

Enhancing economic assets

A strong asset base, ownership of liquefiable assets, and access to financial services such as credit and insurance can assist poor women and men to cope with losses arising from climate extremes and economic shocks. In South Asia, women's self-help groups and networks for savings, as well as micro-credit banks for the poor (such as Grameen and SEWA) have enabled women to build their financial assets, and many have felt more empowered in this process. Emerging micro- and low-cost insurance schemes such as weather-indexed crop insurance may also assist poor men and women to cope. However, financial services need to be made more accessible to the poor and especially to women, through for example flexible repayment options.

Disaster risk reduction

Disaster risk reduction is an essential part of adaptation as the first line of defence against climate change impacts such as increased flooding and regular droughts^{iv}. Gender-responsive disaster planning and risk reduction measures, linked with long-term development planning, can ensure that women and men are better able to respond to and recover from extreme events. For example, raising the plinth level of houses, building community shelters, and protecting seed and livestock can enhance women and men's ability to cope with flooding events. Appropriate sanitation facilities, such as elevated latrine units reduce fecal contamination of water resources, thereby reducing disease. They also provide safe and secure spaces for women to meet sanitary and hygiene needs with dignity. Appropriate and accessible early storm or flood warning mechanisms that consider gender differentiated access to technologies (such as cell phones) and information can enable women and men to move in time to safe locations. Stronger linkages between disaster risk reduction experience and tools and adaptation planning from local to international levels can help build resilience of women and men to climate variability. Similarly, adaptation efforts, and attention to the shifting hazard burden of longer-term changes in climate strategies should inform the disaster risk reduction community^{xv}.

Disaster management planning

Gender-sensitive disaster management planning saved lives of women, men and children in La Masica, Honduras. There were no reported fatalities after Hurricane Mitch because a disaster agency had provided gender-sensitive training and involved women and men equally in hazard management activities, and women took over control over the early warning system. This led to a quick evacuation when the hurricane struckⁱⁱⁱ.

Recommendations for policy and practice

Adaptation strategies need to be strengthened and reinforced by enabling policy and practice. Future efforts are needed to:

- * Strengthen capacity at the local level for women and men to understand differential climate change direct and indirect impacts, priorities and adaptation strategies. This will help ensure vulnerability reduction measures target women and men's diverse concerns.
- * Strengthen equitable participation of gender-sensitive women and men in adaptation decision-making platforms at multiple levels. Adaptation programmes and projects must be developed bottom up, and the voices and priorities of vulnerable women and men need to be heard and addressed. Meaningful participation in decision-making on climate change responses ensure that climate change policy and interventions respond to specific needs of women and men. It can also help raise the profile and status of women and girls in communities, and challenge traditional assumptions about their capabilities.ⁱⁱⁱ
- * Promote gender-sensitive technologies and practices, and gender-inclusive institutions for water management, agricultural and livestock production, and alternative energy that promote equity and efficiency.
- * Increase access of the poor—and of women—to extension information and services, credit and financial services, training and skills development programmes. Access to these resources can support diversification into less climate-sensitive incomes and enhance livelihood security.
- * Facilitate linkages between gender-responsive disaster risk reduction and adaptation planning from local to international levels.
- * Develop and apply gender-sensitive criteria and indicators in UNFCCC mechanisms and instruments, and national policies and action plans (including NAPAs). Effective and accountable monitoring and evaluation of adaptation and mitigation financing mechanisms at national and international levels are necessary to ensure that women and men's diverse priorities are met.

For more information see:
GenderCC – Women For Climate Justice (<http://www.gendercc.net/>)
Gender and Water Alliance (<http://www.genderandwater.org/>)

ⁱIntergovernmental Panel on Climate Change (2007). *Climate Change 2007: Synthesis Report. Contribution of Working groups I, II, and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Geneva: IPCC.

ⁱⁱUNDP (2007). *Human Development Report 2007/2008. Fighting Climate Change: Human Solidarity in a Divided World*. New York: UNDP.

ⁱⁱⁱBrody, A., Demetriades, J. and Esplen, E. (2008). *Gender and Climate Change: mapping the linkages. A scoping study on knowledge and gaps*. Sussex: BRIDGE, Institute of Development Studies.

