestock production are being increasingly difficult for small-scale farmers in South Punjab, due to erratic and unpredictable rainfall. According to an interviewed woman in Muzaffargarh 'we have no rains when needed for agricultural fields'. Another farmer stated, 'for the last four to five years, we have seen that rain does not come when needed; instead it come close to harvesting season. This makes us everything that we have worked for over the months. Women's health is also being affected by extreme heat during wheat harvest "previously we used to work every day of the week, now we don't have the energy to work after two days," affirmed a respondent. An interviewed woman in Moor Thaheem village in the Muzaffargarh District reported that groundwater is drying up and hand pumps are no longer useful. She also expressed concern regarding the safety of your daughters' whose responsibility it is to fetch water. "My young daughters usually collect water for household use from neighboring which is risky sometime in the evening due to dog biting and rivalries". Livestock is also being affected: now there is extreme shortage of fodder for these livestock, as natural bushes and plants in riverine belts of South Punjab are vanishing at an alarming rate.

In Sindh, data from the field reveals that farmers have started to modify their agricultural practices. In focus group discussions, participants stated that instead of growing wheat, increasing number of farmers are growing pulses, and late sowing and harvesting is increasingly practiced. Climatic variability may be impacting women's workload more than that of men. As men are responsible for buying seeds and sowing crops, their farming responsibilities end earlier than those of women, who more tied to the fields until harvest time. Respondents stated that women are responsible for replanting if first planting is unsuccessful; moreover, crops now twice as much watering as before. "So women have to work harder and longer in this way", concluded an interviewee.

Potential impacts of climate change on the availability of water have other gendered implications related to women's reproductive duties. Increased frequency or severity of droughts, floods and other water related hazards will put already over-stretched sanitation systems under further stress, increasing the risk of water-related diseases. Already, diarrheal diseases caused by poor water and sanitation situation are one of the main causes of mortality for children under the age of five. The heightened risk of consumption of contaminated water will



therefore place increased pressure on women's reproductive tasks of caring for the health of household members.

Literature review suggests that gender and water discussions in Pakistan is usually framed within the domestic sphere – for example time spent on water collection for domestic use or availability of adequate water and sanitation services – while linkages between gender and agricultural water are less well documented. Statistics on the management and use of different types of agricultural water resources that are disaggregated by gender are not readily available, and the essential problems faced by many women farmers – access to water for agricultural purposes – have still not received sufficient policy attention. This is despite the general acknowledgement that one of the most efficient manners to improve agricultural output of small landholdings is year round irrigation, supplementary irrigation, water harvesting and other water conservation techniques. Increased access to water is also indispensable for landless women engaged in livestock. As the evidence and case studies indicate, women do not have sufficient access to agricultural development resources including irrigation services. In spite of women's agricultural responsibilities, 'women's roles in irrigation are frequently overlooked by agricultural extension agents and water engineers'... and women 'have played a relatively small role in public decision making about water management'.

More thorough policy and action research is needed in Pakistan to ensure that legal and socio-economic constraints faced by women in different agro-ecological zones in accessing agricultural water are addressed in the design or management of irrigation projects. For example, according to a 2011 social assessment study on the Punjab Irrigated-Agriculture Productivity Improvement Project, women farmers are more likely to prefer high efficiency irrigation systems– such as drip, sprinkler and bubbler – as these do not 'require night irrigation as well as other field work generally not considered culturally appropriate for women e.g. diversion of water from channels, tilling etc'. In general, there are grounds to question whether water projects have prioritized irrigation technology and hydropower dam construction, and have not sufficiently focused on common resources such as watersheds, freshwater fisheries, and wetlands for food and subsistence, which are of critical importance to women farmers and livestock breeders.

Despite increased policy discussions on the importance of water and gender over the past few decades, moreover, institutional arrangements for the management of water resource largely continue to exclude women. Empirical research from the late 1990s suggests that women's participation in water users' organization has been severely limited. For example, according to a 1998 study, women were found to be included in decision-making in only two out of 35 rural water supply schemes studied. Similar to the area of water supply and sanitation, women's participation in irrigation water management bodies has been limited. In the context of irrigation water, for example, according to a 2006 report by the Sustainable Institute Development Policy Institute (SDPI), 'men are seen to best represent the water-related interests and needs of the household, and the congruence of interests between men and women is assumed'.

Differing perspectives between women and men are therefore not rendered sufficiently visible within bodies such as Provincial Irrigation and Development Authorities, Area Water Bodies, Water Users Associations, Farmers' Organizations, where women are not sufficiently represented. According to a

2011 report, 'medium-size and small farmers, as well as haris (sharecroppers) or wage laborers, may be members {of local water management}, but there is a propensity for the big landowners to appropriate leadership...Since women do not have a clearly defined right over land as a proxy for water rights, their interest in participatory water management is not too high'.