^{iv}<http://www.gendercc.net>

^vFor an overview about activities and entry points aiming to integrate gender in the UNFCCC and related processes, see Röhr, U. & Hemmati, M. 2008. *Solidarity in the Greenhouse: Gender Equality and Climate Change*, in: Grover, V. (ed.): *Global Warming and Climate Change. Ten Years After Kyoto and Still Counting*, pp779-804, and pp1079-1083. Enfield (NH), USA: Science Publishers

^{vi}Mitchell, T., Tanner, T. and Lussier K. (2007). "We Know What We Need!": *South Asian Women Speak out on Climate Change Adaptation*, London: Action Aid International and IDS, Sussex.

^{vii}Moench, M. and the Risk to Resilience Study Team (2008). *Understanding the Costs and Benefits of Disaster Risk Reduction under Changing Climatic Conditions. From Risk to Resilience Working Paper No. 9*, eds. M. Moench, E. Caspari and A. Pokhrel. Kathmandu: ISET, ISET-Nepal and ProVenton. (Available at: www.i-s-e-t.org)

^{viii}Asian Development Bank et al. (2007). *Poverty and Climate Change: Reducing the Vulnerability of the Poor through Adaptation*. Manila: ADB.

^{ix}For further resources on psychosocial impacts of disaster please see the website of UN Habitat: <http://www.unhabitat.org/categories.asp?catid=283>

^x<http://www.searnet.org/searnetfinal/kusa.asp>

^{xi}MECTAT (2008). *Greywater Treatment and Reuse for Water and Food Security. Technical Report*.

^{xii}Williams, A. (2002). *Incorporating a Gender Perspective in Rural Water and Sanitation Projects. Experience of MUDE (Women in Development, Dominican Republic)*. Case study supported by Gender and Water Alliance. <http://www.genderandwater.org/page/5009>

^{xiii}Moench, M. and Dixit, A. (eds) (2004). *Adaptive Capacity and Livelihood Resilience: Adaptive Strategies for Responding to Floods and Droughts in South Asia*. Boulder: Institute for Social and Environmental Transition; Kathmandu: ISET-Nepal

^{xiv}Mitchell, T. and van Aalst, M. (2008) *Disaster risk reduction and climate change adaptation: Closing the gap*. Id21 Highlights Climate Change. December 2008. UK: IDS.

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Gender, Water and Climate Change

Climate change is a reality, and poses a serious long term threat to society and to the environment. Scientists have generated significant evidence that the use of fossil fuels, deforestation, and changes in land use have led to an increase in greenhouse gases (GHGs) in the atmosphere, causing the Earth's surface temperature to rise. This has already and will continue to result in changing rainfall patterns: heat waves; melting of glaciers; increases in frequency and magnitude of extreme weather events such as storms, floods and droughts; and rising sea levelsⁱ. These climate-related events—compounded by poverty, environmental degradation, and inadequate disaster management—have profound impacts particularly on poor women, men and children who may have less capacity, skills and resources to adapt.

Water—the basis for human life—is particularly threatened by climate change. With rising temperatures, changes in runoff patterns and increased water evaporation, climate change will greatly affect the distribution of the world's water and the timing of flowsⁱⁱ. It is estimated that by 2025, almost two-thirds of the world's population are likely to experience some kind of water stress, and for one billion of them the shortage will be severe and socially disruptiveⁱⁱⁱ. Water-related challenges arising from climate change include:

- Decrease in water availability and deteriorating water quality will reduce access to drinking water and negatively affect the health of the poor.
- Shifts in rainfall patterns and growing seasons, escalating floods and droughts, reduced soil moisture and fertility combined with land use degradation will result in decreased agricultural and livestock production and food insecurity.
- Increases in storms and flooding will lead to loss of lives and infrastructure; loss of property and assets including crops, livestock and seeds; and spreading disease.
- Accelerated glacial melt, decreasing run-off and changes in hydrological flow will affect crop production and fisheries as well as energy production dependent on hydropower systems, potentially exacerbating cross-boundary tensions. Seven major river systems of Asia that provide and sustain food supplies for over 2 billion people will be affected^{iv}.
- Rising sea levels will directly threaten the livelihoods of millions of people living in low-lying coastal areas, with increased flooding, coastal erosion, and seawater intrusion.



Such challenges of climate change are not gender neutral. Women and men have different vulnerability and capacity to adapt to climate impacts due to differing roles, opportunities, and access to resources. And it is women making up 70% of the world's poor who are often the most vulnerable to climate change. They are hindered by discriminatory social practices, diverse work responsibilities that may augment their exposure to climate hazards, and less access or rights to financial and productive resources, information and services that may help them cope with impacts. Despite this, women will play a significant role in supporting households and communities to adapt to and mitigate climate change through labour, natural resource management, provisioning of food and water. However, women are seldom involved in decision-making processes related to water or other resource use, or in short or long-term planning for climate change. As a result their concerns are less likely to be addressed in relevant policies.

Mitigation policies and practice are also gendered. Since the energy sector counts for 60% of total greenhouse gas emissions worldwide^v, mitigation efforts concentrate on 'greening' energy production and consumption, in addition to addressing the other main causes of emissions by reducing deforestation and land degradation. Energy production will also be a key factor for economic development and poverty alleviation. However, few policies or political decision-making processes consider that energy use—whether at household or industry levels—differs among women and men, as does access to energy efficient technologies. Nor do these policies consider how roles and

Adaptation aims to reduce vulnerability and improve resilience of people to climate change. It is the strategies and actions that different people take in response to, or in anticipation of, climate change to adjust to and cope with impacts, moderate damages, and take advantage of opportunities.

Mitigation is the reduction of emissions of greenhouse gases, for example from fossil fuels or deforestation, with a view to decrease or at least stabilize current GHG concentration in the atmosphere.

relationships of women and men are critical for REDD (Reducing Emissions through Deforestation and Degradation) programmes. As a result, women and men's differential concerns are not considered in mitigation efforts, potentially limiting their effectiveness and creating inequities in access to energy, new technologies, and benefits of climate change financing.

Despite the critical importance of gender in effective adaptation to and mitigation of climate change, gender issues continue to receive minimal attention in UNFCCC processes dealing with international policy responses on climate change^v and in national level strategies.

Gender, water and climate change: key challenges

Water scarcity and drought

Water sustains human life, agricultural and livestock production, and industry. Increase in drought, greater evaporation, and changes in rainfall patterns and run-off will reduce water availability, particularly in already water-scarce areasⁱ. These stresses will be superimposed on wider pressures on water systems



such as desertification and groundwater extraction. Over 130 million people already are exposed to droughtsⁱⁱ and the repeated shocks of multiple or sequential drought events sink many households deeper into poverty. Declining water availability will strain agricultural and livestock production already hindered by land degradation and price shocks. This will result in food and economic insecurity of women and men especially in areas dominated by rainfed production, with as much as 50% reduction of yield from rainfed agriculture in Sub-Saharan Africa by 2020¹. Decline of the agriculture sector will particularly affect women who are responsible for approximately 75% of household food production in Sub-Saharan Africa, 65% in Asia and 45% in Latin America^{vi}. Young girls and women risk greater malnourishment in societies and families that may privilege limited food resources to male members of households. Responsible for providing water for their families, increasing water scarcity will also increase the burden on women and girls who will have to spend more time and effort to carry, store and purify water. It may also lead to more economic hardship as families, particularly in urban areas, increasingly rely on private water sources.

Flooding

Changes in rainfall patterns and increases in extreme weather events such as cyclones and storms lead to flooding and landslides causing death, injury, and significant losses of property. Already, over 521 million people are exposed to floods and 344 million to tropical cyclonesⁱⁱ. While flooding in some areas like the Ganga Basin, are regular events providing vital water for irrigation and replenishing soil fertility, the frequency, timing, intensity and duration of flood hazards is changing^{vi}. Often the extent of flooding is intensified due to poorly maintained embankments and structural measures, and in urban areas poor land use planning and inadequate drainage^{vii}. In addition to destruction of homes and infrastructure, and loss of crops, livestock and seed, flooding will also inundate land, decrease soil fertility and destroy fodder resources, limiting agricultural production. Transport and communication linkages may also be compromised. Women face additional challenges collecting water and cleaning and maintaining houses after flooding.

Women and men face differential risk to extreme climate events and flooding. In the devastating cyclone and flood of 1991 in Bangladesh, the death rate was reportedly five times higher among womenⁱⁱ. This was due to cultural norms inhibiting women's movement without a man present, women not having learned how to swim, and women's lack of access to early warning information. Men and boys may place themselves at higher risk trying to conduct "heroic acts", as it was reported in the case of Hurricane Mitch that hit Honduras in 1998ⁱⁱⁱ. Women and girls are more likely

to become victims of domestic and sexual violence after a disaster or in areas of conflict-induced migration, particularly when families have been displaced and are living in overcrowded emergency or transitional housing where they lack privacy.