Women's limited participation in the formal management of water resources must be looked at in the broader context of the social construction of gender roles, and their restricted access to resources and public decision making bodies.

## **Women and Water-Related Hazards**

Pakistan has shown high exposure and vulnerability to natural disasters, which can take a high toll in human lives, destroy livelihoods and assets, and push additional people to fall into poverty. From 1980 to 2010, the country experienced 138 natural disasters, which have killed over 87,000 people and caused economic damage of over US\$18 billion. During the 2010 monsoon season, 'the country experienced the worst floods in its history, affecting 78 of its 141 districts and more than 20 million people ..... More than 1,900 people lost their lives, and about 1.6 million homes were destroyed'.

With climatic variability and change, extreme weather events are set to become more frequent and intense, resulting in a substantial increase of water-related hazards resulting from too much water (causing floods, landslides, and mudslides) or too little water (causing droughts, saline encroachment...). The gendered impacts of water-related disasters risk eroding even further women's livelihoods and security.

Numerous studies have demonstrated that women bear the disproportionate burden of the costs of disasters, especially if their rights are not ensured and if gender inequalities are not addressed. Gender assessment conducted by United Nations (UN) Women in Pakistan following the 2010 floods for example suggests that women may have less access to means of communication. The report moreover demonstrated that flood camps did not have sufficient arrangements for washing nor hygiene services for menstruating girls and women, and that women reported cases of sexual harassment in camps where there mixed groups, leading women to feel exposed, vulnerable or threatened. The assessment report further stated that due to gender division of labor, women continued to face the responsibility of water disposal, cleaning, fetching water and maintaining the health of family, but without the necessary resources of means to do so. Data collected from the field also confirm that collecting water and fuel food in the aftermath of floods were perceived as particularly challenging tasks for women respondents in Sindh.

The preliminary damage and needs assessment report of the 2010 floods of the Asian Development Bank (ADB) furthermore highlights that gender implications of disasters as 'in periods following disasters, women's medical, hygiene, and nutrition needs are frequently neglected; girls' education is not prioritized. In the absence of recognition of women-headed households and virtual invisibility of the economic contribution of women, livelihoods for women are not a priority'. According to another field-based research on the gendered impact of 2010-2011 floods, some local organizations in Sindh had managed to collect gender and

vulnerability assessment data at village level, however, they had been unable to use gender disaggregated information for making shelter projects more gender-sensitive throughout, since they lacked gender expertise. 'Women's voices remained unheard, therefore, in the process of designing the shelters, and in the allocation of and access to productive resources'.

## **Policies impacting upon women's vulnerabilities to climate change**

Competition over water resources is likely to intensify with climate change impacts. Climate change impacts – changes in temperature, precipitation, incidence of extreme events, sea level and glacial cover – are expected to affect water availability, adversely affecting agricultural production, nutrition, health, and household incomes. Impact of climate variability and on water availability will be distributed differently between men and women as well as between households across agro-ecological zones and income and vulnerability levels. Gendered differences in access to water, usage of water and overall water resource management have clear policy ramifications. If water needs of women and men are viewed as homogenous by government policies, then these may contribute to further marginalize women.

The National Climate Change Policy of Pakistan, the goal of which is to 'ensure that climate change is mainstreamed in the economically and socially vulnerable sectors of the economy and to steer Pakistan towards climate resilient development'. Recognizing that 'women are powerful agents of change' and that 'women are more likely to be strongly affected by climate change', the national policy includes a number of gender-sensitive policy objective and measures, such as: mainstreaming gender perspective into the climate change efforts at national and regional levels; reducing the vulnerability of women to climate change impacts, particularly in relation to their critical roles in rural areas in provisioning of water, food and energy; undertaking comprehensive study on the gender-differentiated impacts of climate change; developing gender-sensitive criteria and indicators related to adaptation and vulnerability as gender differences in this area are most crucial and most visible.

Yet, despite acknowledging the importance of integrating gender issues into climate change processes most of the debate on climate change and water so far has been largely gender-blind, and the important role played by women in agriculture has seldom been given consideration in water resource planning. It is clear that women are significant users of water both for productive and for domestic purposes but that they rarely have input into water decision making, either at the macro or at the micro level.

Of critical importance is the under-representation of women in policy and decision-making institutions, including in dialogue on adaptation to climate change, in the governance of natural resources and in other important livelihood dimensions. In Pakistan, women are under-represented in senior posts in Agriculture, Livestock, Water, and National Disaster Management Ministries and Departments, and their participation in climate change negotiations and processes is woefully limited. At the local level, according to one study in Khyber Pakhtunkhwa, women farmers believe there are hardly any institutions, which they can rely on for getting climate related information that can help them adapt their livelihoods decisions to the changing climate.