Health and disease

Climate change-induced droughts, flooding and extreme weather events degrade and reduce potable water supplies and increase water-associated disease such as cholera and diarrhoea, particularly in areas with inadequate sanitation^{viii}. Flooding and waterlogging may also serve as breeding grounds for vectors for diseases such as malaria and dengue. At present, diseases caused by inadequate access to safe drinking water and sanitation already kill an estimated 2.213 million people per year in developing countries, of which 90% are children under the age of five^{viii}. Women and girls are particularly exposed to water-associated diseases through responsibilities of washing and water collection. Gender discrimination in allocation of medicines and access to health services may place women and girls further at risk. Furthermore, women often are the main caregivers for family members suffering from disease and illness.

Access to resources

Access to water frequently is linked to land rights, and in many parts of the world, women's right to own or inherit land is prohibited or restricted. In areas of high male-migration, female-headed households are particularly vulnerable since women must assume traditionally male responsibilities of farm management without having access to necessary resources such as credit and extension services, or participating in governance institutions, such as water user associations.

In contexts of drought and floods, traditional risk sharing and risk-coping mechanisms like reliance on kin and social networks are not adequate if entire areas are affected. Poor women and men are often forced to sell assets such as land and livestock—or even their children as bonded labour or trafficking—pushing them further into impoverishment. Women, without land as collateral, are often inhibited from accessing credit facilities and forced to rely on moneylenders charging exorbitant rates of interest. Loss of assets, an inability to provide for their families, and relocation to safe grounds away from their homes and familial ties, leads to severe psychosocial impacts on women and men, hindering their capacities to cope^{ix}.

Governance

Governance and decision-making processes for adaptation and disaster management affect the capacity of women and men to cope with and mitigate climate impacts. Limited planning and weak institutional responses—for example, inadequate early warning systems and provision of health services—can magnify the adverse impacts of water-related disasters such as floods. Furthermore there is often a disjuncture between national level plans and policies and local level realities, resulting in a lack of relevance and applicability of adaptation plans at the local level. Participation in decision-making processes for adaptation and disaster management—whether at community, national or international levels—is generally unequal for women and men. As a result, gender specific priorities and concerns may not be included in short and long-term decision making on adaptation climate change.

Adaptation Strategies

As active agents of change, women and men have been developing innovative strategies to adapt to climate variability, and enhance their resilience to climate change and associated impacts. Most attention to adaptation to date has focused on technological interventions for water conservation, agricultural practices, and infrastructure design, rather than on institutional or procedural innovations that may reduce vulnerability. National and local adaptation strategies need to build on and enable local knowledge and efforts, and strengthen underlying systems to support capacities of women and men to adapt.

Improving water management and sustainability

Investment in integrated water supply and demand management that takes into account gendered roles and responsibilities for water management is critical to

enhance the sustainability of water resources. Community based efforts for rainwater harvesting for household use and to recharge aquifers can augment water supply and storage in areas of increasing groundwater extraction and rainfall variability.

Rainwater harvesting

In Kusa village in the Nyando District of Kenya's Lake Victoria Basin, the village government worked with women's groups to construct domestic rainwater harvesting units, and develop springs, shallow wells, earth dams and sand dams. This project was supported by the Regional Land Management Unit (RELMA) of ICRAF, and tanks were provided with subsidies and revolving credit. With assured supply of domestic water at the homestead, women's lives changed dramatically. Labour, time, and harassment experienced in collecting water was dramatically reduced^x.



Some adaptation efforts to increase accessibility of water in drought conditions may also serve as mitigation efforts when alternative energy sources (other than fossil fuels) are used, as described below.

Adaptation-mitigation efforts for water access

The most critical impacts of drought are decreased availability of drinking water (for both people and livestock), inadequate fodder and food insecurity. In Gujarat, India the Kutch Abhyian network is supporting women and men in 30 villages to enhance their resilience to drought. Under this programme, Dador village was able to address its water problem by recharging and lifting/pumping water from an old well using solar energy panels. In order to maintain a continuous flow of water in the main well, small check dams for water harvesting have been constructed. The water is used mostly by women for domestic purposes and for livestock. While these technologies can enhance resilience to decreasing water availability, costs of alternative energy sources generally remain high limiting replication elsewhere.