## Opportunities for Gender Engagement

Ensuring gender engagement in the context of increasing water scarcity, climate change and variability requires that the commitment of the Government of Pakistan, donors, civil society organizations, academic institutions, and private sector. Pro-active partnerships are needed especially since climate change impacts on water resources will exacerbate challenges such as food security, poverty and inequalities. A number of promising opportunities exist and need to be harnessed to ensure that women in impoverished rural communities are better able to access and utilize water resources in the context of climate change.

- As national plans and strategies on water and climate change are being drafted and operational plans being developed, this represents an opportune moment to ensure that gender dimensions of climate change are highlighted. Gender differentiated impacts of climate change on water availability, quality, and allocation need to be assessed and social, economic and political inequalities heighten women's vulnerability to climate change need to be addressed.
- Civil society working groups on climate change, comprising of representatives from national and international organizations can serve as a vehicle for information sharing and networking on gender equality, and influencing government policy and processes on gender, climate change and water.
- Civil society organizations in Pakistan that work very closely with marginalized communities are perhaps best placed to highlight issues related to climate change, water, and gender with the help of case studies. These organizations can provide evidence-based policy research according to different agro-ecological zoning.
- Emerging private/public partnerships and private sector engagement in irrigation development and management is increasingly being viewed as an opportunity to redress challenges facing irrigation systems, including poor standards of management and maintenance and sub-optimal performance as manifested by water losses and low water use efficiency. Efficient and low cost irrigation technologies marketed through the private sector may have the potential to address current gaps in gendered access to irrigation water.

## Recommendations

Addressing climate change impacts on water requires pro-active and multi-stakeholder partnerships that promote efficient, gender equitable, and sustainable use of water in the context of increased vulnerability to climatic variability and change. Concrete recommendations, at national and community levels include:

- The capacity of academic and research institutions to analyze and advocate for water policies conducive to accelerated pro-poor and gender equitable agricultural growth and improved food security needs to be enhanced. As a pre-requisite, research base on gender, agricultural water, and climate change nexus, including through improved gender sensitive data collection and analysis systems, needs to be enhanced.
- Pakistan's water policy and strategy needs to be designed and implemented in light of climate change in particular the concept of agro-climatic zoning needs to be emphasized, with potentially different mixture of policy measures according to each zone.
- Donors should also ensure that gender analysis is fully integrated into irrigation funding, to ensure that multiple water-related priorities of women



farmers and agricultural wage workers are addressed.

- The role of international agencies, namely development banks and bilateral donors providing a significant proportion of the funding for large-scale water projects, in developing gender sensitive perspectives, is also an area that needs to be more critically assessed. Gender sensitive water governance policies and guidelines for management of the country's groundwater resources, including during humanitarian disasters, should be established.
- At the community level, to address water shortages, more needs to be done for rural women and youth who bear most of the brunt, through investment in water storage infrastructure (surface water and groundwater), watershed development, rainwater harvesting, water conservation and community initiatives that better integrate land and water management. These initiatives should be gender sensitive to ensure for example that women farmers as well as men have access to heat tolerant crops or fast maturing crops or training sessions on how to increase soil's organic content and or water-conserving crop-management practices or that women are consulted on the design of appropriate water capture and storage systems. In general, at the community level, women's involvement in participatory community planning process for climate adaptation and disaster risk reduction should be actively promoted.
- Targeted efforts should be made to identify potential women leaders in rural communities and provide them with the training and skills to become active members of water users associations. Efforts should be made to provide gender training to water users associations, where possible and relevant.
- The capacity, including gender expertise, of local civil society organizations to work on behalf of and to advocate on the priorities of communities in different agro-ecological zones, affected by climate change, needs to be enhanced.
- Livelihood opportunities for women, particularly female headed households, need to be created, through private sector engagement, including rural livelihood diversification; migration/resettlement, as a primary response to climate change stresses should also be further explored.
- Local and national disaster risk reduction plans should emphasize the protection of women's rights, during and after disasters that are exacerbated by climate change.

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The Global Water Partnership (GWP), established in 1996, is an international network open to all organizations involved in water resources management: developed and developing country government institutions, agencies of the United Nations, bilateral and multilateral development banks, professional associations, research institutions, non-governmental organizations, and the private sector. Its mission is to support countries in the sustainable management of their water resources.

Through its network, the GWP fosters integrated water resources management (IWRM). IWRM aims to ensure the coordinated development and management of water, land, and related resources in order to maximize economic and social welfare without compromising the sustainability of vital environmental systems. The GWP promotes IWRM by facilitating dialogue at global, regional, area, national and local levels to support stakeholders in implementing IWRM.

Pakistan Water Partnership (PWP) was established in February 1999 as the country chapter of Global Water Partnership (GWP). It is an important member of the regional network Global Water Partnership – South Asia (GWP-SAS). It is a corporate body registered under the Pakistan Companies Act 1984, with a large number of key stakeholders from Government Organizations, Public and Private Sector, NGOs, Women and Youth Groups, and Civil Society having impact on water or being impacted by water and its uses in the country as its members/ partners.