In urban areas, buildings equipped with rainwater harvesting structures, as well as recycling of wastewater can augment water supply, and even reduce environmental degradation.

Recycling Wastewater

In West Bekka, Lebanon, water is already an extremely scarce resource and wastewater is generally left untreated, contaminating soil and groundwater. With support from the Middle East Centre for the Transfer of Appropriate Technology (MECTAT) and the International Development Research Centre (IDRC), women in six urban communities are treating and recycling greywater for domestic use and in home gardens. Women's time spent for water collection diminished and vegetables grown were both used the household consumption and sold at the market generating income^{xi}.

Water demand management practices that decrease the amount of water required (such as cultivating less water intensive crops and using water efficient technologies like drip irrigation) and reduce the loss in quality of quantity of water as it flows from source through use to disposal (such as maintenance of irrigation channels) are as critical as strategies to augment supply, particularly in light of projected climate impacts.

Improved governance processes are needed. Decentralized participatory water management institutions such as water users associations can facilitate more equitable decision-making about resource use, enhance management and maintenance of irrigation channels and ponds, and facilitate access to water-saving technologies thereby improving the efficiency of water management systems. However, these institutions need to be more representative of women and inclusive of their priorities and needs.

Integrating women's and men's priorities in water management

On the island of Hispaniola, Dominican Republic, over 75% rural communities do not have access to piped drinking water, and women spend significant time obtaining water for family use and household agriculture. 42% of freshwater is used for irrigation and food production, which in turn generates income, but in negotiations to the rights of water and irrigated land, women, and even poor male farmers, are often excluded. MUDE (Women in Development, DR) initiated a project to support community water-management committees, with a minimum of 40% representation of women. Members were trained in democratic decision-making, community participation and gender analysis. Some committees have now prioritized drinking water and household use in water distribution planning^{xii}.

Strengthening agricultural and livestock production

In Cambodia, men and women farmers are responding to increasingly unpredictable rainfall by dividing their rice plots: on one half, using conventional wet-paddy rice techniques which are resistant to heavy rainfall, and on the other half, applying a system of rice intensification requiring much less water.^{xiii} Women and men are strengthening agricultural production systems to be more resilient to climate variability through growing different crops, cultivating drought-tolerant, water-resistant and saline tolerant crop and fodder varieties, planting early or late sowing varieties. They are also employing water efficient management for agriculture such as drip irrigation and treadle pumps.

But crop diversification and adapted agricultural and livestock practices often require information and skill training about planting; suitability of varieties; proper use of manure, pesticides and irrigation; post-harvest methods; and improved animal husbandry. Poor populations, and particularly women, often have limited access to extension services for needed inputs and information. They may also lack credit and financial resources, and appropriate links to markets, necessary for investment in new crops and products. In most countries, specific efforts need to be made to ensure that women are included in developing platforms and processes of learning and exchange towards improved and more resilient agricultural production (see, for example: www.ecoagriculturepartners.org).

Diversified livelihoods and migration

Many poor rural women and men are responding to environmental and economic hardship through diversifying their livelihoods to non-farm labour. This diversification can enhance their resilience as evidenced in India where middle-income families solely dependent on farm incomes were more vulnerable to drought than poorer families that had already diversified their sources of income^{xiii}. Those with skills and social networks may migrate to urban or peri-urban centres seeking alternative employment, and many families throughout the world have at least one family member sending remittances.

However, change of livelihoods requires skills, and women, generally with less education and access to skills or training, and more limited mobility than men, may not be able to obtain non-farm work, or end up working in low-skilled jobs with low wages. Most of this employment is in the informal sector with limited social protection and harsh working conditions. While migration may ultimately strengthen adaptive capacity for families "at home", it also exposes migrants to new social vulnerabilities.

In Banke and Bardiya districts of Nepal, a study by Action Aid and IDS documented that women farmers are changing cultivation to flood and drought resistant crops, growing crops that can be harvested before the flood season, altering cropping patterns, diversifying to fish farming in areas of high flooding, and investing in alternative irrigation facilities—but finance has remained a barrier for many to use these technologies.^{vi}